

THE PALAEARCTIC  
CHRYSOMELIDAE





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**THE PALAEARCTIC  
CHRYSOMELIDAE**

Identification keys

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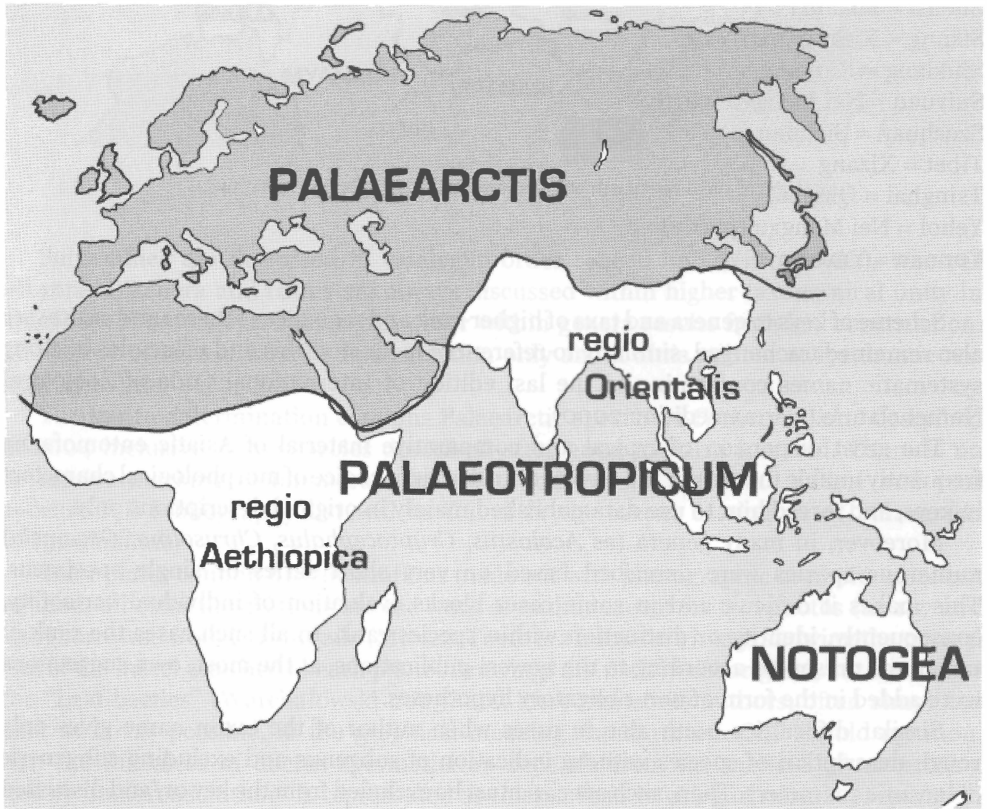
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## INTRODUCTION

The present work is a key for determination of leaf beetles occurring in the Palaearctic area. It is based on my previous work (Warchałowski 2003), enriched by Asia territory excluding those area which traditionally are included into Oriental area (Pakistan, Transhimalayan countries, India, S China, Indochina, Ryukyu Is. and Taiwan). The limits of the Palaearctic area are approximately agreed according to Wallace (1876). Consequently, as Palaearctic (see the map) were considered species occurring in Canarian Islands, Africa north of Sahara, Near East, Arabian Peninsula, Iran, Afghanistan, N China (to the provinces Xinjiang, Qinghai, Gansu, Shaanxi, Shansi, Hebei and Shandong inclusive), Japan without Ryukyu Islands and all remaining Eurasian territories north of this area. Species of the subfamilies *Galerucinae* and *Alticinae* occurring in the Chinese province Xizang are partly included in the keys.

## THE DISCUSSED AREA

The provinces names of China are differently transcribed. In this work are mostly applied names after Gressitt and Kimoto (1961); corresponding or partly corresponding recent official names are also listed below:



Anhwei = Anhui  
Chahar = Nei Menggu (partly)  
Chekiang = Zhejiang  
Fukien = Fujian  
Hainan = Hainan  
Heilungkiang = Heilongjiang  
Honan = Henan  
Hopeh = Hebei  
Hunan = Hunan  
Hupeh = Hubei  
Kansu = Gansu  
Kiangsu = Jiangsu  
Kiangsi = Jiangxi  
Kirin = Jilin  
Kwangsi = Guangxi  
Kwantung = Guandong  
Kweichow = Guizhou  
Liaoning = Liaoning  
Ningsia = Gansu (partly)  
Shansi = Shaanxi  
Shantung = Shandong  
Shensi = Shaanxi  
Sikang = Xizang (partly)  
Sinkiang = Xinjiang  
Suiyuan = Nei Menggu (partly)  
Szechuan = Sichuan  
Tibet = Xizang  
Tsinghai = Qinghai  
Yehol = Nei Menggu (partly)  
Yunnan = Yunnan

Scheme of keys to genera and taxa of higher rank and sequence of theses and antitheses also remained unchanged, similarly to references to illustrations and principles of citing systematic names conforming to the last edition of International Code of Zoological Nomenclature (German edition 2000).

The great dispersion of typical and comparative material of Asiatic entomofauna frequently unable the author the direct control of right choice of morphological characters in keys, and forced him to use data published mainly in original descriptions only.

Moreover, in many genera (as *Acolastus*, *Cryptocephalus*, *Chrysolina*, *Oreomela*) numerous species were described based on very short series or single specimens. This makes it difficult and in some cases blocks evaluation of individual variability, consequently, identity or distinction within species rank. In all such cases the rank of taxon was preserved according to the newest publications, at the most, own suggestions were added in the form of non-obligatory hypotheses.

Similar difficulties occur also in cases when author of the taxon name gives only rough description of species without indication of subgenus and excluding subgeneric diagnostic characters. Then, such species must be excluded from the key or/and discussed separately.



*Countries and provinces belonging to the discussed area in SE Asia*

Subfamilies are discussed in catalogue order (Seeno and Wilcox 1982), whereas subgenera, genera and tribus are always discussed within higher taxonomical unity in alphabetical order, only the species order within genera results from key construction. The layout of keys is used to determination only and it aims neither at systematic nor catalogue order of species.

The key to determination contains Palearctic species of *Chrysomelidae* described to 2004 inclusive, some species described after 2004 are also inserted. There is no successive marking of bibliographical quotations within the same author and year because full bibliography list will be found in the recent catalogues of palearctic *Chrysomelidae*.

Color plates contain 918 illustrations made out with photographic or photo-scanning method; all color illustrations are the work of author except for two photos (nr 187 and 230) borrowed from K. Dowgailo (Minsk). There is a miniature image showing the natural size of the insect attached to each photo. Drawings are mainly not original, but cited after the "Leaf-beetles" (Warchałowski 2003) and after numerous authors, often simplified and, as far as possible, in the graphical meaning standardized. One should mention, that the thickness of ductus spermathecae depends from the method of macerating and by numerous authors is represented as thicker than in using of normal preparation techniques.

I would like to express my thanks to the numerous colleagues and friends who supplied me with help and advice while writing this book, particular to professor I. K. Lopatin (Minsk, Belarus), dr. Horst Kippenberg (Herzogenaurach, Germany) and Mr Manfred Döberl (Abensberg, Germany). Special thanks go to prof. Lech Borowiec (Wrocław, Poland) for his invaluable help with the cassidine identification key.

## IDENTIFICATION KEYS

### Key to subfamilies

1. Vertex projecting forward, mouth directed obliquely backwards and downwards (opistognath), body usually laterally flattened or covered by spines ..... **Cassidinae** (p. 1025).
- . Head normal, mouth directed obliquely forward and downward (prognath) or downwards (hypognath), body without spines, usually convex ..... **2.**
2. Head narrowed posteriorly, pronotum considerably narrower than elytron, pronotal sides not margined ..... **3.**
- . Head not narrowed posteriorly, pronotum broad, pronotal sides usually margined .... **9.**
3. Antennal insertions approximate ..... **Donaciinae** (p. 8).
- . Antennal insertions separated by width of frons ..... **4.**
4. Posterior femur strongly swollen ..... **5.**
- . Posterior femur not swollen, body not covered with long, erect hairs ..... **6.**
5. Usually large insects (8–25 mm), dark metallic coloured, upper side bare, antennae long ..... **Sagrinae** (p. 7).
- . Body covered with long, erect hairs. Antenna short, barely reaching beyond humerus, distal segments generally broader than long, more or less dentate ..... **Megalopodinae** (p. 29).
6. Tarsal claws generally bifid or toothed internally; pronotum often toothed laterally ..... **7.**
- . Tarsal claws simple, sometimes coalescent, pronotum never toothed laterally .... **Criocerinae** (p. 31).
7. Side of pronotum with a prominent swelling or with 2–3 distinct teeth ..... **8.**
- . Side of pronotum evenly rounded; body rather narrow, elongate ..... **Orsodacninae** (p. 24).
8. Side of pronotum with a prominent swelling anterior to constricted base; body not flattened ..... **Zeugophorinae** (p. 26).
- . Side of pronotum with 2–3 sharp teeth; body flattened ..... **Synetinae** (p. 375).
9. Form of body subcylindrical. Pygidium great, slope; middle 3 abdominal sternites narrow, often constricted in central portion ..... **10.**
- . Form of body more or less ovate or rounded, not subcylindrical. Pygidium generally flattened, middle 3 abdominal sternites never constricted ..... **11.**
10. Antenna serrate, shorter than half of body length ..... **Clytrinae** (p. 47).
- . Antenna filiform, usually longer than half of body length ..... **Cryptocephalinae** (p. 147).
11. Antennae closely inserted on front of head ..... **12.**
- . Antennae not closely inserted, separated by frons ..... **13.**
12. Posterior femur swollen, adapting for jumping ..... **Alticinae** (p. 723).
- . Posterior femur not swollen ..... **Galerucinae** (p. 630).
13. Underside of prothorax grooved for reception of antenna, abdomen grooved for reception of hind legs. Body oviform, convex ..... **Lamprosomatinae** (p. 373).
- . Underside of prothorax and abdomen not grooved ..... **14.**

- 14. Third tarsal segment deeply bilobed. Prothorax generally narrower than elytra basally ..... ***Eumolpinae*** (p. 376).
- . Third tarsal segment not bilobed, entire or moderately emarginate. Prothorax generally as broad as elytra basally ..... ***Chrysomelinae*** (p. 421).



## Subfamily *Sagrinae*

Subfamily *Sagrinae* contains about 15 genera and about 100 species, distributed almost exclusively in Palaeotropic superarea and Australia. A few species belonging to the genus *Sagra* encroach on eastern part of Palaearctic area.

### Genus *Sagra* FABRICIUS, 1792

Usually large insects (15–25 mm), dark metallic coloured. Hind femora strongly thickened, tibiae often bent. The largest genus in subfamily, containing about 60 species. In Palaearctic area represented by two subgenera only.

#### Key to subgenera

1. Pronotal puncturation extremely fine or obsolete. Longitudinal groove below anterior prothoracic tubercle present ..... ***Sagra*** s. str. (p. 7).
- . Pronotal puncturation moderately strong, punctures about as large as eye facets. Longitudinal groove below anterior prothoracic tubercle absent ..... ***Prosagra*** (p. 7).

### Subgenus *Sagra* s. str.

#### Key to species

1. In male preapical tooth of hind femur bifid, hind tibia with distinct preapical tooth. Length 16.0–20.0 mm (= *purpurea* LICHTENSTEIN, 1796, *splendida* OLIVIER, 1807, *jeanvoinei* PIC, 1953). Forms three differently coloured subspecies, distributed in India, Indonesia, Indochina and southern China. Subspecies *femorata* s. str. occurs also in Sichuan ..... ***femorata*** (DRURY, 1773).
- . In male preapical tooth of hind femur trifid, preapical tooth of hind tibia weak or absent. Length about 18.0 mm (= *ignita* LACORDAIRE, 1845, *formosa* LACORDAIRE, 1845, *heterodera* LACORDAIRE, 1845). Distributed in Vietnam and S China, also in Sichuan ..... ***tridentata*** WEBER, 1801.

### Subgenus *Prosagra* CROWSON, 1946

In discussed area one species only. General view as in plate I, **phot. 1**. Forms two subspecies, distributed in Burma, Thailand and S China: body violaceous or bluish, elytra golden or reddish cupreous with lateral margins and sutural stripe greenish (*fulgida* s. str.); body unicolorous, violaceous blue, sometimes with greenish reflections (subsp. *janthina* CHEN, 1942). Length 7.5–15.0 mm. The both subspecies occur also in N Sichuan ..... ***fulgida*** WEBER, 1801.

## Subfamily *Donaciinae*

### Key to genera

1. Tarsus slender, with tarsomere 3 small, unlobed (the unique exception in the family *Chrysomelidae*), elytron with outer apical angle prolonged as spine, segment 5 very long, as long as three basal segments together ..... ***Macrolepa*** (p. 19).
- . Tarsus broad, tarsomere 3 bilobed, segment 5 not very long, at most twice as long as 3 ..... **2.**
2. Elytron with outer apical angle prolonged as spine ..... ***Neohaemonia*** (p. 20).
- . Elytron without apical spine ..... **3.**
3. Hind tibia with an obtuse tooth or thickening internally; in male hind femur with a tubercle or ridge beneath ..... ***Sominella*** (p. 23).
- . Hind tibia with an obtuse tooth or thickening internally ..... **4.**
4. Elytron with inner bead of sutural interval sinuate distinctly before apex, explanate sutural margin below exposed (tribe *Plateumarini*). Legs stout. Abdominal segment 1 as long as following combined. Elytral suture in apical quarter oblique ... ..... ***Plateumaris*** (p. 20).
- . Elytron with inner bead of sutural interval not sinuate before apex, interval more or less uniformly wide to near apex, explanate margin not broadly exposed (tribe *Donaciini*). Legs slender. Abdominal segment 1 longer than following combined .... **5.**
5. Pronotum and elytra uniformly pubescent ..... **6.**
- . Elytra not pubescent, sometimes scarcely covered with short hairs ..... **7.**
6. Mandible apically distinctly and broadly bidentate ..... ***Donaciella*** (part) (p. 18).
- . Mandible unidentate. Body yellow, head, a great part of pronotum, metasternum and tarsi blackish. Length 7.0–8.3 mm (= *testaceipes* PIC, 1908). Asia Minor, Mesopotamia, Iran ..... ***Donacia microcephala*** DANIEL et DANIEL.<sup>1</sup>
7. Epipleuron of elytra flat or slightly rounded from behind humerus to near apex; dorsum pale metallic green or bronzy ..... ***Donaciella*** (part) (p. 18).
- . Epipleuron of elytra angulate from behind humerus to near apex; dorsum variously coloured ..... ***Donacia*** (p. 18).

### Genus *Donacia* FABRICIUS, 1775

Not included *D. kweilina* CHEN, 1966, an insufficiently characterized species, after description never mentioned in the literature.

### Key to subgenera

The subgenera are often treated as simple synonyms of *Donacia*.

1. Lateral calli of pronotum sharpened, almost dentiform. Antennomere 3 longer than the first. Apical part of elytron not truncate, but narrowed and sharpened ..... ***Askevoldia*** (p. 9).
- . Lateral calli of pronotum gently convex. Antennomere 3 shorter than the first .... **2.**
2. In male first abdominal sternite with a pair of slender spine-like tubercles near center. E Palearctic forms only ..... ***Cyphogaster*** (p. 9).

<sup>1</sup> Generic assignment undecided, probably a separate genus.

- In male first abdominal sternite without spine-like tubercles ..... **3.**
- 3. Process of mesostrenum approximately as broad as diameter of coxa .....  
..... *Donacia* s. str. (p. 10).
- Process of mesosternum much narrower than diameter of coxa ..... **4.**
- 4. Process of mesosternum about 1/3 as broad as diameter of coxa. Elytra relatively  
broad and flattened, their apex rounded. Hind femora long, without tooth  
REITTER, 1920, here (after ASKEVOLD 1990) discussed as a distinct genus .....  
..... *Donaciella* (p. 18)
- Process of mesosternum broader than 1/3 of diameter of coxa. Elytra apically more  
or less distinctly truncate. Hind femora usually shorter, with one or two teeth on  
inner side ..... *Donaciomima* (p. 10).

Subgenus *Askevoldia* KIPPENBERG, 1994

One species only. Pronotum constricted posteriorly, its anterior angles and tubercles sharp-pointed. Upper side normally cupreous or purplish-bronzy, rarely bluish (ab. *coerulans* SHAVROV, 1948). General view as in plate I, **phot. 2**. Length 8.0–11.0 mm. On *Sparanium ramosum* L. Distributed in SW Europa an NW Africa .....  
..... *reticulata* GYLLENHAL, 1817.

Subgenus *Cyphogaster* GOECKE, 1934

Key to species

1. Antennomeres 3 and 2 subequal; tubercles at antennal insertions weakly developed. Upper side with metallic sheen, variously coloured, greenish, violaceous, bluish or cupreous. Antennae reddish brown, apical part of each segment blackish. Legs brown, most part of femora, apices of tibiae and entire tarsi bronzy black. Antennae relatively short. General view as in plate I, **phot. 3**. Length 6.0–8.0 mm (= *wiepkeni* WEISE, 1898, *formosana* CHŪJŌ, 1934). Distributed in E Siberia, China, Korea and Japan ..... *lenzi* SCHÖNFELDT, 1888.
- Antennomere 3 much longer than 2; tubercles at antennal insertions well-developed, convex ..... **2.**
2. On average larger. Truncate apex of elytra sharply pointed at both angles. Lateral sides of pronotum almost straight, pronotum in dorsal view rectangular. General view as in plate I, **phot. 4**. Colouring of body as in *lenzi* (thesis 1). Length 6.0–8.0 mm (= *brevicollis* WEISE, 1898, *nitidicollis* WEISE, 1898, *sikanga* GRESSIT, 1942, *yasai* NAKANE, 1954). Distributed in N China, Korea, E Siberia and Japan .....  
..... *provosti* FAIRMAIRE, 1885.
- On average smaller. Truncate apex of elytra obtusely rounded at both angles. Colouring of body as in *lenzi* (thesis 1). Length 5.5–6.5 mm. Distributed in Honshu .....  
..... *yusai* NAKANE, 1963.

## Subgenus *Donacia* s. str.

Subgenus *Donacia* s. str. contains three species.

### Key to species

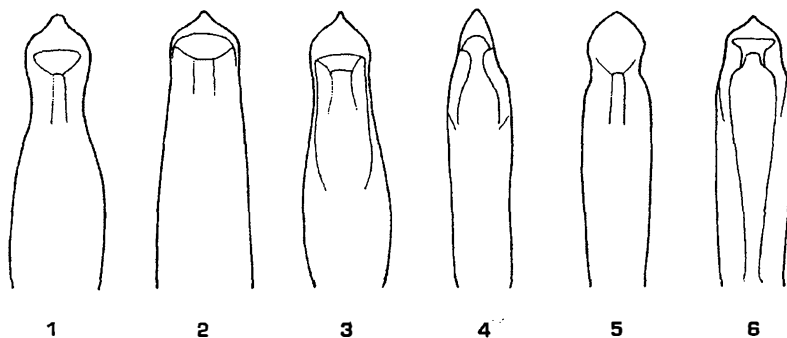
1. Body length under 8.0 mm ..... **2.**
- . Body length over 9.0 mm. Frontal furrow deep, eyes smaller and less convex. Pronotum short, not punctate, uniformly alutaceous. Body broad, flattened, hind legs very long. Upper side blackish, its metallic lustre cupreous, dark green or purplish-violaceous, rarely absent (ab. *anthracina* EVERTS, 1903). General view as in plate I, **phot. 5**. Length 9.3–12.0 mm (= *micans* HOPPE, 1795, *striata* PANZER, 1793, *spinosa* THOMSON, 1866). On swimming leaves of *Nuphar luteum* L. and *Nymphaea alba* L. Widely distributed from Ireland to eastern Siberia; in M and N Europe rather common, in S European countries rare ..... ***crassipes*** FABRICIUS, 1775.
2. Frontal furrow deep, general view very similar to *D. provosti* (subgenus *Cyphogaster*, thesis 2), but differing by subgeneric characters. Described from Hiroshima (W Honshu) ..... ***akiyamai*** KOMIYA, 2001.
- . Frontal furrow shallow, eyes large and convex, remaining characters as in *crassipes* (antithesis 1). Length about 7.0 mm. Distributed in basin of Amur ..... ***ussuriensis*** MEDVEDEV, 1973.

## Subgenus *Donaciomima* MEDVEDEV, 1973

### Key to species

1. Pronotum pubescent ..... **2.**
- . Pronotum not pubescent ..... **6.**
2. Species from Asia Minor and Caucasian countries ..... **3.**
- . E Palaearctic species ..... **4.**
3. Species from western Turkey (Amasya). Pronotum without lateral calli, its sides almost parallel, apices of elytrae narrowly rounded, body greenish-golden, underside cupreous. General view as in plate I, **phot. 6**. Length 9.5 mm. In male pronotum glabrous (see thesis 10), here female only ..... ***kraatzi*** WEISE, 1882.
- . Species from Armenia. Length 8.5–11.0 mm. Pronotum distinctly conical, narrowed anteriorly, apices of elytra somewhat indistinctly transversely cut. General view as in plate I, **phot. 7** ..... ***fastuosa*** KHNZORIAN, 1962.
4. Pronotum densely covered by fine hairs, hind femur in male with relatively strong, in female with distinct tooth ..... **5.**
- . Pronotum glabrous or almost glabrous, hind femur in male with weak tooth, in female unarmed. Prothorax as long as broad, without any transverse rugosities. Elytron with one depression near suture. Rather widely distributed in all China ..... ***frontalis*** JACOBY, 1893.
5. Antennae reddish brown with first antennomere cupreous, each of remaining antennomeres bicolorous, reddish with darkened apex. Legs cupreous with basal part of femora and basal half of tibiae reddish brown or brownish. Body blackish

- with cupreous sheen. Hind femora with relatively strong tooth. Length 7.5–9.0 mm (= *thoracica* LACORDAIRE, 1848, nec FISCHER, 1842, *fukiensis* GOECKE, 1944). Distributed in E Siberia, N China and Japan ..... ***clavareaui*** JACOBSON, 1906.
- . Antennae and legs entirely yellowish to reddish brown. Body cupreous. Length 6.5–9.2 mm. Distributed in Honshu ..... ***hirtihumeralis*** KOMIYA et KUBOTA, 1987.
6. Pronotum distinctly longer than broad. Similar to *antiqua* (antithesis 45), but legs longer. Upper side with cupreous sheen, legs brownish, fore tibia apically and tarsi darkened, apices of femora with greenish metallic reflex. Length about 8.0 mm. Described from N Iran ..... ***asiatica*** FALDERMANN, 1837.
- . Pronotum not distinctly longer than broad, usually subquadrate ..... 7.
7. Apex of elytron narrowed. Upper side strongly shining, dark green. Femoral tooth in hind legs variable, usually broad and large, sometimes broad but very short. Length 8.0–10.0 mm. Distributed in Transcaucasia ..... ***misthenkoi*** JACOBSON, 1910.
- . Apex of elytron rounded, obtuse or emarginate ..... 8.
8. Upper side without metallic lustre, testaceous or brown, unicolorous or with blackish stripes ..... 9.
- . Upper side with metallic lustre ..... 10.
9. Hind femur very long, reaching almost the apex of elytra. Tarsomeron 2 one and a half time as long as broad. Length 6.5–8.5 mm (= *ochroleuca* WEISE, 1912, *flavidula* REITTER, 1913). On *Phragmites* and *Glyceria*-species. Distributed in Fennoscandia and in Siberia ..... ***fennica*** PAYKULL, 1800.
- . Hind femur much shorter, normal. Tarsomeron 2 not longer than broad. Length 7.0–10.0 mm. Colour aberrations of *D. malinovskyi* (antithesis 22).



Figs 1-6. Tubular part of aedeagus in dorsal view (after WARCHAŁOWSKI 2003): 1 – *Donacia* (*Donaciomima*) *dentata*; 2 – *D. (D.) versicolorea*; 3 – *D. (D.) polita*; 4 – *D. (D.) vulgaris*; 5 – *D. (D.) malinovskyi*; 6 – *D. (D.) aquatica*.

10. Hind femur long, in male sometimes reaching beyond the apex of abdomen, in female almost to the apex ..... 11.
- . Hind femur much shorter, normal ..... 17.
11. Legs entirely black. See *D. aquatica*, (thesis 26), here also males of *kraatzi* (thesis 3).
- . Legs at least partly reddish brown ..... 12.

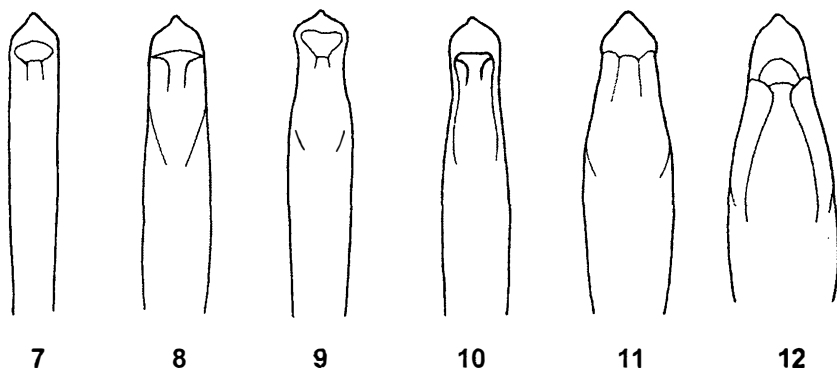
12. Punctures of elytron very fine, intervals 2, 3 and 4 broad and smooth. Length 8.0 mm. Till now one feminine specimen from Anatolia (Turkey) is known ..... *delagranei* PIC, 1896.
- Punctures of elytron rather strong, intervals 2, 3 and 4 not particularly broad and smooth ..... **13.**
13. Antennal segment 3 distinctly (at least 1.5 times) longer than 2. External angle of the apex of the elytron sharp and distinct. Body rather slender. Upper side unicolorous, metalliclustre cupreous, bronzy or bronzy-greenish. In male abdominal segment 1 with 2 tubercles. General view as in plate I, **phot. 8.** Length 7.5–11.0 mm (= *melanocephala* MARSHAM, 1802). Several variations: in male the tubercles on abdominal segment 1 absent (ab. *angustata* KUNZE, 1818), in female hind femur with 2 teeth (typical form), with 1 tooth (ab. *phellandrii* SAHLBERG, 1839) or without tooth (ab. *indentata* KOLOSSOV, 1925); upper side golden, cupreous or bronzy (typical form), greenish (ab. *chrysochlora* WESTHOFF, 1882), bluish or violaceous (ab. *autumnalis* WESTHOFF, 1882), black with a feeble violaceous reflex (ab. *diabolus* WESTHOFF, 1882). On *Sagittaria sagittifolia* L. and *Alisma plantagoaquatica* L. Distributed from Ireland and France to Altai ..... *dentata* HOPPE, 1795.
- Antennal segment 3 subequal to 2 or a few (less than 1.5 times) longer than 2. External angle of the apex of the elytron prominent, but rounded, not sharp ..... **14.**
14. Pronotum rather irregularly punctate and wrinkled ..... **15.**
- Pronotum uniformly punctate ..... **16.**
15. Length 7.0–10.0 mm. On elytra interstices without transverse wrinkles. Body relatively short, flattened, upper side dark coloured, usually blackish with a metallic reflex brighter along the sides of elytra, cupreous, greenish, rarely purplish violaceous. Hind femur in male with 2 teeth, in female with one only, which may be sometimes entirely reduced. General view as in plate I, **phot. 9.** Aedeagus as in fig. 2. Length 6.0–10.0 mm (= *bidens* OLIVIER, 1791, *cincta* GERMAR, 1810). Two variations were described: upper side shining, blackish, lateral stripe golden (ab. *suffriani* WESTHOFF, 1882), upper side dull, blackish, the lateral stripe feebly distinguished (ab. *lusatica* HÄNEL, 1911). On *Potamogeton natans* L. Distributed from W Spain and Ireland to western Siberia, reported also from Portugal ..... *versicolorea* (BRAHM, 1790).
- Length 5.0–6.0 mm. On elytra interstices with deep transverse wrinkles. Described from northern part of Iberian Peninsula ..... *galaica* BAGUENA, 1959.
16. A mediterranean species. Upper side usually unicolorous, cupreous or bronzy, shining. Elytral impressions very shallow or absent. General view as in plate II, **phot. 10.** Aedeagus as in fig. 3. Length 6.5–9.0 mm. Distributed in northern Africa, southern Europe and in Asia Minor ..... *polita* KUNZE, 1818.
- A species from NE Turkey. Elytron bicolorous, greenish-bronzy, with a median stripe blackish-purplish or very dark violaceous. On each elytron two impressions, rather shallow, but distinct. Length 8.0–8.5 mm. Perhaps an eastern race of *polita* (thesis 15) ..... *jacobsoni* SEMENOV et REICHARDT, 1927.
17. Legs at least partly pale (reddish, brownish, yellowish) ..... **18.**
- Legs entirely black or with metallic reflex, at most with dark reddish basis of femora or slightly paler joints ..... **25.**
18. Femora entirely black with metallic reflex, tibiae in basal part and tarsi reddish, last tarsomeron blackish. Outline of body as in *thalassina* (antithesis 42), hind femora with well developed tooth. Length 6.3–7.8 mm (= *semenovi* JACOBSON, 1899,

- rufovariegata* JACOBSON, 1901). Poorly known species, perhaps a form of *bactriana* (thesis 42) or *thalassina* (antithesis 42) and often considered as subspecies of *thalassina*. Distributed in Mongolia, E Siberia and N China ..... ***intermedia*** JACOBSON, 1899.
- . Femora at least partly reddish ..... **19.**
19. Elytral impressions absent. General outline of body as in *polita* (thesis 15). Antennal segments 2 and 3 subequal. Body convex, uperside generally cupreous or bronzy-greenish, the metallic lustre feeble, rather dull or silky. Length 8.0–8.6 mm. Only two feminine specimens from northern Caspian area known ..... ***aequidorsis*** JACOBSON, 1894.
- . Elytral impressions present. Antennal segment 3 distinctly longer than 2 ..... **20.**
20. Legs entirely pale. First antennomere and apical part of remaining antennomeres metallic. Length 7.8–9.0 mm (= *subcylindrica* CHEN, 1941). Distributed in China, Taiwan and Japan ..... ***bicoloricornis*** CHEN, 1941.
- . Femora largely blackish with cupreous sheen ..... **21.**
21. Antennae robust, preapical antennomeres about twice as long as thick. Apex of elytron truncate, its external angle blunt. Length 6.5–7.0 mm. Distributed in Honshu ..... ***nitidior*** NAKANE, 1963.
- . Antennae filiform, preapical antennomeres about three times as long as thick .... **22.**
22. Apex of elytron by both sides shallowly emarginate, its external angle sharp. Body slender. Upper side either unicolorous, dark bronzy, or golden-greenish, with intervals 2–6 cupreous. Aedeagus as in fig. 4. Length 6.0–9.0 mm (= *typhae* AHRENS, 1810). Three variations were described: unicolorous green (ab. *viridula* SAHLBERG, 1871), unicolorous golden or cupreous (ab. *concolor* WESTHOFF, 1882), antennae and legs almost entirely reddish or testaceous (ab. *issykensis* JACOBSON, 1900 from Middle Asia, treated often as subspecies). On *Typha latifolia* L. and *T. angustifolia* L. A transpalearctic species, distributed from The British Isles and Spain to Japan ... ***vulgaris*** ZSCHACH, 1788.
- . Apex of elytron not emarginate, its external angle obtuse or rounded. Upper side unicolorous, the metallic lustre usually feeble, a little dull ..... **23.**
23. Sculpture of upper side coarse, elytra shining, strongly punctate or puctured and deeply, transversely wrinkled, elytral impressions shallow or indistinct ..... **24.**
- . Sculpture of upper side rather fine, elytra often silky, usually with distinct impressions. Legs at least partially reddish brown. Pronotum finely and closely puctured. Elytron strongly punctate, but usually without deep, transverse wrinkles. Body slender. Upper side dark coloured, blackish with metallic greenish, bluish or violaceous reflex, exterior sides of elytra with a little stronger, golden-greenish sheen. General view as in plate II, **phot. 11**. Aedeagus as in fig. 5. Length 7.0–10.0 mm. Several colour variations were described: upper side entirely dark with metallic reflex (typical form), upper side brown, pronotum with a central metallic violaceous-blackish spot, each elytron along the middle with a metallic violaceous-blackish stripe (ab. *ladonensis* THIERRIAT, 1946), similar to ab. *ladonensis*, but the dark spot and stripes without metallic sheen (ab. *ararensis* THIERRIAT, 1946), upper side brown, pronotum with a dark central spot (ab. *mequignoni* THIERRIAT, 1946), upper side light-brown, on each elytron with a short brown stripe (ab. *caroli* THIERRIAT, 1946), upper side unicolorous light-brown (ab. *arundinis* AHRENS, 1810). On *Glyceria aquatica* L. Distributed in the northern part of Middle Europe, from France to basin of Volga ..... ***malinovskyi*** AHRENS, 1810.

24. Aedeagus in apical part gently narrowed and its apex rounded Length 7.0–9.0 mm (= *linearis* HOPPE, 1795). Several colour variations are known: upper side bronzy or bronzy-green (typical form), upper side cupreous (ab. *aurichalcea* WESTHOFF, 1882), upper side greenish (ab. *aeruginosa* WESTHOFF, 1882), upper side bluish or bluish-violaceous (ab. *pulcherrima* HUMMEL, 1829), upper side bluish-black (ab. *atrocoerulea* WESTHOFF, 1882), upper side purplish (ab. *sanguinea* WESTHOFF, 1882). Very widely distributed, from The British Isles and Spain to Mongolia and eastern Siberia ..... ***simplex*** FABRICIUS, 1775.
- . Aedeagus not studied. Pronotum finely punctate and obsolete rugose on submarginal areas, transverse corrugation covers lateral and apical areas only. Legs reddish brown with apical halves of femora greenish. Antenna bronzy green, basal part of each antennomere reddish. 7.5–10.0 mm. Distributed in Honshu ..... ***ozensis*** NAKANE, 1954.
25. Hind femur very thick, claviform, with a large tooth, in male high and anguliform, in female much lower and broad. Body entirely black with weak bluish reflex or black with aeneous reflex. Length 6.5–7.5 mm (= *jacobsoniana* SHAVROV, 1948). Distributed in E Siberia, Korea and NE China ..... ***flemola*** GOECKE, 1944.
- . Hind femur not conspicuously thickened, body not bluish black ..... **26.**
26. Hind femur long, in male reaching almost the apex of elytra ..... **27.**
- . Hind femur not very long, normal. First interval (close to suture) not impressed .... **28.**
27. First interval (close to suture) finely transversely wrinkled, silky, usually a little impressed. Upper side golden-greenish, each elytron with a broad, purplish or violaceous median stripe. Hind femur with a great and sharp tooth. General view as in plate II, **phot. 12**. Aedeagus as in fig. **6**. Length 6.0–10.0 mm (= *fasciata* HERBST, 1784, *coccineofasciata* HARRER, 1784, *vittata* OLIVIER, 1791, *dentipes* FABRICIUS, 1792, *latonae* GISTL, 1857). Variations: colouring as above (typical form), as above but pronotum bluish (ab. *cyanicollis* OLSUFJEV, 1903), upper side dark blue, suture and sides of elytra golden-green (ab. *valdaica* OLSUFJEV, 1903), upper side dark bluish-grey, stripes on elytra blackish-violaceous (unnamed), pronotum shorter as usually (ab. *concinna* WEISE, 1898, from Spain). Distributed from Spain and Ireland to Siberia and ?Japan ..... ***aquatica*** (LINNAEUS, 1758).
- . First interval (close to suture) not finely transversely wrinkled. Upper side dark with dark red metallic reflex. Hind femora without tooth. Length about 10.0 mm. Described from Iran ..... ***mannerheimi*** LACORDAIRE, 1845.
28. Tooth of the hind femur small and usually obtuse, sometimes indistinct ..... **29.**
- . Tooth of the hind femur well-developed, sharp ..... **37.**
29. Anterior angle of pronotum right or rounded, not sharp and laterally prominent. Upper side dark bronzy, unicolorous. Length 6.5–8.5 mm. Described from Friuli (N Italy) ..... ***springeri*** MÜLLER, 1916.
- . Anterior angle of pronotum sharp, laterally prominent ..... **30.**
30. First interval (close to suture) very finely, longitudinally wrinkled, its apical part usually sharp-pointed and elevated over the surface of elytron. Frons broad, eyes very convex ..... **31.**
- . First interval (close to suture) transversely or disorderly wrinkled, its apical part not elevated ..... **33.**
31. Intervals of elytron strongly, transversely wrinkled, feebly shining, silky, tooth of hind femur small, but perceptible. Upper side unicolorous, cupreous or bronzy, rarely



- greenish-black or blackish. Aedeagus as in fig. 7. Length 6.5–9.5 mm. Distributed from Iberian Peninsula and Ireland to Mongolia ..... ***impressa*** (PAYKULL, 1799).
- . Intervals of elytron very finely wrinkled, shining ..... **32.**
32. Tooth of hind femur absent. Upper side unicolorous, cupreous or cupreous-purplish. Aedeagus as in fig. 8. Length 6.0–9.0 mm (= *andalusiaca* KRAATZ, 1869, *inermis* FUENTE, 1904). Iberian populations were often considered as a distinct species *andalusiaca* KRAATZ, 1869, morphologically only weakly differing from African forms. Distributed in Algeria, Morocco, Spain, Sicily and ?Asia Minor .....  
..... ***apricans*** LACORDAIRE, 1845.
- . Tooth of hind femur situated subapically, small, but distinct. Body dark green with strong cupreous sheen. On middle of each elytron a broad cupreous red stripe. Externally similar to *aquatica* (thesis 26), but differs by shorter hind legs. Length 7.5–9.0 mm. Distributed in Japan (Honshu, Kyushu), Korea and NE China .....  
..... ***japana*** CHŪJŌ et GOECKE, 1956.
33. Hind femur tooth very small, but distinct and rather sharp. External angle of the apex of elytron broadly rounded ..... **34.**
- . Hind femur tooth very small, obtuse, hardly visible. External angle of the apex of elytron obtuse, but not broadly rounded ..... **26.**
34. Each elytron with 2 shallow impressions ..... **35.**
- . Each elytron with 4 impressions along suture and 2 weak impressions laterally. Upside unicolorous, dark red-cupreous. Length about 7.5 mm. Sometimes considered as conspecific with *gracilicornis* (antithesis 35). Described from Batumi ..... ***transcaucasica*** SUMAKOV, 1901.
35. First interval (close to suture) not or only partly transversely wrinkled. Legs entirely black. Upper side unicolorous, usually dark bronzy. General view as in plate II, **phot. 13.** Length 7.0–9.5 mm (= *platysterna* THOMSON, 1866). On *Scirpus lacustris* L. Distributed in North Europe and in northern part of Middle Europe .....  
..... ***brevicornis*** AHRENS, 1810.
- . First interval (close to suture) on whole length transversely wrinkled. Legs black with paler joints. Remaining characters as in *brevicornis* (thesis 34). Length 7.0–8.1 mm. Described from E Kazakhstan ..... ***kirgizkaisaka*** JACOBSON, 1925.

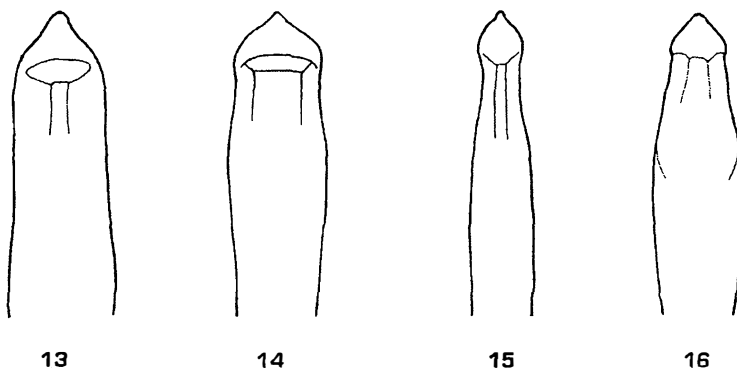


Figs 7-12. Tubular part of aedeagus in dorsal view (after WARCHAŁOWSKI 2003): 7 – *Donacia (Donaciomima) impressa*; 8 – *D. (D.) apricans*; 9 – *D. (D.) marginata*; 10 – *D. (D.) bicolora*; 11 – *D. (D.) semicuprea*; 12 – *D. (D.) obscura*.

36. Body broader and longer, elytron usually deeply and distinctly impressed, almost matt. Apical part of elytron densely wrinkled, elytral punctures here much finer, partially masked. Upper side usually bicolorous, bronzy, on each elytron with a purplish or violaceous lateral stripe. Aedeagus as in fig. 9. Length 9.5–12.0 mm (= *limbata* PANZER, 1796, *vittata* PANZER 1796, *lemnae* FABRICIUS, 1801, *lateralis* BONELLI, 1812, *trojana* GOECKE, 1942). Variations: elytral impressions indistinct (ab. *australis* JACOBSON, 1892 from Greece), upper side unicolorous (ab. *unicolor* WESTHOFF, 1882), ground colour of elytron purplish-violaceous, lateral stripe golden or cupreous (ab. *chlamydata* BALTHASAR, 1934). On *Sparganium* L. Widely distributed in North Africa, Europe and Middle Asia ..... ***marginata*** HOPPE, 1795.
- . Body smaller. Apical part of elytron not very densely wrinkled, elytral punctures distinct almost to apex, upper side shining. Upper side unicolorous, bronzy or cupreous. Length 8.0–9.0 mm (= ?*tanscaucasica* SUMAKOV, 1901, see antithesis 33). Occurs in Middle Asia and Transcaucasia. Perhaps here also *koenigi* JACOBSON, 1910, a very poorly known species, described from Transcaucasia based on one male specimen only ..... ***gracilicornis*** JACOBSON, 1899.
37. Elytra flattened, uneven, on each elytron 7 or 8 deep impressions. Underside covered with short, dense, golden hairs. Upper side silky, rather glaringly coloured, normally golden-green, rarely cupreous, sometimes bicolorous with bluish pronotum and greenish elytra. Elytral punctures in hind 1/4 lost among dense wrinkles. Legs with metallic lustre. General view as in plate II, **phot. 14**. Aedeagus as in fig. 10. Length 9.0–11.0 mm (= *sagittariae* FABRICIUS, 1792, *aurea* HOPPE, 1795). Variations: body smaller, elytral impressions very deep, central part of pronotum finely punctate, hind femur tooth smaller (subsp. *meridionalis* WEISE, 1886 from Italy), upper side bicolorous, as above (ab. *collaris* PANZER, 1795). On *Sparganium* L. Distributed in a great part of Europe, Asia Minor and Middle Asia, from Portugal and Ireland to Kazakhstan ..... ***bicolora*** ZSCHACH, 1788.
- . Elytra not strongly flattened, external impressions very shallow or absent. Elytral punctures in hind 1/4 finer, but distinctly visible ..... **38**.
38. Elytra strongly shiny, often with coarse transverse rugosities, not or weakly reticulate. Primary punctures in apical part well developed ..... **39**.
- . Elytra feebly shiny, ground reticulate or covered by very fine, transverse rugosities. Primary punctures in apical 1/4 at least 2 × finer than in the midlength of elytra ..... **40**.
39. First interval (close to suture) nearly as broad as the second. Pronotum strongly and closely punctate. Elytra convex with a broad, differently coloured stripe along the suture. Ground colour of elytron usually golden greenish, the stripe cupreous, sometimes purplish. Another combination of colours: ground greenish-blue, the stripe blackish. General view as in plate II, **phot. 15**. Aedeagus as in fig. 11. Length 5.5–8.5 mm (= *aenea* GISTL, 1857, *moerens* KUNZE, 1818, *tenebrans* WESTHOFF, 1882). A few variations were described: elytron bicolorous, metallic sheen not very strong, sometimes silky (typical form), elytron bicolorous, metallic sheen very strong (ab. *iris* WESTHOFF, 1882), elytron unicolorous (unnamed). On *Glyceria aquatica* L. Distributed in The British Isles, southern Scandinavia and in central part of European continent ..... ***semicuprea*** PANZER, 1796.
- . First interval (close to suture) much narrower than the second. Pronotum finely punctate or finely wrinkled. Pronotum scarcely punctured and finely wrinkled. Elytron

- usually with deep, transverse wrinkles. Upper side dark coloured, blackish with violaceous or cupreous reflex, exterior sides of elytra with a little stronger, golden-greenish sheen. Outline of aedeagus in dorsal view as in *impressa* (fig. 7), but a little broader. General view as in plate II, **phot. 16**. Length 7.0–9.0 mm. Several colour variations were described: metallic sheen cupreous, golden-greenish or green (typical form), metallic sheen blue or violaceous (ab. *coelestis* WEISE, 1893), hind femur among both sexes with three spines (ab. *tridens* JACOBSON, 1892). Forms a geographic race, ssp. *gracilipes* JACOBY, 1885 (= *tschitscherini* SEMENOV, 1895, *macrocnemia* WEISE, 1887), with vivid metallic (green, bronzy or cupreous) lustre of upper side. Food-plant unknown. Distributed in northern part of central Europe in Scandinavia and in Baltic countries, the subspecies in Mongolia, E Siberia, N China and Japan .....  
..... ***sparganii*** AHRENS, 1810.
40. Inner rows of elytral punctures entirely troubled anteriorly, elytron between scutellum and humeral callus irregularly punctate ..... **41**.  
– Inner rows of elytral punctures not troubled anteriorly ..... **42**.
41. Tarsi longer and narrower, tarsomeron 2 longer than broad. Upper side dark bronzy, dull. Aedeagus as in fig. **12**. Length 8.5–11.0 mm (= *splendens* JACOBSON, 1925, *?breviscula* JACOBSON, 1899). One variation was described: smaller (8.0–8.5 mm), elytra shining, upper side stronger wrinkled (ab. *barovskiyi* JACOBSON, 1924). Distributed in The British Isles, Middle Europe, Fennoscandia and Baltic countries, known also from Pyrenees. The subsp. *splendens* distributed in Mongolia, Russian Far East and Japan is newly considered as a distinct species, distributed in E Asia and represented in Japan by subsp. *hiurai* KIMOTO, 1983, here treated as a separate species (thesis 46) ..... ***obscura*** GYLLENHAL, 1813.  
– Tarsi shorter and broader, tarsomeron 2 broader than long. Upper side purplish. Length 8.5–9.5 mm. Distributed in Fennoscandia ..... ***aureocincta*** SAHLBERG, 1921.
42. Frons between eyes with two calli ..... **43**.  
– Frons between eyes without calli. Body similar to *Plateumaris* ..... **44**.
43. Frontal calli distinct, but not strongly developed. General outline of body more stout. Length 7.0–9.0 mm (= *sahlbergi* JACOBSON, 1900). Distributed in Transcaspiian area ..... ***bactriana*** WEISE, 1887.  
– Frontal calli strongly developed. General outline of body more slender. Fourth tarsomeron of hind tarsi shorter. Upper side unicolourous. Outline of aedeagus in dorsal view similar to *apricans* (fig. **8**). Length 7.0–9.0 mm. An Eurosiberian species, in S European countries rare ..... ***thalassina*** GERMAR, 1811.
44. Elytral impressions different: the anterior strong, the posterior very shallow. Length 6.0–7.0 mm. Distributed in Albania and Serbia ..... ***freyi*** GOECKE, 1940  
– On elytron both impressions similar, either strong, or shallow ..... **45**.
45. W Palaearctic species ..... **46**.  
– Species endemic to Japan ..... **47**.
46. Elytral impressions shallow. Hind part of elytron strongly wrinkled. Upper side shining, dark bronzy or cupreous, external intervals with greenish reflex. Length 8.5–9.5 mm. Widely distributed in Europe, from France to northern Russia .....  
..... ***brevitarsis*** THOMSON, 1884.  
– Elytral impressions strong. Hind part of elytron not strongly wrinkled. Upper side finely wrinkled, not strongly shining, unicolorous, bronzy or dark cupreous. Legs robust. Length 7.5–9.0 mm (= *gracilis* SUFFRIAN, 1845, *simplicifrons* LACORDAIRE, 1845).

- Occurs in Fennoscandia; all data from Middle Europe should be referred to *D. brevitarsis* ..... ***antiqua*** KUNZE, 1818.
47. Pronotum covered by strong punctures and rugosities. Elytra covered by very fine and close transverse rugosities. Colour of body brown with metallic reflex. Length 8.5–10.0 mm. Distributed in Hokkaido and Honshu. Considered also as subspecies of *obscura* (thesis 41) ..... ***hiurai*** KIMOTO, 1983.
- . Pronotum without any distinct transverse rugosities. Elytra covered by moderately fine and close transverse rugosities. Body entirely cupreous. Length 5.0–8.0 mm. Distributed in Honshu ..... ***katsurai*** KIMOTO, 1981.



Figs 13-16. Tubular part of aedeagus in dorsal view (after WARCHALOWSKI 2003): 13 – *Donacia* (*Donaciomima*) *impressa*; 14 – *Donaciella clavipes*; 15 – *D. tomentosa*; 16 – *D. cinerea*.

### Genus *Donaciella* REITTER, 1920

#### Key to species

1. Body dark, black with metallic reflex ..... **2.**
- . Body pale, yellowish. A great part of head and pronotum, metathorax and tarsi darkened, antennomeres darkened at apex. Length 7.0–8.3 mm (= *testaceipes* PIC, 1908). Distributed in Asia Minor ..... ***microcephala*** DANIEL, 1904.
2. Upper side not pubescent. Antennae and legs usually entirely testaceous or reddish brown, sometimes darker, but never with metallic lustre. Legs long and slender, tarsi approximatively as long as tibiae. Aedeagus as in fig. 14. Length 7.0–12.0 mm (= *aerea* SCHRANK, 1798, *menyanthidis* GYLLENHAL, 1827, *glabrata* SOLSKY, 1872). Widely distributed from southern France to northern China, reported also from NE Spain ..... ***clavipes*** (FABRICIUS, 1793).
- . Upper side pubescent. Legs for the most part reddish, thickened part of femora, apical part of tibiae and tarsal segments apically with green metallic lustre. Tarsi distinctly shorter than tibiae ..... **3.**
3. Antennal segment 3 twice as long as 2. Anterior calli of pronotum not prominent. Body slender, flattened, upper side blackish bronzy or blackish green,

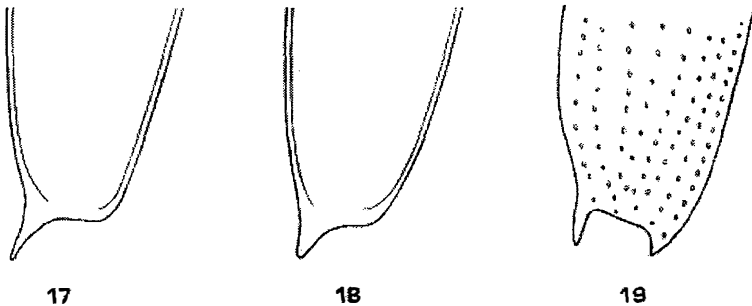
- in variations dark purplish, cupreous or (very rarely) azure. Aedeagus as in fig. 15. Length 7.0–9.5 mm. Distributed from southern France to Siberia ..... *tomentosa* (AHRENS, 1810).
- . Antennal segment 3 in a small degree longer than 2. Anterior calli of pronotum prominent, rounded. Upper side greenish bronzy or cupreous, but the ground colour is masked by the dense, silvery pubescence. Aedeagus as in fig. 16. Length 7.5–11.0 mm (= *hydrocharis* FABRICIUS, 1792, *tarsata* PANZER, 1796). Distributed from southern France and Ireland to Altai, reported also from NE Spain ..... *cinerea* (HERBST, 1784).

Genus *Macroplea* SAMOUELLE, 1819

*Apelma* BILLBERG, 1820; *Haemonia* DEJEAN, 1821.

Key to species

1. Apical tooth of elytron indistinct. Elytra sparsely covered by thin adpressed hairs. Head, scutellum and underside blackish, pronotum and elytra brown, testaceous to pitchy. On elytra no patterns, only along lateral bords runs a darker, blurred stripe. Interstices flat. Length 6.5–7.0 mm. Sometimes wrongly synonymized with *pubipennis* (thesis 2). Distributed in NW China (Takla-Makan, Kansu) ..... *piligera* (WEISE, 1889).
- . Apical tooth of elytron distinct, sometimes long. Interstices slightly or distinctly convex ..... 2.
2. Elytra and particularly pronotum distinctly pubescent. Process at apex of elytra very broad and obtuse. Length 4.5–6.0 mm (*piligera* WEISE, 1889), *incostata* PIC, 1907). Distributed in northern Europe, Middle Asia and north-western China. Described from Finland ..... *pubipennis* (REUTER, 1875).
- . Elytra nude or indistinctly pubescent ..... 3.
3. Species from Russian Far East. Head and antennae black, ground of pronotum and elytra yellow. On pronotum three longitudinal black stripes, on elytra black striae. Length 3.5 mm (male) to 3.9–4.5 mm (female). Distributed in Primorskiy Territory ..... *skomorokhovi* MEDVEDEV, 2006.
- . Species from West Palaeartic ..... 4.



Figs 17-19. Apical part of elytron (17, 18 after WARCHAŁOWSKI 2003, 19 after MEDVEDEV 1977): 17 – *Macroplea appendiculata*; 18 – *M. mutica*; 19 – *Neohaemonia voronovae*.

4. First segment of posterior tarsus distinctly shorter than the second. Apical tooth of elytron short and broad (fig. 18). Pronotum broader than long. Length 4.5–6.0 mm (= *zosteræ* FABRICIUS, 1801, *schioedtei* GUÉRIN, 1844, *gyllenhali* LACORDAIRE, 1845, *sahlbergii* LACORDAIRE, 1845, *baltica* SEIDLITZ, 1875, *kraussei* REITTER, 1910). Numerous colour- and sculpture variations alike several local forms: elytron with black strips (var. *curtisii* LACORDAIRE, 1845 from The British Isles), elytron very fine punctate, pronotum almost entirely black (var. *ruppiae* GERMAR, 1830 from Scandinavia), apex of elytron not sinuate (var. *incisa* SAHLBERG, 1870 from Finland), elytral interstices rugose, flattened (var. *lapponica* HELLEN, 1937 from Lapland), tubercle in the anterior angle of pronotum not separated from the anterior margin by a groove (?subsp. *balatonica* SZEKESY, 1941 from Balaton). Halophil. The adults occur under water on *Ruppia maritima* L. alike *Zostera* L. and *Zannichella* L.- species. Distributed in the coasts of the North- Baltic- Mediterranean and Caspian Sea ..... ***mutica*** (FABRICIUS, 1798).
- . First segment of posterior tarsus approximately as long as the second. Apical tooth of elytron longer, thin (fig. 17). Pronotum approximately as broad as long. Length 4.5–6.0 mm (= *equiseti* FABRICIUS, 1798, *mosellæ* BELLEVOYE, 1870, *mucronata* HOPPE, 1795). Variations: on elytra intervalls transversely wrinkled (ab. *rugipennis* SAHLBERG, 1870), pronotum uniformly testaceous (ab. *flavicollis* BELLEVOYE, 1870), on elytra rows of punctures forms black lines (ab. *lineata* CHEVROLAT, 1845), punctures of elytra not blackish (ab. *chevrolati* LACORDAIRE, 1845), elytra uniformly testaceous (unnamed). The adults occur on *Myriophyllum spicatum* L. and *Potamogeton* L. - species, also under water. Middle and North Europe ..... ***appendiculata*** (PANZER, 1794).

#### Genus *Neohaemonia* SZÉKESY, 1941

The genus *Neohaemonia* contains three species distributed in N America and one species described from Mongolia.

Body brownish, pronotum with characteristic elevate fold anteriorly, outline of apical part of elytron as in fig. 19. Length 6.1 mm. Described based on one female only ..... ***voronovæ*** MEDVDEV, 1977.

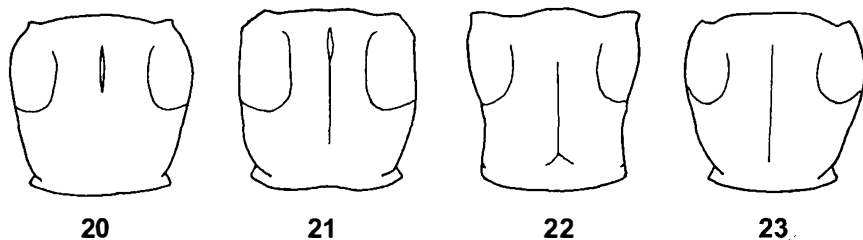
#### Genus *Plateumaris* THOMSON, 1859

*Juliusina* REITTER, 1920.

#### Key to species

1. Femora on lateral surface with punctures of two distinct sizes, the surface distinctly alutaceous ..... **2.**
- . Femora on lateral surface with punctures of uniform size, the surface not or indistinctly alutaceous ..... **3.**
2. Frons with a very deep median sulcus and two distinct longitudinal bulges. A doubtful (endemic?) species, described from Malta based on one female only ..... ***sulcifrons*** WEISE, 1900.

- Frontal sulcus not particularly deep. On pronotum (fig. 20) anterolateral setiferous tubercle indistinct. Pronotal disc flat, uniformly sparsely punctate and alutaceous, with median line; basal sulcus, callosal sulci and calli obsolete. Upper side blackish with weak metallic lustre. First antennal segment, legs and often 4 apical segments of abdomen reddish. Aedeagus as in fig. 24. Length 7.0–9.0 mm. (= *affinis* KUNZE, 1818, ?*sulcifrons* WEISE 1900). Several variations are described, more important aberrations: upper side more or less bluish (ab. *planicollis* KUNZE, 1818), elytra strongly punctured (ab. *pallipes* KUNZE, 1818), antennae testaceous (unnamed), upper side without metallic reflex (*fusca* ZSCHACH, 1788, incert.). Distributed in the western Palaearctic from Algeria to western Siberia. The form *sulcifrons* described from Malta considered sometimes as a distinct species ..... *rustica* (KUNZE, 1818).
- 3. Upper side black, at most with weak bluish or purplish metallic lustre. Antennae, legs and four apical segments of abdomen reddish brown. Base of elytron in most specimens with very fine setae. General view as in plate II, phot. 17. Outline of pronotum as in fig. 21. Aedeagus as in fig. 25. Length 9.0–11.0 mm (= *violacea* PALLAS, 1773, *palustris* HERBST, 1784, *nigra* FABRICIUS, 1792, *abdominalis* OLIVIER, 1795, *braccata* SCOP. auctorum). A variation with the metallic lustre of upper side rather distinct: ab. *fairmairei* LEGRAND, 1861. Distributed in the western Palaearctic from Ireland and Spain to Turkestan ..... *braccata* (SCOPOLI, 1772).
- Upper side of various metallic colours. Base of elytron in most specimens without fine setae ..... 4.



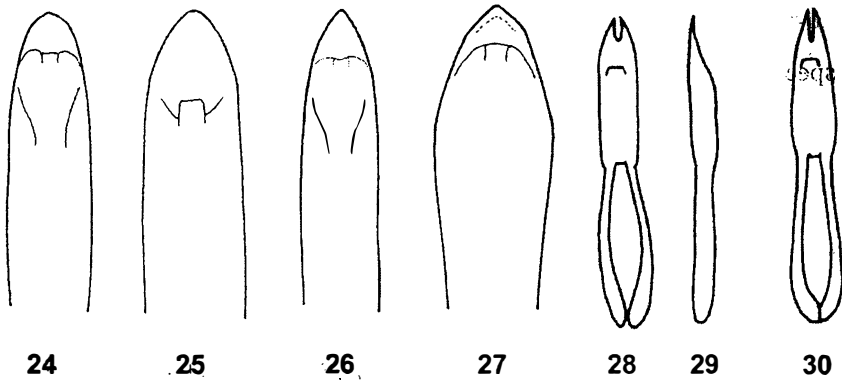
Figs 20-23. Outline of pronotum (after WARCHALOWSKI 2003): 20 – *Plateumaris rustica*; 21 – *P. braccata*; 22 – *P. consimilis*; 23 – *P. sericea*.

- 4. Pronotum a little cordiform (fig. 22). Very similar to *P. braccata* (thesis 3), but generally smaller. Aedeagus as in fig. 26. Length 6.8–8.5 mm. Several variations: anterior angles of pronotum sharp (typical form), anterior angles of pronotum obtuse (ab. *variabilis* KUNZE, 1818), upper side cupreous or bronzy (ab. *aerea* BECHYNÉ, 1942), upper side green or greenish (ab. *viridis* BECHYNÉ, 1942), upper side blue (ab. *coerulea* BECHYNÉ, 1942), upper side purplish or violaceous (ab. *violacea* BECHYNÉ, 1942), legs entirely testaceous (ab. *flavipes* BECHYNÉ, 1942), major part of legs blackish (ab. *nigripes* BECHYNÉ, 1942). Distributed in the most part of Palaearctis from western Europe to Japan ..... *consimilis* (SCHRANK, 1781).
- Pronotum not cordiform ..... 5.

5. Legs and antennae entirely metallic, some specimens with base of antennomeres and extreme femoral base rufous ..... 6.
- . Legs and antennae entirely or partly reddish yellow ..... 7.
6. Hind femora with distinct, sharp tooth. General view as in plate II, **phot. 18**, outline of pronotum as in fig. **23**. Aedeagus as in fig. **27**. Length 7.0–10.5 mm (= *discolor* PANZER, 1795, *aenea* HOPPE, 1795, *proteus* KUNZE, 1818, *asiatica* FALDERMANN, 1837, *palustris* SCHILLING, 1837, *comari* SUFFRIAN, 1846, *geniculata* THOMSON, 1866, *laevicollis* THOMSON, 1866). The most important variations: upper side with a strong metallic lustre (typical form), upper side blackish with a distinct metallic lustre (ab. *tenebricosa* WESTHOFF, 1882), upper side black with very feeble metallic reflex (ab. *luctuosa* WESTHOFF, 1882), upper side bluish to bluish-violaceous (ab. *festucae* FABRICIUS, 1792), upper side dark purplish (ab. *atropurpurea* WESTHOFF, 1882), upper side cupreous (ab. *nymphaeae* FABRICIUS, 1792), upper side golden-green (ab. *micans* PANZER, 1796), upper side dark bronzy (ab. *armata* PAYKULL, 1798), upper side violaceous, wrinkles on elytron very shallow (ab. *violacea* HOPPE, 1795), upper side violaceous, wrinkles on elytron deep (ab. *intermedia* APFELBECK, 1916), pronotum purplish, elytron blue-violaceous (ab. *tatrica* BALTHASAR, 1934). Moreover about 25 further variations were described. In E Asia forms a race (ssp. *sibirica* SOLSKY, 1872 = *socia* CHEN, 1941, *nipponensis* NAKANE, 1963), on average smaller, outline of body more slender, ab. *atropurpurea* predominate). A transpalaeartic species, very widely distributed from Ireland and northern Spain to Japan ..... **sericea** (LINNAEUS, 1761).
- . Hind femora with very small, blunt tooth. Antennae bicolorous, each antennomeron basally reddish, apically dark. Length about 7.0 mm. Described from E Siberia. Here perhaps *shirahatai* KIMOTO, 1971, reported from Russian Far East and Japan, having antennae without basal lightening ..... **obsoleta** JACOBSON, 1894.
7. In male apex of pygidium deeply incised. Legs dark with metallic reflex, basal part of tibiae and tarsi (partly) rust-reddish. Antennomeres apically darkened. Tooth on hind femora large, sharp. Upper side bronzy, sometimes bluish or purplish. Aedeagus with sharp ridge on ventral side. Length 6.7–9.7 mm (= *annularis* REITTER, 1920). Distributed in E Siberia ..... **roscida** WEISE, 1912.
- . In male apex of pygidium at most slightly incised ..... 8.
8. Legs dark with metallic sheen femora and tibiae basally rust-reddish. Hind femora with a small tooth or with a blunt tubercle only. Upper side bronzy-green. Length 6.6–7.1 mm. Distributed in Sakhalin, often considered as conspecific with *weisei* (antithesis 10) ..... **sachalinensis** MEDVEDEV, 1973.
- . Legs of largely or entirely rufous, some specimens with up to apical half of femur metallic, but tibia and tarsus at most infuscated, not metallic. Antennae with base of antennomeres rufous in most specimens, sometimes entirely rufous ..... 9.
9. Pronotum smooth, shining, sparsely and finely punctate ..... 10.
- . Pronotum covered by dense puncturation and rugosities, weakly shining ..... 11.
10. Smaller. Antenna robust, fifth antennomere subequal to fourth and sixth in length. Upper side dark cupreous, legs reddish brown with darkened 2/3 of femora. Length 6.4–7.6 mm. Described from Honshu ..... **akiensis** TOMINAGA et KATSURA, 1984.
- . Larger. Antenna slenderer, fifth antennomere longer than fourth and sixth in length. Upper side violaceous or bluish or blackish cupreous. Legs entirely reddish brown. Length 10.0–12.0 mm (= *kurilensis* MEDVEDEV, 1987). It forms three subspecies



(ssp. *babai* CHŪJŌ 1959, *chugokuensis* TOMINAGA et KATSURA, 1984 and *toyamensis* TOMINAGA et KATSURA, 1984) differing from nominotypical form in colouring of body. Distributed in Japan (Hokkaido, Honshu), the races on different islands (Niigata, Hyogo) ..... ***constricticollis*** (JACOBY, 1885).



Figs 24-30. Aedeagus in dorsal and lateral view (24-27 after WARCHALOWSKI 2003, 28-30 after WARCHALOWSKI 1885): 24 – *Plateumaris rustica*; 25 – *P. braccata*; 26 – *P. consimilis*; 27 – *P. sericea*; 28, 29 – *Orsodacne cerasi*; 30 – *O. humeralis*.

11. Antennae moderately thick and short, fifth antennomere longer than fourth or sixth in length. Hind femora with a large and sharp tooth. Upper side cupreous with weak greenish reflex. Length 6.5–8.5 mm. Distributed in E Siberia and Japan ..... ***amurensis*** WEISE, 1898.
- . Antennae long and slender. Tooth of hind femora small and blunt. Upper side bronzy-green, sometimes bluish or dark violaceous. Length 5.5–8.5 mm (= *mongolica* SEMENOV, 1895, *orientalis* SHAVROV, 1948, *hirashimai* KIMOTO, 1963), with finely pubescent pronotum and relatively very smooth upper side). Distributed from Fennoscandia to Japan ..... ***weisei*** DUVVIER, 1885.

### Genus ***Sominella*** JACOBSON, 1908

#### Key to species

1. Pronotum irregularly, intervals of elytra coarsely transversely corrugate. Apex of elytra deeply emarginate. General view as in plate III, **phot. 19**. Length 9.0–13.5 mm (= *excisipennis* JACOBSON, 1908). Distributed in N China, E Siberia and Korea ..... ***macrocnemia*** (FISCHER, 1823).
- . Pronotum partly transversely vermiculate-corrugate, intervals of elytra without transverse corrugations. Apex of elytra truncate. Length 10.0–11.0 mm. Distributed in C and SE China ..... ***longicornis*** (JACOBY, 1890).

## Subfamily *Orsodacninae*

In the Palaearctic area one genus only.

Genus *Orsodacne* LATREILLE, 1802

Literature: CROWSON 1946.

### Key to species

1. Pubescence of pronotum and elytra very short or absent. General view as in plate III, **phot. 20**. Aedeagus as in figs **28, 29**. Length 4.5–8.0 mm (= *chlorotica* OLIVIER, 1791, *fulvicollis* FABRICIUS, 1792, *glabrata* FABRICIUS, 1798). Extremely variable. The most important variations: body yellow, head and pronotum light reddish-brownish, upper side brownish (typical form), occiput, underside, sutural stripe and sides of elytra blackish (ab. *lacordairei* PIC, 1913), occiput, underside and apical part of elytra blackish (ab. *melanura* FABRICIUS, 1793 = *baudii* PIC, 1913), occiput, pronotum, underside and sides of elytra blackish (ab. *limbata* OLIVIER, 1808), anterior part of head, pronotum and underside red, occiput and elytra black (ab. *glabrata* PANZER, 1795) as above, but on pronotum lateral borders reddish only (ab. *hispanica* PIC, 1913), body bluish-black, head and pronotum red (ab. *cantharoides* FABRICIUS, 1775), body black, antennae and legs brownish (ab. *duftschmidi* WEISE, 1891), body black, pronotum reddish, antennae and legs black (ab. *kraatzi* PIC, 1913), body black, pronotum reddish, antennae and legs brownish (ab. *croatica* WEISE, 1883), as above, but on each elytron anteriorly a yellowish spot (ab. *bohemica* ROUBAL, 1914), as above, pronotum reddish (ab. *horvathi* LACZO, 1912), body black, anterior part of head and center of pronotum reddish (ab. *theresae* PIC, 1913), upper side reddish, top of head, suture and underside black (ab. *suturalis* JACOBSON, 1922). Numerous further variations were described. Distributed from England and southern France to western Siberia, known also from southern Scandinavia and Asia Minor .....  
..... ***cerasi*** (LINNAEUS, 1758).
- . Upper surface distinctly pubescent ..... **2**.
2. Whole upper surface closely punctate and pubescent; scutellum distinctly and rather closely punctate. Head dark brown, pronotum and scutellum reddish, remaining parts of body testaceous. Aedeagus as in fig. **30**. Length 4.0–7.0 mm (= *lineola* PANZER, 1795 nec FABRICIUS, 1781, *nigriceps* LATREILLE, 1807, *nematoides* LACORDAIRE, 1845, *violacea* CHEVOLAT, 1844, *flava* CSIKI, 1899, *marginella* DUFTSCHMID, 1825, *picipennis* DUFTSCHMID, 1825). Extremely variable. The most important variations: body coloured as above (ab. *lineola* PANZER, 1795), head and underside dark brown or blackish, pronotum and elytra testaceous (ab. *mespili* LACORDAIRE, 1845), elytron entirely testaceous, sometimes with a sutural stripe, remaining parts of body blackish (ab. *nigricollis* OLIVIER, 1808), elytron testaceous with a sutural and a lateral stripe black with bluish metallic lustre. Remaining parts of body black (ab. *marginata* CSIKI, 1899), upper side bluish black, pronotum posteriorly with two reddish spots, humeral calli reddish (typical form), body entirely black, sides of pronotum testaceous or brownish (ab. *kraatzi* PIC, 1913), body brownish, head and sternum black, scutellum, a transverse stripe in anterior part of elytra and a short sutural stripe black with violaceous metallic lustre (ab. *brancsiki* LACZO, 1909), body reddish brown, sternum

- and elytra bluish black (ab. *croatica* WEISE, 1883). Numerous further variations were described. Distributed in France, southern part of Middle Europe, Italy, Balkan Peninsula and Asia Minor ..... **humeralis** LATREILLE, 1804.
- . Pubescence and puncturation of upper surface much more sparse; scutellum impunctate. Head and elytra black with metallic sheen, pronotum reddish. Length 4.5–6.6 mm. Variation: elytra testaceous with greenish pattern (unnamed). Described from Kurdistan ..... **variabilis** BALY, 1877.

## Subfamily *Zeugophorinae*

The subfamily *Zeugophorinae* contains one genus only.

### Genus *Zeugophora* KUNZE, 1818

#### Key to subgenera

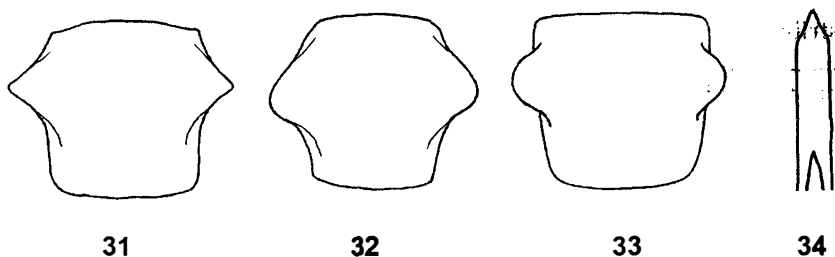
1. Eyes weakly and gently sinuate. Lateral tubercles of pronotum distinctly separate from anterior angles. In some species elytra uniformly black ..... *Zeugophora* s. str. (p. 26).
- . Eyes deeply sinuate. Lateral tubercles of pronotum joined with anterior angles. Elytra pale or bicolourous, never entirely black. E Palaearctic species only ..... *Pedrillia* (p. 27).

#### Subgenus *Zeugophora* s. str.

#### Key to species

1. Upper side uniformly testaceous ..... **2.**
- . Upper side not uniformly testaceous ..... **3.**
2. Body length 3.0 mm, apical antennomeres distinctly black. Described from NW Sichuan, based on one specimen only ..... *chinensis* MEDVEDEV, 1997.
- . Body length over 3.0 mm, antenna entirely pale. General view as in plate III, **phot. 22**. Length 3.2–3.6 mm (= *rufotestacea* KRAATZ, 1871). Occurs in N and W Europe .... *turneri* POWER, 1863.
3. Pronotum black, sometimes with anterior and posterior margins yellowish. Elytra black with bluish metallic reflex. Underside and legs yellowish brown. Length 3.0–3.5 mm. Distributed in East Siberia and Japan (Hokkaido, Honshu) ..... *hozumii* CHŪJŌ, 1953.
- . Pronotum pale, sometimes with anterior and posterior margins blackish ..... **4.**
4. Elytra black with a triangular yellowish spot behind humerus and with yellowish stripe along suture. Length 3.0–3.5 mm. Distributed in E Siberia ..... *bimaculata* KRAATZ, 1879.
- . Elytra not black with yellowish pattern ..... **5.**
5. Pronotum pale with anterior and posterior margins blackish, elytra yellowish brown with marginal area including epipleura and a small spot behind middle of each elytron blackish brown. Length 3.5 mm. Distributed in Japan (Hokkaido, Honshu) ... *chujoi* OHNO, 1961.
- . Pronotum uniformly pale ..... **6.**
6. Elytra pale with blackish stripe along suture and blackish margins in hind part. Frons with black spot in the middle. Length 3.5 mm. Variation: blackish pattern on elytra broader, marginal stripes reaching humeri; black frontal spot larger, covering also vertex (ab. *pseudoancora* REITTER, 1900). Described from NW China (Kashgar region) ..... *ancora* REITTER, 1900.
- . Elytra entirely black ..... **7.**

7. Head partly or entirely black ..... **8.**  
 -. Head entirely pale ..... **9.**  
 8. Body length about 4.0 mm. Elytra with bluish metallic reflex. Distributed in Japan (Hokkaido) ..... *japonica* CHŪJŌ, 1951.  
 -. Body length under 3.5 mm. Elytra without metallic reflex. Lateral tubercles of prothorax sharp at the apex, base of head black. Legs, prothorax and front of head yellowish, rest of body blackish. Outline of pronotum as in fig. **31**. Aedeagus as in fig. **34**. Length 2.5–3.5 mm. Variations: hind femora darkened (typical form), legs entirely yellow (ab. *australis* WEISE, 1881), hind and mid femora darkened (ab. *notatipes* PIC, 1925). Distributed in western and central Europe, from England and Pyrenees to Byelorussia ..... *flavicollis* (MARSHAM, 1802).



Figs 31-34. Outline of pronotum and tubular part of aedeagus in ventral view (31-33 after WARCHAŁOWSKI 2003, 34 orig.): 31 – *Zeugophora flavicollis*; 32 – *Z. subspinosa*; 33 – *Z. scutellaris*; 34 – *Z. flavicollis*.

9. Smaller. Scutellum usually black, on frons between eyes a longitudinal, convex, impunctate, shining stripe. Head, prothorax, legs and antennal segments 1–3 yellowish, rest of body black. Outline of pronotum as in fig. **32**. Aedeagus as in *scutellaris*. Length 2.7–3.3 mm. Distributed in western, central and northern Europe, from England and Pyrenees to western Siberia ..... *subspinosa* (FABRICIUS, 1781).  
 -. Larger. Scutellum usually yellow, on frons between eyes the impunctate stripe less convex, usually indistinct or absent. Outline of pronotum as in fig. **33**. General view as in plate III, **phot. 21**. Aedeagus in dorsal view as in *flavicollis*, in lateral view stronger bent. Length 3.4–4.0 mm. Variation: front black (ab. *frontalis* SUFFRIAN, 1840). Widely distributed in Europe and Asia from Belgium and eastern France to Middle Asia. Here probably also *Z. weisei* REITTER, 1889, described from Transcaucasia ....  
 ..... *scutellaris* SUFFRIAN, 1840.

#### Subgenus *Pedrellia* WESTWOOD, 1864

#### Key to species

1. Elytra marked with a number of spots. Body black, ground of upper side testaceous. On pronotum black dots situated transversely, on each elytron black spots at scutellum on humeri and postmedian, before apex a narrow, sinuate, transverse

- band. Variation: in hind half on each elytron three black spots (ab. *interrupta* PIC, 1944). Described from China ..... ***multisignata*** PIC, 1944.
- . Elytra uniformly coloured or with 1–2 markings ..... **2.**
  - 2. Elytra pale (testaceous or reddish), unicolorous or with slightly darker pattern ... **3.**
  - . Elytra largely black or with distinct dark (black or brown) pattern ..... **4.**
  - 3. Pronotum pale coloured, not largely black. Pronotum reddish brown. Meso- and metathorax, abdomen, femora and tibiae of mid and hind legs black. Antenna black with two basal antennomeres reddish. Length 3.0–4.0 mm. Distributed in Japan ...  
..... ***varipes*** (JACOBY 1885).
  - . Pronotum largely black. Head, antennae, pronotum (sometimes with pale basis) and legs black, elytra uniformly yellowish or brownish. General view as in plate III, **phot. 23**. Length 4.0–4.4 mm. Forms two variations: abdomen yellowish, pronotum sometimes with pale base (typical form), abdomen black (ab. *nigricollis* JACOBY, 1885, considered often as distinct species, but probably a eastern race of *bicolor*). Distributed in E Siberia (typical form), Korea and Japan (ab. *nigricollis*) .....  
..... ***bicolor*** (KRAATZ, 1879).
  - 4. Pronotum and legs testaceous. Head with black spot. On each elytron two black spots. Fore spot covers humeral calli and scutellar area, hind spot is situated on apical part, but not reaches the suture. Generally, black spots on elytra form two transverse bands and the testaceous mid part – transverse pale band. Length 4.0 mm. Described from Korea based on two females only. Not excluded conspecificity with *unifasciata* (thesis 5) ..... ***tresignata*** AN et KWON, 2002.
  - . Pronotum entirely or almost entirely black ..... **5.**
  - 5. Elytra black with a transverse yellowish band behind middle. Sometimes humerus and basal area and a spot at apex also yellowish. Legs partly black. Length about 3.0 mm. Distributed in Japan ..... ***unifasciata*** (JACOBY, 1885).
  - . Elytra yellowish, dark testaceous or blackish, in hind part with white-yellowish roundish spot, surrounded by black. General view as in plate III, **phot. 24**. Length 3.5–4.6 mm (= *biguttata* KRAATZ, 1879). Distributed in E Siberia and Japan .....  
..... ***annulata*** (BALY, 1873).

## Subfamily *Megalopodinae*

### Key to genera

1. Hind femur with a tooth near middle or apex of underside in both sexes ..... **2.**
- . Hind femur without ventral tooth, but often with a postmedian 1 or 2 teeth in male ...  
..... *Temnaspis* (p. 29).
2. Hind femur with 1 or 2 subapical teeth, sometimes 1 on middle of ventral side also ...  
..... *Colobaspis* (p. 29).
- . Hind femur without any subapical tooth, one tooth in the middle present only ....  
..... *Poecilomorpha* (p. 29).

### Genus *Poecilomorpha* HOPE, 1840

*Clythraxeloma* KRAATZ, 1879.

In the discussed area one species only. Body rusty-yellow or rusty-reddish, elytra metallic blue, middle of vertex and a large spot on pronotum black. Antennae black except 1–2 basal antennomeres, tarsi black. General view as in plate III, **phot. 25**. Length 7.5–10.0 mm. Distributed in E Siberia, Korea and China (Kansu, Kiangsu, reported also from Fukiem) ..... *cyanipectus* (KRAATZ, 1879).

### Genus *Colobaspis* FAIRMAIRE, 1894

Genus *Colobaspis*, considered often (partly or entirely) as congeneric with *Temnaspis*, contains about 7 species distributed in SE Asia. In discussed area one species only. Body elongate with subparallel sides, rather closely covered by suberect hairs. Pronotum subquadrate, constricted at base and apex. Hind femora thickened. Pronotum and elytra yellowish brown; head, prosternum, mesosternum and sides of metasternum black, abdomen and middle of metasternum yellowish. Legs blackish. Length 7.8–8.8 mm. Distributed in Japan (Honshu, Kyushu) ..... *japonica* (BALY, 1873).

### Genus *Temnaspis* LACORDAIRE, 1845

Genus *Temnaspis* contains almost 40 species distributed in Oriental area from India to Indonesia, also one species from Near East. In discussed area four species.

### Key to species

1. Species from Near East. General view as in plate III, **phot. 26**. Humeral calli very strongly protruding, outline of body similar as in *Crioceris*. Body entirely covered by long, erect hairs. Bicolourous, pale with black pattern. Head, legs and pronotum pale orange, elytra dark yellow. Antennomeres 5–11 and coxae blackish, mesosternum, metasternum, one spot on hind femora and scutellum black. Black pattern of upper side: on pronotum one short, median longitudinal stripe and two (in dorsal view only

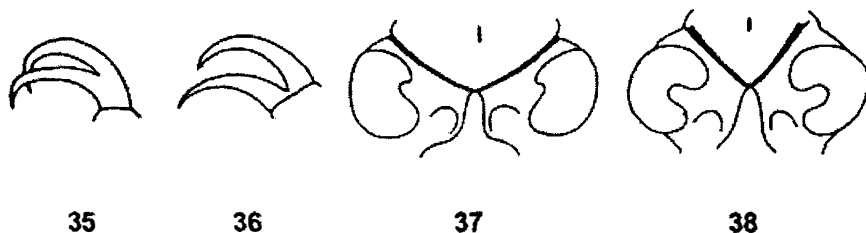
- partly visible) lateral roundish spots; on each elytron two (humeral and postmedian) great spots. Length 5.7–7.8 mm (= *quadrifasciata* REITTER, 1908). Distributed in southern Turkey and Syria ..... ***nigropunctata*** (PIC, 1896).
- . Species from E Asia ..... **2.**
  - 2. Elytra without black marking, length of body under 10.0 mm ..... **3.**
  - . Elytron reddish brown with blackish humerus. Length 10.0–11.0 mm. Distributed in N China (Gansu, Hebei) ..... ***humeralis*** (JACOBY, 1890).
  - 3. Pronotum entirely black or with black spot. Hind femur not thickened, with three teeth. Body, underside, legs and antennae black, elytra uniformly dark yellow. General view as in plate III, **phot. 27**. Length 8.2–10.0 mm (= *koreana* CHŪJŌ, 1934). Distributed in E China (Chekiang, Kiangsi, Kiangsu) and Korea ..... ***nankinea*** (PIC, 1914).
  - . Body, upper side, underside and ventral surface of hind femur reddish, metasternum (not always), antennae and remaining parts of legs black. Hind femora in female slightly, in male strongly thickened. In male both distal teeth on hind femora long. Length 7.0–8.0 mm. Distributed in basin of Amur ..... ***bonneuili*** PIC, 1947.



## Subfamily *Criocerinae*

### Key to genera

1. Tarsal claws fused together on basal 1/4–1/2 (fig. 35) ..... **2.**
- . Tarsal claws free (fig. 36) ..... **3.**
2. Upper interocular area (vertex) wider than long, its sides forming a front angle of more than 90° (fig. 37) ..... ***Oulema*** (p. 44).
- . Upper interocular area (vertex) longer, its sides forming a front angle of less than 90° (fig. 38) ..... ***Lema*** (p. 36).



Figs 35–38. 35, 36 – claws (after WARCHAŁOWSKI 1985): 35 – *Oulema melanopus*; 36 – *Crioceris asparagi*; 37, 38 sculpture of frons (after WARCHAŁOWSKI 1971): 37 – in genus *Oulema*; 38 – in genus *Lema*.

3. Head with a transverse depression across top at constriction behind eyes, pronotum strongly constricted near middle ..... ***Lilioceris*** (p. 39).
- . Head without a transverse depression across top at constriction behind eyes, pronotum constricted near basis ..... ***Crioceris*** (p. 31).

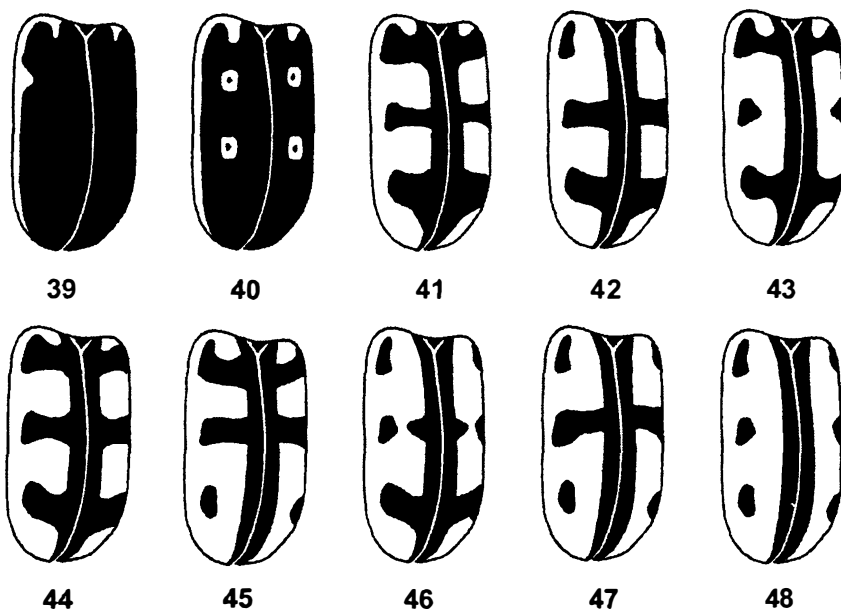
### Genus *Crioceris* FABRICIUS, 1762

#### Key to species

1. Head entirely black ..... **2.**
- . Head entirely or partly red ..... **10.**
2. Head and the black pattern of upper side with metallic lustre ..... **3.**
- . Head and the black pattern of upper side without metallic lustre ..... **6.**
3. Femora entirely black. Pronotum normally red with two central spots. Elytron bluish black with reddish sides and usually with three yellowish spots. General view as in plate IV, **phot. 28**. Aedeagus as in figs **49, 50**. Length 5.5–7.0 mm (= *campestris* LINNAEUS, 1767). For the most important aberrations and their names see caption to figs **39–48**. Several other colour aberrations were also described. On *Asparagus officinalis* L., injurious. Distributed from Iberian Peninsula to Central Asia, introduced also to North America, Argentina and Tanzania. In Persia, Caucasian countries and Asia Minor occurs subsp. *maculipes* (see thesis 4), in Middle Asia another subspecies, *C. asparagi turkestanica* MEDVEDEV, 1955, with deeply and strongly punctate pronotum.

Intermedial forms between subsp. *maculipes* and subsp. *turkestanica* are known ....  
 ..... *asparagi* (LINNAEUS, 1758).

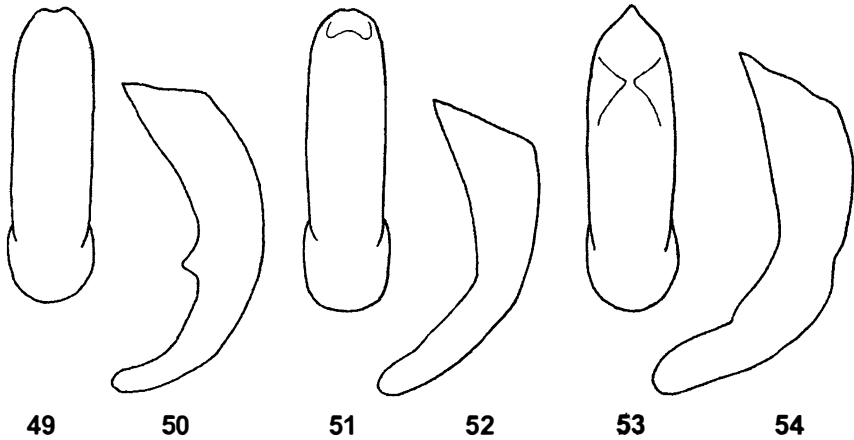
- Femora and tibiae at least in part reddish or yellow ..... 4.
- 4. Pronotum red with two (sometimes fused) black spots. Elytral pattern as in *C. asparagi* (thesis 3) ..... *asparagi* subsp. *maculipes* (GEBLER, 1834).
- Pronotum blackish with reddish borders ..... 5.



Figs 39-48. Colour variations of *Crioceris asparagi* (after WARCHALOWSKI, 1985): 39 - ab. *pici* HEYDEN, 1906; 40 - ab. *pupillata* AHRENS, 1812; 41 - ab. *linnaei* PIC, 1895; 42 - ab. *anticeconjuncta* PIC, 1900; 43 - ab. *schusteri* HEYDEN, 1906; 44 - ab. *impupillata* PIC, 1900; 45 - ab. *apiceconjuncta* PIC, 1900; 46 - ab. *quadripunctata* SCHUSTER, 1905; 47 - typical form; 48 - ab. *incrucifer* PIC, 1900.

- 5. Underside black. Pronotum and elytra black with blue or green metallic sheen, light orange bordered. On each elytron a longitudinal stripe whitish cream, sometimes divided into two or three pale spots, external black stripe often interrupted or reduced. General view as in plate IV, **phot. 29**. Aedeagus as in figs **51, 52**. Length 5.5-7.0 mm. About 20 variations were described. The most important: on elytron whitish longitudinal stripe not joined with orange border (typical form), the longitudinal stripe joined with orange border (ab. *lineata* PIC, 1897), on elytra black humeral and apical spots free, median spot fused with sutural stripe (ab. *henoni* PIC, 1912), ground colour of each elytron dark green, light dorsal stripe broadly interrupted (ab. *mediodisjuncta* PIC, 1906), elytra alterally with black humeral spot and a broad, irregular, transverse stripe posteriorly (ab. *sefrensis* PIC, 1912, sometimes treated as distinct species), elytra laterally with two (humeral and apical) black spots (ab. *simoni* CHABAUT, 1907). Distributed in W Medirerranean area, from Morocco and

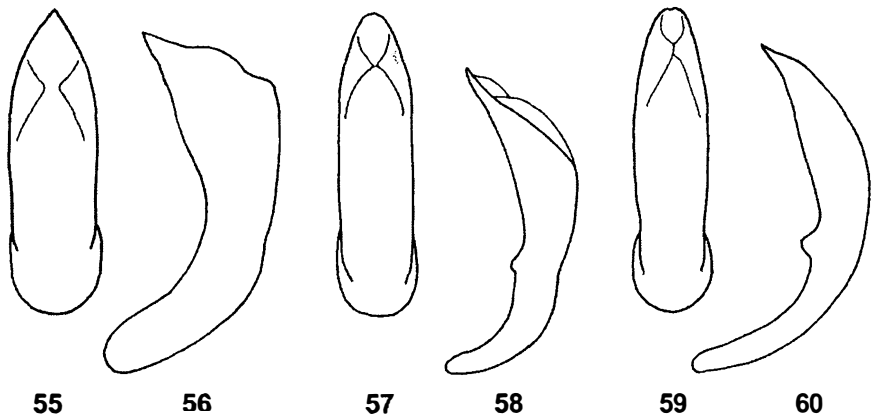
- Portugal to Sicily, Italy and Greece. Here probably *vittigera* COSTA, 1842, described from Sicily ..... *macilentata* WEISE, 1880.
- Underside in part yellow. Legs entirely or almost entirely pale, yellowish. General view as in plate IV, **phot. 30**. Length 4.5–5.5 mm. Distributed in Canary Islands ..... *nigropicta* WOLLASTON, 1864.
  - 6. Black sutural stripe absent. Upper side largely reddish brown, head, ventral surfaces, antennae and legs entirely black. Elytron reddish brown, usually with a black humeral spot, in aberrations with humeral, postmedian and apical spot, sometimes entirely red. Length 4.8–6.0 mm. Distributed in Taiwan and Japan (Hokkaido, Honshu, Kyushu) ..... *orientalis* JACOBY, 1885.
  - Black sutural stripe present ..... 7.
  - 7. Black sutural stripe parallel or a little narrowed anteriorly ..... 8.
  - Black sutural stripe widened anteriorly, median frontal groove long and deep. Pronotum usually unicolorous, red, sometimes with a black spot or two parallel, longitudinal stripes ..... 9.



Figs 49-54. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 2003): 49, 50 – *Crioceris asparagi*, 51, 52 – *C. macilentata*, 53, 54 – *C. paracenthesis*.

- 8. Pronotum red, with two longitudinal black stripes. Femora for the most part, head and abdomen black. Median frontal groove shallow, strongly shortened or absent. General view as in plate IV, **phot. 31**. Aedeagus as in figs **53, 54**. Length 4.0–5.0 mm. Elytron red with sutural stripe and four lateral spots black: two on humeral callus, one in the middle and one in hind part, usually jointed with the sutural stripe. Variations: apical spot absent (ab. *suturalis* GRAVENHORST, 1807), elytral pattern blurred (ab. *dahli* LACORDAIRE, 1845). Distributed in a great part of Mediterranean area, from Morocco, Portugal and Spain to Greece ..... *paracenthesis* (LINNAEUS, 1767).
- Pronotum entirely, femora, lateral spots on head and two apical segments of abdomen red. Median frontal groove long and deep. Colouration of elytra as in *paracenthe-*

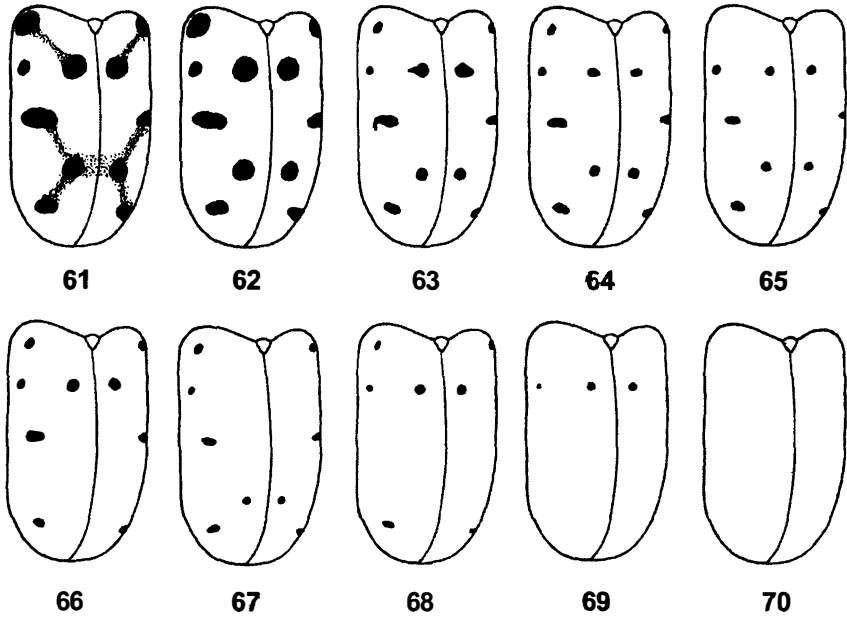
- sis, but median spot often absent. Length about 5.0 mm. Distributed in Caucasian countries ..... **sokolowi** JACOBSON, 1894.
9. Elytral lateral median spot present. General view as in plate IV, **phot. 32**. Aedeagus as in figs **55, 56**. Length 4.5–6.0 mm. Distributed in Greece, Bulgaria, Asia Minor, Caucasian countries and in Middle Asia ..... **bicrucciata** (SAHLBERG, 1823).
- . Elytral lateral median spot absent. General view as in plate IV, **phot. 34**. Aedeagus as in figs **57–58**. Length 5.0–6.5 mm. Variations (figs **71–73**): pronotum unicolorous, red or with a little black spot in hind part (typical form), pronotum with a central bifurcate black spot (ab. *thoracica* WEISE, 1893, fig. **71**), preapical spot divided into two black dots (ab. *kaufmanni* KASZAB, 1962, fig. **73**). The darkest aberration, almost entirely black, ab. *nigerrima* JACOBSON, 1900, was described from S Russia. Distributed in the basins of Danube, Dnieper and Volga rivers ..... **quinquepunctata** (SCOPOLI, 1763).



Figs 55–60. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 2003): 55, 56 – *Crioceris bicrucciata*, 57, 58 – *C. quinquepunctata*, 59, 60 – *C. duodecimpunctata*.

10. Elytra at least on anterior 2/3 with black sutural stripe ..... **11**.  
 –. Elytra without black sutural stripe ..... **13**.
11. Black sutural stripe broad, reaching apex of elytra ..... **12**.  
 –. Black sutural stripe narrowed apically, not reaching apex of elytra. Coloured rather similar as *oschanini* (thesis 12), but abdomen red and metathorax partly or entirely black. Length 4.5–5.5 mm. Distributed in Kazakhstan and Turkmenia ..... **iliensis** WEISE, 1900.
12. Head and pronotum red, elytra yellowish with black suture and two lateral spots on each. Pronotum punctured on whole surface. Abdomen largely black, except pale basis and apex. Length 4.2–5.0 mm (= *egregia* WEISE, 1890, *koltzei* WEISE, 1892). Distributed in Central Asia ..... **oschanini** DOHRN, 1884.  
 –. Head and pronotum red, elytra yellowish with black suture and two or three lateral spots on each. In variations (unnamed) elytra entirely black. Pronotum distinctly

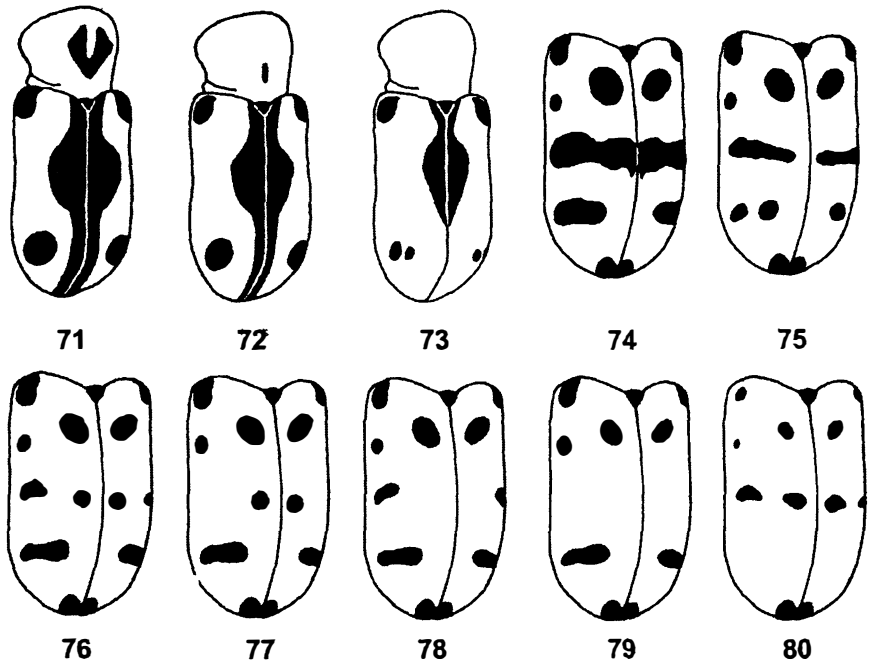
punctured along anterior border and along the middle only. Length 4.4–5.1 mm.  
 Described from Afghanistan ..... *afghana* MEDVEDEV, 1978.



Figs 61-70. Colour variations of *Crioceris duodecimpunctata* (after WARCHALOWSKI 1985 and 2003):  
 61 – ab. *bisbiconnexa* PIC, 1919; 62 – ab. *dodecastigma* SUFFRIAN, 1841; 63 – ab. *revyi* KASZAB, 1962;  
 64 – typical form; 65 – ab. *gisellae* KASZAB, 1962; 66 – ab. *ruffi* KASZAB, 1962; 67 – ab. *guranyii* KASZAB,  
 1962; 68 – ab. *bisquadripunctata* KASZAB, 1962; 69 – ab. *steinmanni* BODOR, 1965; 70 – ab. *delagrangei*  
 PIC, 1919.

13. Apex of elytron red. Pronotum unicolorous, without black spots. Upper side red or yellowish-red, scutellum black, each elytron with 6 black spots. General view as in plate IV, **phot. 33**. Aedeagus as in figs **59, 60**. Length 5.0–6.5 mm. For the most important aberrations and their names see caption to figs **61–70**. A transpalaeartic species, distributed very widely from Portugal and England to Korea, in North Africa and in Fennoscandia absent ..... *duodecimpunctata* (LINNAEUS, 1758).
- . Apex of elytron black. Pronotum with 5 (sometimes 4) black spots, Upper side red or yellowish-red, scutellum black, each elytron with 7 black spots. Aedeagus as in figs **81, 82**. Length 5.0–6.5 mm. For the most important aberrations and their names see caption to figs **74–80**. In Asia forms colour varieties, usually considered as subspecies: underside and legs entirely black (subsp. *sibirica* WEISE, 1887, distributed in basin of Amur and in Japan), head, pronotum, underside and legs entirely black (subsp. *mandschurica* MEDVEDEV, 1958, distributed in NE China), frons without black spot (subsp. *innotaticeps* PIC, 1916 described from Tsinghai). Moreover from Mongolia is described a subspecies (perhaps distinct species) *tshingisana* LOPATIN, 1966 with apex of aedeagus incised, pronotum and elytra uniformly red and remaining part of

body black, alike an colour variation of them, coloured as *quatuordecimpunctata* s. str. Distributed from Central (Germany, Poland) and south-eastern Europe (Croatia, basins of Danube, Dnieper and Volga rivers) to NE China and Japan ....  
 ..... *quatuordecimpunctata* (SCOPOLI, 1763).



Figs 71-80. Colour variations (after WARCHAŁOWSKI 1985): 71-73. *Crioceris quinquepunctata*: 71 – ab. *thoracica* WEISE, 1893; 72 – typical form; 73 – ab. *kaufmanni* KASZAB, 1962. 74-80 – *Crioceris quatuordecimpunctata*: 74 – ab. *russica* PIC, 1916; 75 – ab. *csikii* KASZAB, 1962; 76 – typical form; 77 – ab. *internepunctata* CSIKI, 1953; 78 – ab. *moravica* ROUBAL, 1946; 79 – *parumpunctata* ROUBAL, 1949; 80 – ab. *deficiens* ROUBAL, 1949.

Genus *Lema* FABRICIUS, 1798

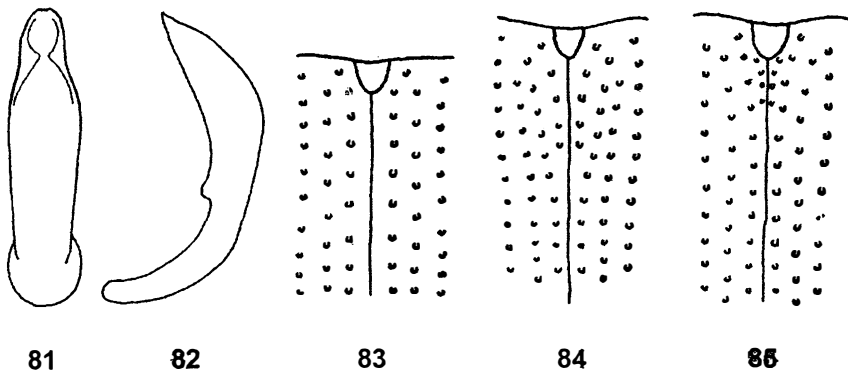
Key to subgenera

1. On elytra scutellar row of punctures absent, puncturation of elytra always arranged in longitudinal rows, even in basal area, without extra primary punctures near scutellum (fig. 83) (= *Bradylema* WEISE, 1901) ..... *Petauristes* (p. 39).
- . On elytra scutellar row of punctures present or at least puncturation near scutellum confused by extra primary punctures of similar size ..... 2.
2. Punctures of scutellar row similar in size to those of neighbouring rows (fig. 84) ..... *Lema* (p. 37).
- . Punctures of scutellar row much finer than those of other rows (figs 85) ..... *Microlema* (p. 39).

Subgenus *Lema* s. str.

Key to species

1. Pronotum in anterior part with a feeble transverse groove, very shallow in its middle. Upper side reddish, antenna, legs and underside largely black. Length 5.0–5.5 mm (= *coomani* PIC, 1924, *paagai* CHŪJŌ, 1933). Distributed in Indochina, supposedly also in Sichuan ..... ***rugifrons*** JACOBY, 1889.
- . Pronotum without any transverse groove in anterior part ..... **2.**
2. Each elytron with a hollow in anterior part near suture. Body pitchy black with aeneous metallic reflex. Antennae thick, testaceous, antennomeres 8 and 9 blackish. Legs testaceous, apices of tibiae and a spot on underside of each femur blackish. Length about 6.0 mm. Distributed in W China (Sikang) ..... ***bifoveipennis*** PIC, 1934.
- . Elytra without any hollows ..... **3.**
3. Upper side uniformly blue, at most head partly red ..... **4.**
- . Pronotum or/and elytra at least partly red ..... **8.**
4. Pronotum very strongly and densely punctate. Upper side black with a strong bluish (sometimes bluish-greenish), metallic sheen, underside black; antennae and legs black with a feeble metallic reflex. General view as in plate IV, **phot. 35**. Aedeagus as in figs **86, 87**. Length 4.8–5.6 mm (= *puncticollis* CURTIS, 1830, *rugicollis* SUFFRIAN, 1841, *pygmaea* KRAATZ, 1879). A transpalaeartic species, distributed from Spain and the British Isles to Korea. Here also *cirsicola* CHŪJŌ, 1959, on average slightly larger (5.5–6.3 mm), distributed in Japan (Honshu, Shikoku, Kyushu), perhaps a race of *cyanella* ..... ***cyanella*** (LINNAEUS, 1758).
- . Pronotum distinctly, but not strongly and densely punctate ..... **5.**
5. Vertex with reddish marking ..... **6.**
- . Vertex bluish black. Body black, upper side bluish. Forms a colour variation: three apical sternites of abdomen yellowish (ab. *haemorrhoidalis* WEISE, 1889 = *ventralis* KUWAYAMA, 1932). Length 5.0–6.5 mm (= *inaequalicollis* PIC, 1924, *atriventris* PIC, 1924, *kiotoensis* PIC, 1929, *sikanga* GRESSIT, 1942). Distributed in N China, Korea and Japan ..... ***concinnipennis*** BALY, 1865.



Figs 81-85. (81, 82 after WARCHALOWSKI 2003, 83-85 after GRESSIT and KIMOTO 1961): 81, 82 – *Crioceris quatuordecimpunctata*, aedeagus in dorsal and lateral view; 83-85 – puncturation of elytra: 83 – in subgenus *Petauristes*; 84 – in subgenus *Lema* s. str.; 85 – in subgenus *Microlema*.

6. Mid tibia with a distinct spine. Body black or blackish blue, on vertex a transverse red stripe (typical form), sometimes pronotum reddish, elytra bluish with reddish apical margins. General view as in plate IV, **phot. 36**. Length 5.0–6.0 mm. Distributed in China and Japan ..... *coronata* BALY, 1873.
- . Mid tibia without spine ..... 7.
7. Larger. On head two reddish spots, pronotum black with weak bluish reflex. Legs black. Length 5.5 mm. Described from Tibet ..... *bimaculaticeps* PIC, 1924.
- . Smaller. On vertex a large reddish spot. Legs reddish brown, often darkened, sometimes almost black. Length 3.8–4.2 mm. Distributed in Japan ..... *dilecta* BALY, 1873.
8. Head and elytra entirely reddish, pronotum blackish with reddish basal part. Length 5.8 mm. Described from Szechuan ..... *piceocastanea* GRESSIT et KIMOTO, 1961.
- . Upper side differently coloured ..... 9.
9. Pronotum and elytra red or brownish ..... 10.
- . Elytra at least partly blue ..... 11.
10. Body red, head, antennae, legs and most part of underside black. Length about 5.5 mm (= *coreana* CHŪJŌ, nec PIC, 1924, *peninsularis* GRESSIT et KIMOTO, 1961). Described from Korea ..... *coreensis* MONRÓS, 1960.
- . Body pale reddish ochraceous, head and pronotum slightly darker than elytra. Underside except prosternum pitchy black. Mid and hind legs blackish, fore legs ochraceous to reddish brown. Length about 7.4 mm. Described from Sichuan ..... *szechuana* GRESSIT et KIMOTO, 1961.
11. Fore parts of head (clypeus, labrum, mandibles) black, remaining parts of head and pronotum entirely red. Elytra metallic greenish-blue, laterally with violaceous shine. First abdominal segment and thorax partly orange, remaining parts of underside and legs black. General view as in plate V, **phot. 37**. Length about 5.5 mm (= *pulchrula* GRESSIT, 1942). Distributed in S China and in Sichuan ..... *infranigra* PIC, 1924.
- . Body differently coloured ..... 12.
12. Elytra blue with a broad yellowish or reddish transverse band, head black with pale neck, antennae black. Remaining parts of body reddish testaceous. General view as in plate V, **phot. 38**. Length 4.3–4.5 mm. Distributed in China and Japan (Honshu, Kyushu, Shikoku) ..... *delicatula* BALY, 1873.
- . Elytra differently coloured ..... 13.
13. Occiput with large punctures, interstices covered by much smaller puncturation, feebly shining. Pronotum reddish. Elytra blue with a rectangular sutural reddish spot and reddish apical area. Legs dark orange, mid and hind tibiae darkened on apex. General view as in plate V, **phot. 39**. Length 5.6–5.8 mm. Distributed in E Siberia, N. China, Korea and Japan ..... *scutellaris* (KRAATZ, 1879).
- . Occiput rather finely and closely punctate. Pronotum reddish, elytra very variably coloured: uniformly yellowish (typical form), yellowish with blurred bluish spot on humeri (ab. *cyaneohumeralis* HEINZE, 1943), on each elytron two bluish spots, humeral and subapical (ab. *quadriplagiata* HEINZE, 1943), on each elytron bluish pattern broadened and fused into a longitudinal stripe (ab. *dooi* KUWAYAMA, 1932), elytra bluish or bluish black, suture and apex yellowish (ab. *suturalis* HEINZE, 1943), elytra bluish or bluish black with yellowish apex (ab. *lewisi* BALY, 1873). General view as in plate V, **phot. 40**. Length 5.5–6.2 mm (= *chinensis* JACOBY, 1890, *coreana* PIC, 1924). Distributed in N China, Korea and Japan ..... *diversa* BALY, 1873.



Subgenus *Microlema* PIC, 1932

Key to species

1. Body black, elytra dark orange, tibiae and tarsi usually entirely reddish. On each elytron a little humeral dot and two large, transverse spots black. Length 5.0–6.0 mm (= *akinini* HEYDEN, 1887, *margelanica* WEISE, 1894, *bimaculata* WEISE, 1900, *distigma* WEISE, 1913). Distributed in Kazakhstan and Kirgisia .....  
..... *quadrимaculata* GEBLER, 1845.
- . Body colouration similar as in *quadrимaculata* (thesis 1), but on each elytron one humeral and four small spots black. Tibia usually in proximal part reddish, sometimes entirely black. Length 4.5–5.8 mm (= *rubropunctata* GEBLER, 1830, *semiobliterata* PIC, 1907). General view as in plate V, **phot. 41**. Variations: metallic reflex on pronotum weak, hind margins of abdominal sternites reddish, femora and tibiae in basal part red, black spots on elytra often partly reduced (ab. *japonica* WEISE, 1890), elytra uniformly reddish brown (ab. *brunneipennis* KUWAYAMA, 1932 = ab. *nankinea* PIC, 1945), humeral spot absent, remaining characters as in typical form (ab. *nadari* PIC, 1945), on each elytron two anterior spots joined (ab. *kiautschauna* HEINZE, 1943). Distributed in China, Mongolia, E Siberia, Korea and Japan (Honshu, Shikoku, Kyushu) ..... *decempunctata* GEBLER, 1830.

Subgenus *Petauristes* LATREILLE, 1829

Key to species

1. On pronotum four small black spots. Ground colour of pronotum orange testaceous. Disc of elytra blackish with pale lateral and sutural surrounding, apical part dark ochraceous or orange testaceous. In variations testaceous parts darkened, almost pitchy. Length 5.8–6.6 mm (= *quadripunctata* SWARTZ, 1808 nec OLIVIER, 1808, *swartzi* CLARK, 1866, *trapezinotata* GRESSIT, 1942). Distributed in N China, Korea and Japan ..... *adamsii* BALY, 1865.
- . Pronotum reddish or red, without black spots, elytra bluish or greenish with metallic shine ..... **2.**
2. Underside and 2–11 antennomeres black. Pronotum, head and first antennomere red, elytra deep bluish, legs black with blue reflex. General view as in plate V, **phot. 42**. Length 5.0–6.2 mm. Distributed in China, Taiwan, Korea and Japan .....  
..... *honorata* BALY, 1873.
- . Underside red, legs bicolorous (femora red, tibiae entirely black). Punctures in central part of pronotum large, arranged in a pair of longitudinal rows. Length about 7.4 mm (= *postrema* BATES, 1866). Distributed in SE China to Sichuan, Sikang and Anhwei ..... *fortunei* BALY, 1859.

Genus *Liliocerus* REITTER, 1912

Key to subgenera

1. Elytron without a scutellar row of punctures. Upperside reddish brown with black pattern ..... *Bradycerus* (p. 40).

- Elytron with a short scutellar row of punctures ..... **2.**
- 2. Elytron conspicuously raised at suture behind scutellum, elytral punctures extremely large, foveolate ..... **Chujoita** (p. 40).
- Elytron not conspicuously raised behind scutellum, elytral punctures normal ..... **Liliocerus** s. str. (p. 40).

Subgenus **Bradycerus** CHŪJŌ, 1951

One species only. Elytra reddish, ground of pronotum similarly coloured but darker, on pronotum 5 (1+3+1) or 7 (2+3+2) slightly blurred black spots, suture and often on each elytron a longitudinal median stripe darnened or blackish. General view as in plate V, **phot. 43**. Length about 6.0 mm. Distributed in Japan (Honshu, Shikoku) ..... **lewisi** (JACOBY, 1885).

Subgenus **Chujoita** MONRÓS, 1959

In discussed area one species only. Outline of body short and broad. General colour dark reddish brown, shining, tarsi yellowish brown, claws pitchy black. Elytra very strongly convex at the middle of basis, forming almost a conical hump, behind this elevation transversely depressed. Length about 9.0 mm. Distributed in China, Taiwan and Korea ... **gibba** (BALY, 1861).

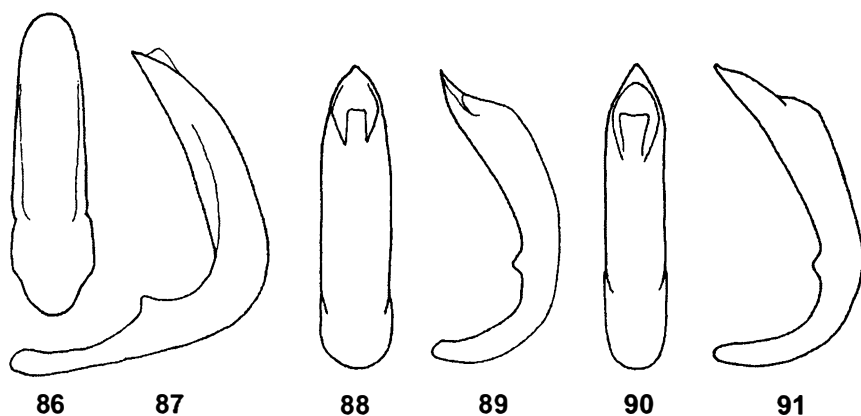
Subgenus **Liliocerus** s. str.

**Criocerus jurkiewiczi** BRANCSIK, 1914, an unclear species described from Transcaspia (perhaps an aberration of *faldermanni*), not included in the key.

Key to species

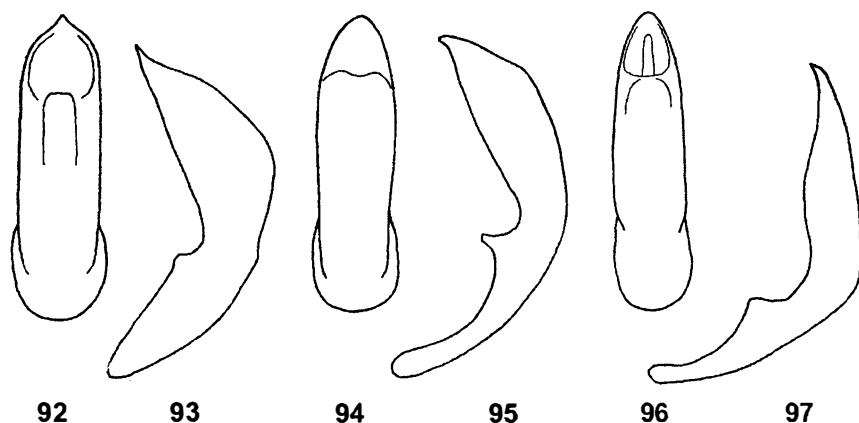
- 1. Elytra and pronotum uniformly yellowish, reddish or brownish, without pattern ..... **10.**
- Colouration of upper side different ..... **2.**
- 2. Elytra testaceous with bronzy, cupreous or purplish sutural stripe, underside with metallic sheen ..... **3.**
- Elytra differently coloured ..... **4.**
- 3. Pronotum with a pair of feeble puncture-rows. Antennomere 4 longer than 3 and slightly shorter than 5. Upperside reddish brown, pronotum slightly darker than elytra, elytra with a bronzy sutural stripe. On each elytron three impunctate stripes. Length about 7.8 mm. Distributed in W China (Szechuan) ..... **cupreosuturalis** (GRESSIT, 1942).
- Pronotum randomly punctate. Antennomere 4 subequal to 3 and 2× shorter than 5. Elytra testaceous with broad, purplish brown sutural stripe, pronotum and scutellum dark bronzy. Underside greenish, bluish or testaceous with metallic sheen. Length about 5.0 mm. Described from Szechuan ..... **semimetallica** GRESSIT et KIMOTO, 1961.

4. Elytra black with orange humeral spot of different size and rather irregular form, usually covering basal 1/4 of elytron. General view as in plate V, **phot. 45**. Remaining parts of body black. Length 6.7–7.9 mm. Distributed in Ussuria, China, Korea and Japan (Tsushima) ..... **scapularis** (BALY, 1859).  
 – Elytra unicolorous ..... 5.
5. Elytra testaceous with metallic reflex. Remaining parts of body black with greenish metallic shine, underside partly reddish. Antennae black, robust. Length about 6.0 mm. Distributed in China (Kansu, Fukien) ..... **minima** (PIC, 1936).  
 – Upper side differently coloured ..... 6.
6. Elytra red or reddish, pronotum black or blackish ..... 7.  
 – No combination of blackish pronotum and reddish elytra. Elytra black or bluish ...  
 ..... 8.
7. Pronotum uniformly blackish with cupreous or bronzy reflex, elytra reddish brown also with feeble cupreous reflex. Length 6.8–7.0 mm. Distributed in Japan (Honshu, Shikoku, Kyushu) ..... **parvicollis** (BALY, 1873).  
 – Body black without metallic reflex, elytra red only. Length 7.0–7.2 mm (= ? *bechynei* MEDVEDEV, 1958). Distributed in W China ..... **thibetana** (PIC, 1916).
8. Elytra black with bluish or violaceous reflex. Head, pronotum, prosternum, at least underside if fore femora, knees and three apical sternites of abdomen red. Meso- and metasternum, basal part of abdomen, antennomeres 2–11, tarsi, mid and hind femora black. General view as in plate VI, **phot. 46**. Length about 8.5 mm (= *siewersi* HEYDEN, 1887). Distributed in China, Korea and Japan ..... **ruficollis** (BALY, 1865).  
 – Elytra pure black or blackish ..... 9.
9. Upper side black with basal 1/3 of pronotum reddish. Length 9.0 mm. Described from China (Sikang) ..... **biparticollis** PIC, 1934.  
 – Body generally blackish, pronotal basis piceous, abdomen blackish with pale surrounding. Length 6.6 mm. Described from China (Szechuan) .....  
 ..... **grahami** GRESSIT et KIMOTO, 1961.
10. Legs uniformly black ..... 11.  
 – Legs at least partly red or yellowish ..... 16.



Figs 86–91. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 2003 and orig.): 86, 87 – *Lema cyanella*; 88, 89 – *Liliocerus faldermanni*; 90, 91 – *L. meridigera*.

11. Abdomen black ..... **12.**  
 -. Underside brownish red, usually slightly darker than upper side, meso- and metasternum laterally and abdomen partly darkened ..... **14.**
12. Preapical antennomeres (7–10) not longer than broad. Scutellum glabrous or at most with a few short hairs basally. Pronotum and elytra very dark red, strongly and coarsely punctured. Remaining parts of body black. General view as in plate VI, **phot. 47.** Length 6.2–8.0 mm. In NW China forms one subspecies: larger, length of body 8.2–9.2 mm, on elytra puncture rows shallower and often somewhat confuse (subsp. *sparsipunctata* MEDVEDEV, 1958). Distributed in China and Japan (Honshu, Shikoku, Kyushu) ..... ***rugata*** (BALY, 1865).  
 -. Preapical antennomeres (7–10) distinctly longer than broad ..... **13.**
13. Head entirely or almost entirely red. Here *L. tibialis* ab. *nigripes* (thesis 19).  
 -. Head black. Pronotum and elytra red. Length 6.5–8.0 mm (= *merdigera* FABRICIUS, 1775 nec LINNAEUS, 1758, *liliorum* THOMSON, 1866, *regeli* BALLION, 1878, *amurensis* PIC, 1916, *biguttata* MÜNZNER, 1934). Here possibly also the unclear species *antevallata* JAKOB, 1954 described from Iran. Variation: body entirely black (ab. *schepmani* PIC, 1934). One subspecies, ssp. *okinawana* NAKANE, 1956), was described from Is. Ryukyu (out of discussed area) ..... ***lili*** (SCOPOLI, 1763).
14. Abdominal sternites with a pair of blackish spots (sometimes fused) laterally. Length 7.0–12.0 mm. Distributed in Japan (Honshu, Shikoku, Kyushu) .....  
 ..... ***subpolita*** MOTSCHULSKY, 1860.  
 -. Abdominal sternites without blackish spots laterally ..... **15.**
15. Outer 1/4 of metasternum densely covered by whitish pubescence which forms an area of about same size as metaepisternum. Length about 7.0 mm. Known from Honshu only ..... ***balyi*** CHŪJŌ, 1962.  
 -. Outer 1/4 of metasternum glabrous or unevenly pubescent. Here specimens of *lateritia* (thesis 17) with entirely black legs.
16. Head entirely or almost entirely red ..... **17.**  
 -. Head black or bicolorous, at least labrum and genae black or dark brown ..... **19.**

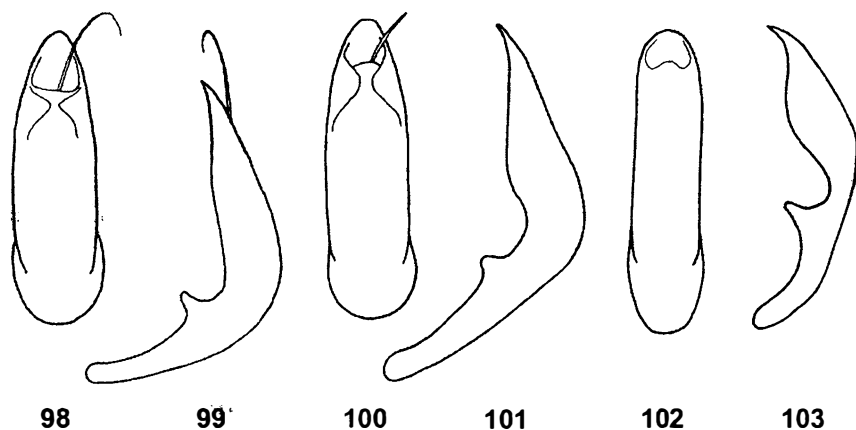


Figs 92-97. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 2003): 92, 93 – *Lilioceris schneideri*; 94, 95 – *Oulema tristis*; 96, 97 – *O. gallaeciana*.

17. Head entirely red. Upper side dark red, usually with weak metallic reflex. Abdomen entirely red or red brownish, without pattern. Legs black, femora usually on ventral and inner side red. Forms an unnamed aberration with entirely black legs. Outer 1/4 of metasternum densely covered by whitish pubescence. Length 7.0–8.0 mm (= *potens* WEISE, 1922, *smilacis* GRESSIT, 1942). Distributed in China and N Vietnam ..... ***lateritia*** (BALY, 1863).
- . Head red except narrow boarding of hind part of eyes ..... **18.**
18. On average larger, eyes less convex, surface of pronotum without impressions, primary punctation of elytra less deep. General view as in plate V, **phot. 44**. Aedeagus as in figs **88, 89**. Length 7.5–8.0 mm (= *cornuta* FALDERMANN, 1837, *semirufa* MARSEUL, 1868). Underside, antennae, palpi, tarsi and basal part of femora black, scutellum usually bicolorous, remaining parts of body red or reddish-yellow. One variation was described: hind part of pronotum with dark markings (ab. *notaticollis* PIC, 1934). Distributed in Balkan Peninsula, Asia Minor, Syria, Caucasian countries and Central Asia ..... ***faldermanni*** (GUÉRIN, 1829).
- . On average smaller, eyes strongly convex, surface of pronotum with three shallow impressions, primary punctation of elytra deeper. Length 6.8–7.5 mm. Remaining characters as in *faldermanni* (thesis 18), structure of genitalia also weakly differing. Described from Iran ..... ***chodjai*** BERTI et RAPILLY, 1976.
19. Head black. Body stout, strongly shining. Pronotum, Underside, legs and antennae black, elytra and abdomen light yellowish-red. Length 8.8 mm. Described from W Sichuan based on one specimen only ..... ***nobilis*** MEDVEDEV, 1958.
- . Head bicolorous ..... **20.**
20. Femora entirely black, tibiae red, darkened basally. Head black, occiput and frontal calli red. General view as in plate VI, **phot. 48**. Length 6.0–7.0 mm (= *alpina* REDTENBACHER, 1849). Variations: tibiae red or bicolorous (typical form), tibiae entirely black (ab. *nigripes* PIC, 1891). Occurs in Alps and their neighbouring areas, reported also from Spain ..... ***tibialis*** (VILLA 1838).
- . Femora red, basally and apically blackened ..... **21.**
21. Mandibulae red. Punctures of elytra finer and less regular. Legs more slender. General view as in plate VI, **phot. 49**. Aedeagus as in figs **90, 91**. Length 6.0–7.5 mm (= *brunnea* FABRICIUS, 1792, *laticollis* REITTER, 1893, *wagneri* JACOBSON, 1894, *laticollis* PIC, 1916). Several variations were described: pronotum posteriorly blackish (ab. *collaris* LACORDAIRE, 1845), antennae basally red (ab. *rufipes* HERBST, 1783), antennae almost entirely red (ab. *suffriani* SCHMIDT, 1842). No essential differences between this species and *sinica* HEYDEN, 1887 (= *chinensis* JACOBY, 1888, *theana* REITTER, 1898), perhaps the last-mentioned is a eastern form or race of *merdigera*. Distributed from Iberian Peninsula, France and southern Norway to Japan ..... ***merdigera*** (LINNAEUS, 1758).
- . Mandibulae black. Punctures of elytra stronger and more regular. Legs more robust. Aedeagus as in figs **92, 93**. Length 7.5–8.0 mm, remaining characters conform with *L. merdigera*. Distributed in eastern France, Italy, Germany and Hungary .... ***schneideri*** (WEISE, 1900).

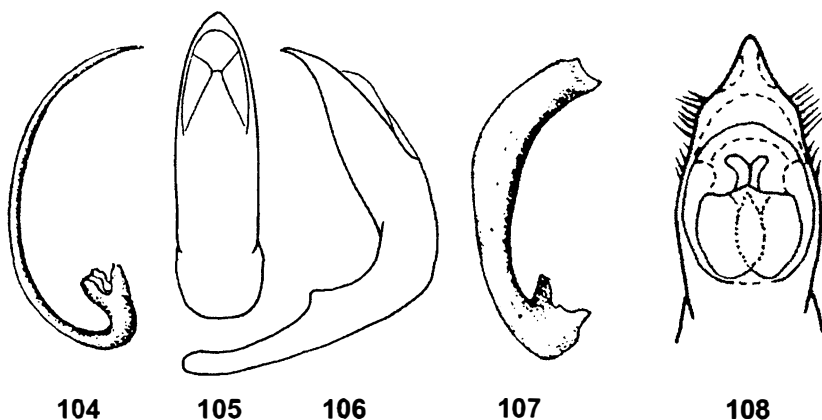
Key to species

1. Upper side entirely black, usually with a metallic lustre ..... 2.
- . Pronotum reddish or orange ..... 9.
2. Legs at least pale coloured ..... 3.
- . Legs entirely black ..... 4.
3. Pronotum finely and closely punctate laterally and sparsely dorsally. Femora and tibiae yellow with darkened tarsi. General view as in plate VI, **phot. 50**. Aedeagus as in figs **94, 95**. Length 3.5–4.0 mm (= *flavipes* SUFFRIAN, 1841). Distributional area forming a long and relatively narrow stripe, from eastern France to Japan ..... *tristis* (HERBST, 1786).
- . Pronotum finely and closely punctate on almost whole surface. Legs reddish brown. Length about 3.5 mm (= *kaimurai* OHNO, 1962). Distributed in N China, Korea and Japan (Honshu, Kyushu) ..... *dilutipes* (FAIRMAIRE, 1888).
4. Transverse groove in hind part of pronotum not punctate, but smooth or covered with short longitudinal grooves ..... 5.
- . Transverse groove in hind part of pronotum finely and rather deeply punctate ..... 6.
5. Elytra bluish black, remaining parts of body black without metallic lustre. Length 4.0–4.5 mm (= *lacordairei* DESBROCHERS, 1875, nec BALY, 1865). Described from Algeria. Probably a form of *L. hoffmannseggii* (thesis 10) ..... *algerica* PIC, 1892.
- . Upper side bluish black, underside black, usually without metallic lustre, scarcely but rather strongly punctate. General view as in plate VI, **phot. 52**. Aedeagus as in figs **99, 100**. Length 3.5–4.5 mm (= *lichenis* VOET, 1806). One variation was described: metallic lustre of upper side feeble, bronzy or absent (ab. *obscura* STEPHENS, 1829). Distributed in western, northern and central part of Europe, in the whole basin of Danube, in european Russia, western Siberia and in northern part of Central Asia ... *gallaeciana* (HEYDEN, 1870).



Figs 98-103. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1985 and orig.): 98, 99 – *Oulema erichsonii*; 100, 101 – *O. septentrionis*; 102, 103 – *O. hoffmannseggii*.

6. Length of body 3.5–3.7 mm. Pronotum narrowed in basal 1/3 of its length, lateral puncturation strong and dense (= *viridula* GRESSIT, 1942). Distributed in E Siberia and N China ..... ***pygmaea*** (KRAATZ, 1879).
- . Length of body over 4.0 mm. Pronotum narrowed in basal 1/4 or 1/5 of its length, lateral puncturation fine ..... 7.
7. Aedeagus (figs **98**, **99**) sharpened at apex. Length 4.0–4.5 mm (= *weisei* SEIDLITZ, 1891). One variation was described: body black, nearly without metallic lustre, pronotum very finely punctate, elytral rows rather confused (ab. *lipperti* GREDLER, 1866). This species is often confused with *O. septentrionis* (antithesis 8), therefore theirs areas of distribution are discussed together. The both species are distributed in central and northern Europe, from Spain and Ireland to Finland, northern Russia and basin of Volga ..... ***erichsonii*** (SUFFRIAN, 1841).
- . Aedeagus obtuse or rounded at apex ..... **8**.



Figs 104-108 (104, 107 after BERTI 1989; 105, 106 after WARCHALOWSKI 1985; 108 after MEDVEDEV 1993): 104 – *Oulema duftschmidi*, flagellum; 105, 106 – *O. melanopus*, aedeagus in dorsal and lateral view; 107 – *O. melanopus*, flagellum; 108 – *Afrophthalma antipaeformis*, apical half of aedeagus in dorsal view.

8. The whole surface of pronotum covered with fine and deep puncturation. Aedeagus broader. Length 4.0–4.2 mm. A very insufficiently studied species, only three specimens known. Distributed in Italy ..... ***magistrettiorum*** RUFFO, 1964.
- . Fine and deep puncturation cover only the hind part of pronotum. Aedeagus narrower (figs **100**, **101**). Length 4.0–4.5 mm. Distribution: see *O. erichsonii* (thesis 7). Often confused with *erichsonii* (*erichsonii*: alpine or subalpine populations in S and Central Europe, *septentrionis*: Fennoscandian populations) ..... ***septentrionis*** (WEISE, 1880).
9. Elytron pale, testaceous or dark yellowish with black sutural stripe and usually with lateral margins partly blackened. Legs pale, with partly darkened tarsi, antennae dark brown, 3–4 basal antennomeres pale. General view as in plate VI, **phot. 51**. Length 3.0–3.5 mm (= *downesi* BALY, 1865, nec BALY, 1863). Distributed in Indochina, China,

- Taiwan, Ryukyu Is. and Japan (Honshu, Shikoku, Kyushu) .....  
..... *atrosuturalis* (PIC, 1923).
- . Elytron black or black with metallic shine ..... **10.**
10. Legs black. General view as in plate VI, **phot. 53**. Aedeagus as in figs **102, 103**. Length 4.0–4.5 mm (= *purpuricollis* REICHE, 1861). A west-mediterranean species, distributed in southern France, Iberian Peninsula, Morocco and Algeria .....  
..... *hoffmannseggi* (LACORDAIRE, 1845).
- . Legs yellowish or reddish, tarsi black ..... **11.**
11. Pronotal puncturation rather close, not arranged in longitudinal rows or forming longitudinal confuse stripes. Basal antennomeres reddish. Length 3.9–4.5 mm. Distributed in China, Taiwan, Korea and Japan ..... *oryzae* (KUWAYAMA, 1931).
- . Pronotal puncturation sparse, in the central part arranged in longitudinal rows. Two or three species very similar to each other, distinguishable only by the structure of internal sclerite of aedeagus (flagellum). Their distribution and individual variability need a detailed revision, since in XIX century *O. duftschmidi* was synonymized with *O. melanopus* and only recently separated again ..... **12.**
12. Flagellum thick (fig. **107**). General view as in plate VI, **phot. 54**. Aedeagus as in figs **105, 106**. Length 4.3–5.3 mm (= *melanopa* LINNAEUS, 1761). Distributed in nearly whole western part of Palaearctis, but some parts of this area can be populated only by *L. duftschmidi* (see below). W Palaearctic species, distributed from Morocco, Ireland and S Norway to Near East, Central Siberia and Mongolia .....  
..... *melanopus* (LINNAEUS, 1758).
- . Flagellum thin (fig. **104**) ..... **13.**
13. General outline of body more stout. Ratio length/breadth of elytra less than 1.8. Length 4.0–4.8 mm. Antennae more robust. In opinion of some authors conspecific with *duftschmidi* (antithesis 13). Species usually confused with *melanopus* (thesis 12) and *duftschmidi*, its geographical distribution studied insufficiently .....  
..... *rufocyanea* (SUFFRIAN, 1847).
- . General outline of body more slender. Ratio length/breadth of elytra more than 2. Antennae finer. Length of body 4.2–5.0 mm. Species usually confused with *melanopus*, its geographical distribution requires revision .....  
..... *duftschmidi* (REDTENBACHER, 1874).



## Subfamily *Clytrinae*

### Key to genera

1. Posterior angles of pronotum a little bent up and elevated over humeral part of elytra. In male mandibulae always much larger than in female ..... **2**.
- Posterior angles of pronotum not elevate, situated in the plane of humeral part of elytra. If a little elevated, then mandibulae in male not or only insignificantly enlarged ..... **6**.
2. Pronotum bicolorous, black with broad reddish margins ..... *Cheilotoma* (p. 49).
- Pronotum unicolorous ..... **3**.
3. Pronotum black or black with metallic lustre ..... *Labidostomis* (part) (p. 72).
- Pronotum yellow, reddish or testaceous ..... **4**.
4. Elytra black or black with metallic lustre ..... *Chilotomina* (p. 51).
- Elytra testaceous sometimes with a black humeral spot ..... **5**.
5. Antennal segments 5–11 widened, saw-shaped ..... *Labidostomis* (part) (p. 72).
- Antennal segments 4–11 widened, saw-shaped ..... *Macrolenes* (p. 113).
6. Anterior coxa separated by a projection of prosternum ..... **7**.
- Anterior coxa contiguous ..... **9**.
7. Legs robust, anterior legs in male as long or only insignificantly longer than in female. Length of body above 7.0 mm ..... **8**.
- Legs moderately slender, anterior legs in male a little longer than in female. Length of body under 5.0 mm ..... *Melitonoma* (p. 114).
8. Elytral epipleura bare ..... *Clytra* (p. 53).
- Elytral epipleura pubescent. African and Arabian species ..... *Paraclytra* (p. 117).
9. Hairs covering body (in *L. puncticollis* underside only) shaggy. Elytra yellowish or reddish with black spots, pronotum and remaining parts of body always black ...  
..... *Lachnaia* (p. 108).
- Hairs covering underside of body not shaggy, pronotum nude, often red or bicolorous  
..... **10**.
10. Posterior angles of pronotum obtusely angulate ..... **11**.
- Posterior angles of pronotum rather broadly rounded ..... **12**.
11. Forms from E Asia ..... *Physosmaragdina* (p. 118).
- Forms from W Asia. Here Asiatic species of the genus *Afrophthalma* (antithesis 16).
12. Anterior margin of labrum rounded, truncate or very shallowly emarginate ..... **13**.
- Anterior margin of labrum more or less deeply emarginate or excavated ..... **14**.
13. Elytral epipleuron not strongly lobed. Lobes of tarsomeron 3 sharpened .....  
..... *Coptocephala* s. str. (p. 60).
- Elytral epipleuron strongly lobed. Lobes of tarsometon 3 rounded at apex .....  
..... *Aethomorpha* (p. 48).
14. Lobes of tarsomeron 3 sharpened. In male anterior part of head extremely deeply excavated .....  
..... *Otiotbraea* (p. 117).
- Lobes of tarsomeron 3 sometimes narrow, but always rounded at apex. In male anterior part of head not or insignificantly emarginate ..... **15**.
15. Pronotum very strong, densely, coarsely and deeply punctate. Elytra yellowish or reddish with black spots, remaining parts of body black. Species from Ibero-Mauritanian area ..... *Otioccephala* (p. 114).

- . Pronotum not particularly strong and densely punctate. Species from different parts of Palaearctic area ..... **16.**
- 16. Hind angles of pronotum rounded ..... **17.**
- . Hind angles of pronotum distinctly right ..... ***Afrophthalma*** (p. 48).
- 17. Sexual dimorphism in length of fore legs almost absent ..... ***Smaragdina*** (part) (p. 118).
- . Sexual dimorphism in length of fore legs distinct ..... **18.**
- 18. Upper side, whole or partly, metallic coloured ..... ***Smaragdina*** (part) (p. 118).
- . Upper side without metallic colouring ..... ***Tituboea*** (p. 131).

**Genus *Aetheomorpha* LACORDAIRE, 1848**

A Palaetropical genus, in Palaearctic area represented by one species only. Very small, relatively short, body pale testaceous or yellowish, underside usually darkened. On each elytron one blackish dot, in pale variations absent. Length 2.2–3.6 mm. Forms two subspecies: larger (2.4–3.6 mm), upper side always entirely pale (nominotypical subspecies from Senegal), smaller (2.2–2.4 mm) elytra often with black spot (subsp. *pumilio* LACORDAIRE, 1848 described from Egypt, known also from Arabian Peninsula) ...  
 ..... ***seminigra*** LACORDAIRE, 1848.

**Genus *Afrophthalma* MEDVEDEV, 1978**

An Ethiopian genus, in Palaearctic area represented by three species from Arabian Peninsula only.

Key to species

1. Upper side pale, elytron with a blue marginal elongate patch from the humeri along the lateral margin, much broader behind than in anterior part. Length 5.5 mm. Described from Aden ..... ***arabica*** (BRYANT, 1957).
- . Upper side differently coloured ..... **2.**
2. Frons strongly punctate, wider than maximal length of eye. Hind angles of pronotum obtusely angulate and slightly raised. Body yellowish, each elytron with transverse black spot in apical part. Pronotum sometimes slightly darkened. Aedeagus as in fig. **108**. Length 3.9–4.8 mm. Described from Saudi Arabia .....  
 ..... ***antipaeformis*** MEDVEDEV, 1993.
- . Frons finely punctate, not wider than maximal length of eye. Hind angles of pronotum rectangular, not raised. Body entirely yellowish except darkened apical part of antennae. Aedeagus not studied. Length 3.5–7.0 mm (= *miopristoides* BURGEON, 1942). Distributed in Palaetropical part of Africa and in Saudi Arabia .....  
 ..... ***filiformis*** LACORDAIRE, 1848.

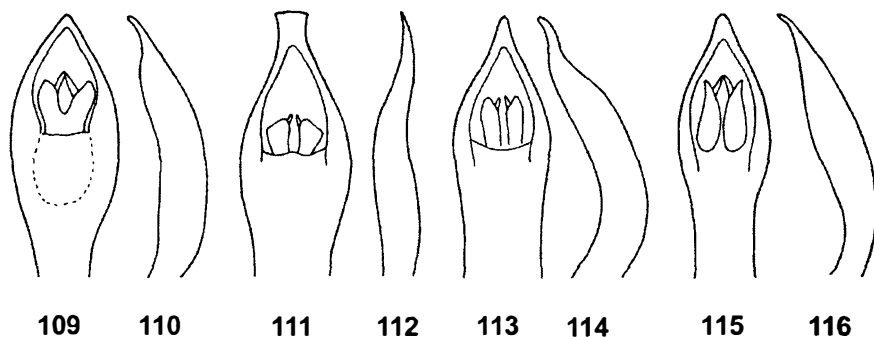
Key to subgenera

1. Mandibles much shorter than head. Elytra unicolorous ... *Cheilotoma* s. str. (p. 49).
- . Mandibles strongly elongate, almost as long as head. Elytra with pale apical spot ...  
..... *Exaesiognatha* (p. 50).

Subgenus *Cheilotoma* s. str.

Key to species

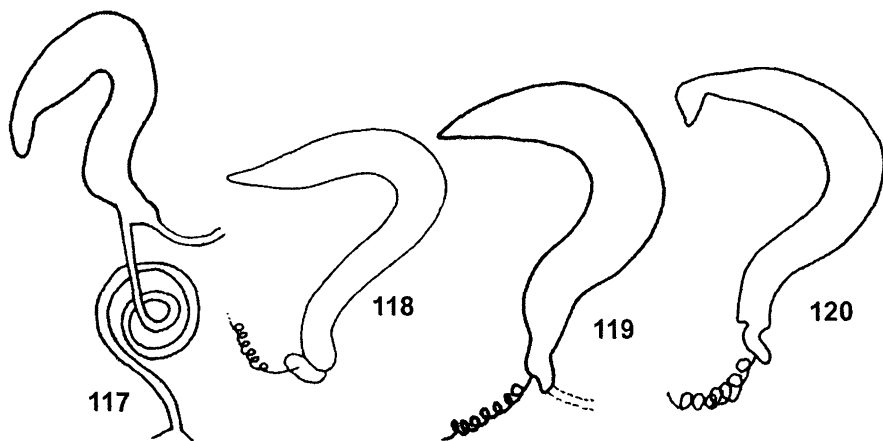
1. Pronotum entirely reddish-yellow ..... 2.
- . Pronotum reddish-yellow, his center black with metallic greenish-blue lustre. Femora basally and tarsi blackish, rest of legs reddish-yellow. Ductus spermathecae spirally coiled (figs **118**, **119**, **120**) ..... 3.



Figs 109-116. Apical part of aedeagus in dorsal and lateral view (after KASAP 1984): 109, 110 – *Cheilotoma fulvicollis*; 111, 112 – *C. erythrostroma*; 113, 114 – *C. muscifformis*; 115, 116 – *C. beldei*.

2. Legs pale, tarsi slightly darkened. Emargination of clypeus feebly trapeziform, its teeth straight. Head strongly punctate in its anterior part. Prothorax twice as broad as long. Female unknown. Length 4.0 mm. Described based on two males from SE Turkey ..... *voriseki* MEDVEDEV et KANTNER, 2003.
- . Tibiae apically and tarsal segments completely piceous-black, rest of legs reddish-yellow; emargination of clypeus strictly quadrangular, its teeth curved outside. Head weakly punctate in its anterior part. Ductus spermathecae not spirally coiled (fig. **117**). Aedeagus as in figs **109**, **110**. Length 3.4–4.2 mm. Known from Syria only .....  
..... *fulvicollis* SAHLBERG, 1913.
3. Clypeus U-like emarginate. Apex of aedeagus (figs **111**, **112**) widened and transversely truncate. Spermatheca as in fig. **118**. Length 5.0–7.0 mm (= *italica* LEONI, 1906). Variation: on pronotum black patch very extended, legs largely bluish black (ab.

- baudii* LEONI, 1906). Distributed in Italy, Bulgaria, Romania, Crimea, S Russia and Caucasian countries, reported also from Spain .....  
 ..... *erythrostroma* FALDERMANN, 1837.  
 -. Clypeus with quadrangular or deltoidal emargination. Apex of aedeagus pointed ....  
 ..... 4.



Figs 117-120. Spermatheca (after KASAP 1984): 117 – *Cheilotoma fulvicollis*; 118 – *C. erythrostroma*; 119 – *C. musciformis*; 120 – *C. beldei*.

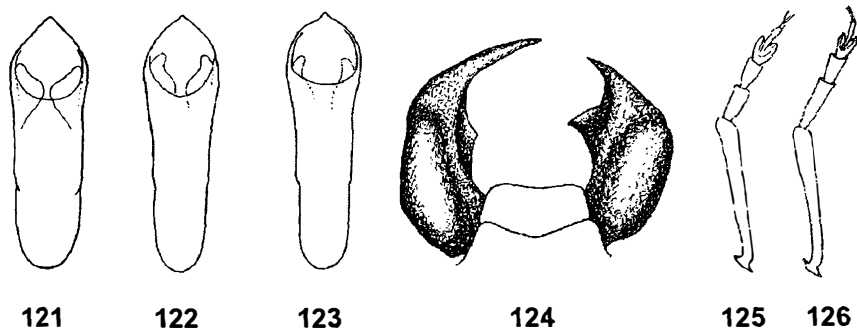
4. Emargination of clypeus quadrangular. General view as in plate VII, **phot. 55**. Aedeagus and spermatheca as in figs **113, 114, 119**. Length 3.8–5.3 mm (= *bucephala* SCHALLER, 1783, *muscooides* FOURCROY, 1785). Two subspecies were described: clypeus in male trapeziform, length usually over 5.0 mm (subsp. *iranica* MEDVEDEV, 2004 from Iran), lateral teeth of clypeus in male parallel-sided (subsp. *hispanica* MEDVEDEV, 2004 = *apennina* MEDVEDEV, 2004 from Iberian Peninsula and Italy). Variation, sometimes considered also as subspecies, having pronotum black with narrow reddish margins, ab. *siegae* MÜLLER, 1921, was described from NO Italy. Species distributed from N Spain, eastern France and northern Italy to Bulgaria, S Ukraine, Caucasian countries and Iran ..... *musciformis* (GOEZE, 1777).  
 -. Emargination of clypeus deltoidal. Aedeagus and spermatheca as in figs 411, 412, 419. Length 3.5–4.5 mm (= *ammanica* LOPATIN, 1995). Distributed in Turkey and Jordan ..... *beldei* KASAP, 1984.

Subgenus *Exaesiognatha* JACOBSON, 1923

One species only. Pronotum yellowish orange with black pattern in the middle. Elytra with bluish or greenish metallic sheen and with an yellowish-orange spot on the apex. Legs pale rust-reddish. Length 3.5–3.8 mm (= *turcomanica* MEDVEDEV, 1971). Distributed in Central Asia from Turkmenia to Tadzhikistan ..... *ivanovi* JACOBSON, 1923.

## Key to species

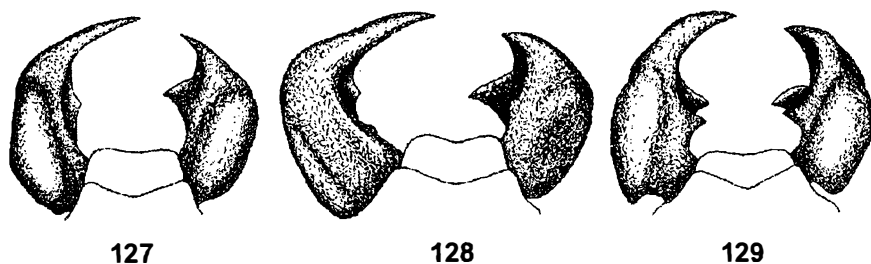
1. Male mandibulae much asymmetrical, apex of left mandibula long, spine-like, dorsal tooth on its inner side small or almost absent. N African species ..... **2**.
- Male mandibulae unequal, but not so much asymmetrical, apex of left mandibula shorter, dorsal tooth on its inner margin great and usually sharp (fig. 124). European species ..... **4**.
2. Mid and hind legs entirely dark, often blue-black. Fore legs almost entirely orange-yellow; trochanter and basis of femur blackish, tarsus sometimes slightly darkened. Sides of apical part of aedeagus rounded with small lamella (fig. 123). Length 4.1–4.7 mm (female) to 4.8–5.9 mm (male). Here probably also *Smaragdina rufimana* (LACORDAIRE, 1848) see genus *Smaragdina*, auxiliary group B, thesis 21, and *haskourensis* WARCHAŁOWSKI, 2000 = *viridipennis* COBOS, 1969 nec PIC, 1937. Distributed in Morocco and in (?) S Spain ..... **erberi** WARCHAŁOWSKI, 2000.
- All tibia orange-yellow ..... **3**.



Figs 121-126 (after WARCHAŁOWSKI 2000): 121-123 – aedeagus in dorsal view: 121 – *Chilotomina nigritarsis*; 122 – *C. bergeali*; 123 – *C. erberi*, *C. korbi* and *C. moroderi*; 124 – *C. erberi*, mandibulae of male; 125, 126 – fore tibia with tarsus: 125 – *C. bergeali*; 126 – *C. regalini*.

3. All legs orange-yellow, hind femora blackened basally, claw tarsomeres very slightly darkened. In male first tarsomere of fore legs about 2.5 times longer than broad (fig. 125). Swellings on mandibulae well-developed, strongly convex (fig. 127). Pronotum on all the surface sparsely, moderately strongly and rather irregularly punctate. General view as in plate VII, **phot. 56**. Length 4.5–5.3 mm. Sides of apical part of aedeagus very feebly rounded (fig. 122). Female unknown. Distributed in northern Algeria ..... **bergeali** WARCHAŁOWSKI, 2000.
- Legs orange-yellow, hind femora mostly blackish, in all legs last two or three tarsomeres blackish. In male first tarsomere of fore legs distinctly elongate, 3.5–4.0 times longer than broad (fig. 126). Swellings on right mandibula slightly flattened, on left mandibula feebly developed or limited to a more or less narrow ridge (fig. 128).

- Pronotum on anterior half very sparsely and moderately strongly punctate, in posterior half smooth. Length 4.1–4.7 mm. Sides of the apical part of aedeagus almost straight (as in *nigritarsis*, fig. 121). Distributed in Middle Atlas ..... **regalini** WARCHAŁOWSKI, 2000.
4. Legs orange-yellow, tarsi black. Pronotum strongly or (in anterior part) coarsely punctate ..... 5.
- . Legs darkened; fore tibiae dorsally, mid and hind tibiae almost entirely blackish or black. Pronotum finely or (in anterior part) moderately strongly punctate ..... 6.



Figs 127-129. Mandibulae of male (after WARCHAŁOWSKI 2000): 127 – *Chilotomina bergeali*; 128 – *C. regalini*; 129 – *C. moroderi*.

5. Pronotum at least anteriorly coarsely punctate. Length 4.5–7.5 mm (= *baetica* WEISE, 1881). Sides of apical part of aedeagus very feebly rounded or straight (fig. 121). Distributed in southern part of Spain ..... **oberthuri** (LEFÈVRE, 1872).
- . Pronotum rather strongly, but not coarsely punctate. Length 4.9–6.8 mm. Sides of apical part of aedeagus as in *oberthuri* (as in *nigritarsis*, fig. 121). Distributed in northern part of Spain and southern part of France ..... **nigritarsis** (LACORDAIRE, 1848).
6. In male swelling on right mandibula usually flattened. Length 4.5–6.0 mm. Sides of apical part of aedeagus rounded (as in *erberi*, fig. 123). Distributed in western Spain ..... **korbi** (WEISE, 1895).
- . In male swelling on right mandibula very convex fig. 129. Length 5.0–6.2 mm. Sides of apical part of aedeagus rounded (as in *erberi*, fig. 123). Distributed in S Spain ... **moroderi** (COBOS, 1961).

### Genus *Clytra* LAICARTING, 1781

Two species: *Clytra* (?*Clytrella*) *reductoapicalis* PIC, 1932: 35 (?China), nomen dubium and *C. hajeki* MEDVEDEV et KANTNER, 2002 from Iran, incertae sedis, perhaps another genus (*Paraclytra*?), not included in the key.

#### Key to subgenera

1. Pronotum entirely pure black ..... 2.

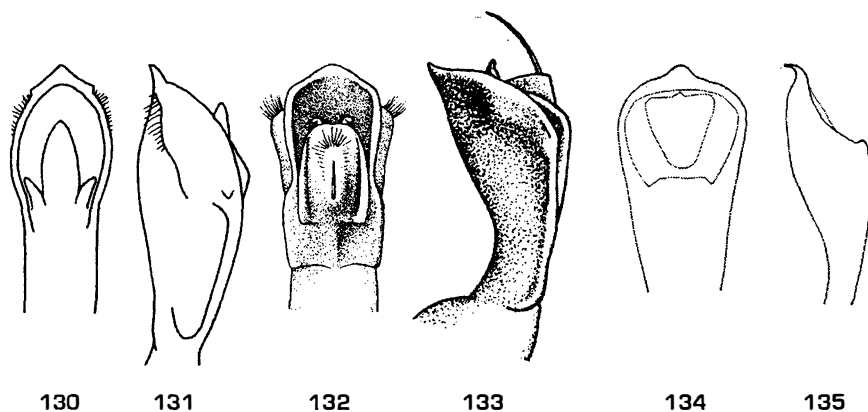
- Pronotum partly or entirely reddish, usually with black pattern (in some forms of *valeriana*, antithesis 6), very dark pitchy, almost black) (= *Clytrella* MEDVEDEV, 1961) ..... ***Clytraria*** (p. 56).
- 2. Body subcylindrical ..... ***Clytra*** s. str. (p. 53).
- Body somewhat oval ..... ***Ovoclytra*** (p. 58).

Subgenus ***Clytra*** s. str.

*C. incomperta*, *obesa* and *medvedevi*, here discussed as *Clytra* s. str., were originally described in other subgenera.

Key to species

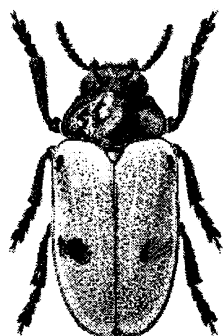
1. Lateral margins of pronotum, flattened, rather broad (particularly in posterior part), distinctly punctate ..... **9.**
- Lateral margins of pronotum not flattened, rather narrow, smooth, sometimes indistinctly punctate ..... **2.**
2. Lateral margins of pronotum very narrow, smooth ..... **3.**
- Lateral margins of pronotum not very narrow, indistinctly, somewhat rugosely punctate. Here three species very similar to each other, distinguishable only by the structure of aedeagus ..... **4.**



Figs 130-135. Aedeagus in dorsal and lateral view (130, 131 after WARCHALOWSKI 1991; 132, 133 after PETITPIERRE 2000; 134, 135 orig.): 130, 131 - *Clytra* (s. str.) *laeviuscula*; 132, 133 - *C. espanoli*; 134, 135 - *C. popovi*.

3. Anterior margin of aedeagus laterally angulate. Two black spots in posterior part of elytron usually joined, forming a short, transverse stripe. Aedeagus as in figs **130**, **131**. Length 7.5–11.5 mm (= *quadripuncta* LAICHARTING, 1781, *fasciata* RATZBURG, 1837 nec FABRICIUS, 1801). Forms two subspecies: apex of aedeagus triangularly protruding, body more slender (subsp. *afghanica* REINECK, 1937 = *incomperta* LOPATIN, 1966, described from Afghanistan, considered also as distinct species), apex of aedeagus shortly triangular, not protruding, body less slender (subsp. *nominotypica*).

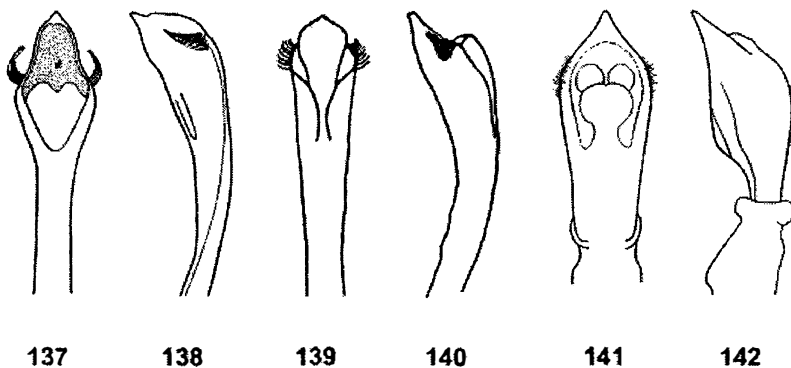
- † occurring in remain part of area). Variations: on each elytron humeral spot only (ab. *antistita* WEISE, 1889), two spots in posterior part of elytra free (ab. *biinterrupta* REITTER, 1912), in posterior part of elytron the transverse stripe free (typical form), on elytra the both transverse stripes joined on suture (ab. *connexa* FRICKEN, 1888). Distributed from France and England to Altai Range, reported also, perhaps erroneously, from Morocco ..... *laeviuscula* (RATZEBURG, 1837).
- . Aedeagus as in figs 132, 133, its apical margin laterally rounded. General view as in fig. 136. Remaining characters as in preceding species. Distributed in Iberian Peninsula, possibly a geographical form of *C. laeviuscula* .....  
 ..... *espanoli* DACCORDI et PETITPIERRE, 1977.



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Fig. 136 (after PETITPIERRE 2000): *Clytra* (s. str.) *espanoli*, general view.

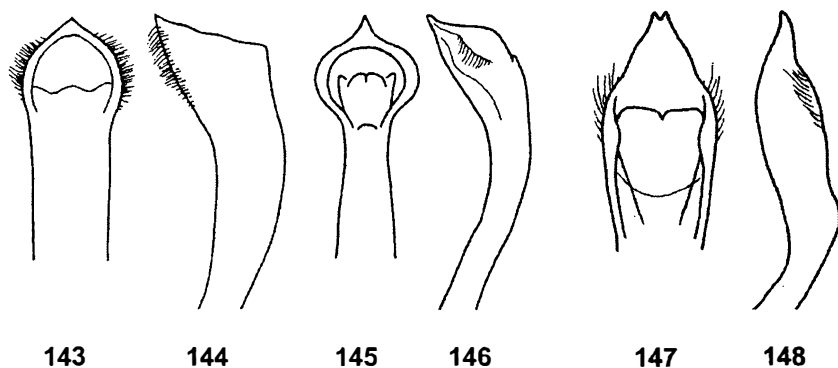
4. Apex of aedeagus rounded with short, semitriangular lamella (figs 134, 135), in lateral view its very tip crooked down, on underside runs sharp median ridge. General view as in plate VII, phot. 57. Length 7.0–10.5 mm. Described from Tadzhikistan ...  
 ..... *popovi* MEDVEDEV, 1961.
- . Apex of aedeagus with small, rounded lamella or without any distinct lamella .... 5.



Figs 137-142. Aedeagus in dorsal and lateral view (139, 140 after RAPILLY 1982, remaining after LOPATIN 1966): 137, 138 – *Clytra* (s. str.) *medvedevi*; 139, 140 – *C. obesa*; 141, 142 – *C. incomperta*.

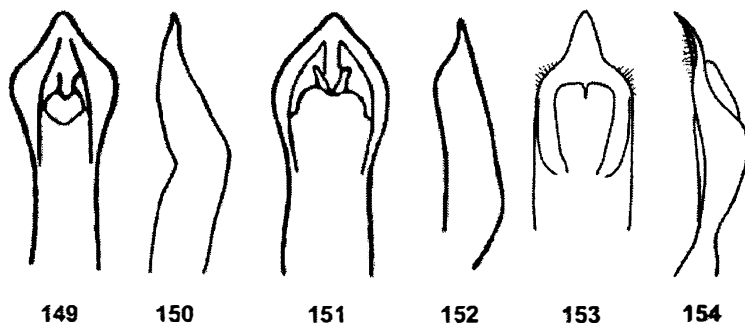


5. Black pattern on disc of elytra usually divided, reduced or absent, apical part of aedeagus laterally rounded as in *quadripunctata* (antithesis 9). Length 8.0–10.3 mm. Distributed in E Asia from Altai Range to Japan ..... ***arida*** WEISE, 1889.
- . Black pattern on disc of elytra usually not divided, apical part of aedeagus in dorsal view narrowed ..... **6.**



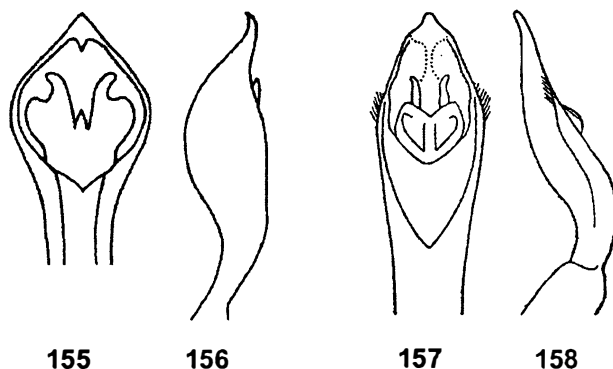
Figs 143-148. Apical half of aedeagus in dorsal and lateral view (143, 144 after WARCHAŁOWSKI 2003, remaining after WARCHAŁOWSKI 1991): 143, 144 – *Clytra* (s. str.) *aliena*; 145, 146 – *C. quadripunctata*; 147, 148 – *C. (Clytraria) atraphaxidis*.

6. Apex of aedeagus (figs 141, 142) triangular, aedeagus on underside with high elevated, sharp ridge. Pronotum in hind part finely punctate. Length 9.2–9.5 mm. Described from Afghanistan ..... ***incompta*** LOPATIN, 1966.
- . Apex of aedeagus not triangular ..... **7.**
7. Preapical part of aedeagus broadened or almost parallel, but not distinctly rounded ...  
..... **8.**
- . Preapical part of aedeagus laterally rounded ..... **9.**



Figs 149-154. Apical half of aedeagus in dorsal and lateral view (153, 154 after WARCHAŁOWSKI 1991, remaining after MEDVEDEV, 1962): 149, 150 – *Clytra (Clytraria) opaca*; 151, 152 – *C. rufina*; 153, 154 – *C. valeriana*.

8. Apical part of aedeagus (figs **137**, **138**) longer. Length 9.0–10.0 mm. Described from Afghanistan ..... **medvedevi** LOPATIN, 1966.  
 –. Apical part of aedeagus (figs **139**, **140**) shorter. Length 9.8–10.8 mm. Described from SE Iran ..... **obesa** RAPILLY, 1982.



Figs 155–158. Apical half of aedeagus in dorsal and lateral view (155, 156 after WARCHAŁOWSKI 1991; 157, 158 after LOPATIN 1980): 155, 156 – *Clytraria (Clytraria) novempunctata*; 157, 158 – *C. jelineki*.

9. Aedeagus as in figs **143**, **144**; lateral grooves very deep, flagellum very long and thin, overhanging. General view as in plate VII, **phot. 58**. Length 9.0–10.0 mm. Known from Asia Minor only ..... **aliena** WEISE, 1897.  
 –. Aedeagus as in figs **145**, **146**; lateral grooves shallow, flagellum not visible. General view as in plate VII, **phot. 59**. Length 7.0–11.0 mm (= *quadrisignata* MÄRKEL, 1842, *messae*, MÜLLER, 1921, *latina* MÜLLER, 1951). Variations: lateral margins of pronotum broadly flattened (typical form), lateral margins of pronotum flattened, but moderately broad (ab. *appendicina* LACORDAIRE, 1848, considered to be a distinct species by some authors), on each elytron humeral spot only (ab. *dissimilis* WEISE, 1889), pronotum hairy (ab. *puberula* WEISE, 1898), punctuation of lateral borders very fine (ab. *turfanica* LOPATIN, 1962 described from China, perhaps a local form, by some authors considered as a subspecies). Distributed in the major part of Western Palaearctic, from northern Spain and Ireland to Mongolia ..... **quadripunctata** (LINNAEUS, 1758).

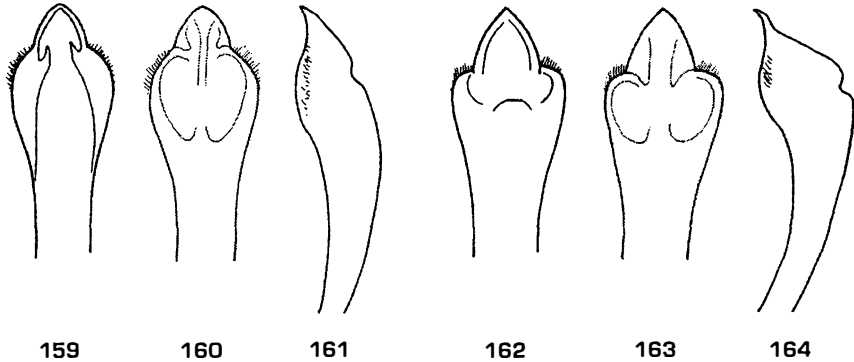
#### Subgenus *Clytraria* SEMENOV, 1903

*Clytrella* MEDVEDEV, 1961.

#### Key to species

1. Pronotum with 2–5 small black spots. Elytra always yellowish or reddish with black pattern ..... **2**.  
 –. Pronotum with large central longitudinal black stripe. Black colour sometimes strongly expanded (ground of elytra black, with subbasal and subapical, sometimes

also central bands reddish). Usually elytra reddish with a large black humeral spot and large black transverse band behind middle. Pronotum reddish with very broad, longitudinal black stripe in central part. General view as in plate VII, **phot. 60**. Body very small, its length 4.0–5.0 mm (= *nuristanica* LOPATIN, 1966). Perhaps a species not congeneric with *Clytra*, originally described in genus *Miochira* LACORDAIRE, 1848, similarly as the subspecies *thibetana*, PIC, 1927. Distributed in Himalaya and in neighbouring area of Tibet ..... *montana* JACOBY, 1895.



Figs 159-164. Apical half of aedeagus in dorsal, ventral and lateral view (160, 163 after MEDVEDEV 1962, remaining after WARCHAŁOWSKI 2003): 159-161 – *Clytra (Ovoclytra) weisei*; 162-164 – *C. bodemeyeri*.

2. On anterior part of elytron two spots, sometimes joined forming an oblique stripe. General view as in plate VII, **phot. 61**. Aedeagus as in figs **147, 148**. Length 8.0–10.0 mm. This species forms a few subspecies in Central Asia and in the Far East: head or at least vertex red (subsp. *maculifrons* ZOUBKOFF, 1833 from Transcaspia and Iran), tibiae in male red, in female black, length of body 6.0–8.3 mm (subsp. *asiatica* CHŪJŌ, 1941, from China and Korea, often considered as a distinct species), pronotum at hind angles distinctly punctate (subsp. *punctata* WEISE, 1890, from Altai, Mongolia and N China). Variation: legs partly red, black elytral spots partly fused (ab. *milliati* PIC, 1942). Numerous other variations were described, partly as local forms; their systematic and taxonomic position needs a critical revision. A dark variation (ab. *sierrana* DANIEL, 1903, described also as a subsp. *cobosi* TIBERGHEN, 1969) is known from Alpujarra (plate VII, **phot. 62**). Distributed from Spain, Corsica, Sicily, S Italy and Greece to Central Asia, Mongolia and Korea ..... *atraxidid* (PALLAS, 1773).
  - In anterior part of elytron humeral spot only ..... **3.**
  - 3. Legs entirely or partly red ..... **4.**
  - Legs black, sometimes tibiae on underside reddish only ..... **6.**
  - 4. Black dot before scutellum absent ..... **5.**
  - Black dot before scutellum present. Head, underside and pygidium black, tibia and tarsi red, femora usually black. General view as in plate VII, **phot. 63**. Length 9.0–13.3 mm (= *jacobsoni* SEMENOV, 1903 *bucharica* PIC, 1915). Aedeagus as in figs **149, 150**. Distributed in Tadzhikistan ..... *opaca* JACOBSON, 1898.

5. Head, pronotum and legs entirely red, on elytra two hind spots usually fused. Length 5.6–8.0 mm. Aedeagus as in figs **151, 152**. Distributed in Central Asia ..... *rufina* SOLSKY, 1882.
- . On pronotum two black spots. On each elytron one black humeral spot and two small spots in midlength. General outline of body as in *atraxididis* (thesis 2). A variation (ab. *persica* PIC, 1920) of *novempunctata* (thesis 7), described from Iran.
6. On pronotum, in addition to a transverse row of 2 or 4 black spots, a little longitudinal black spot before scutellum ..... 7.
- . Black spot before scutellum absent. General view as in plate VIII, **phot. 64**. Aedeagus as in figs **153, 154**. Length 8.5–12.5 mm (= *valeriana* LACORDAIRE, 1848, *dissimilithorax* DESBROCHERS, 1870). Forms a few geographical forms: pronotum red with 2 or 4 black spots (*valeriana* s. str., from Asia Minor and Caucasian countries), pronotum with great, blurred, black spot (subsp. *tetrastigma* SCHMIDT, 1841 from Greece and Bulgaria), pronotum black, body slender (subsp. *taurica* MEDVEDEV, 1961 from Crimea), pronotum black, elytra reticulated (subsp. *iranica* MEDVEDEV, 1961 from Central Asia), elytra matt (subsp. *opacipennis* LOPATIN, 1962, from Caucasus). Variations: pronotum red without black marking (ab. *drurei* PIC, 1920 described from Iraq), pronotum with two great black spots (ab. *tetrastigma* SCHMIDT, 1841), on elytra posterior black spots fused (ab. *subjuncta* PIC, 1920 described from Anatolia). Distributed in Greece, Serbia, Bulgaria, Caucasian countries, Middle East and Central Asia. Known also from Sicily ..... *valeriana* (MÉNÉTRIÉS, 1832).
7. Upper side shining. General view as in plate VIII, **phot. 65**. Aedeagus as in figs **155, 156**. Length 6.0–9.0 mm (= *elegans* FALDERMANN, 1837, *globulosa* LEFÈVRE, 1872, *elata* WEISE, 1881). Variations: ground colour of upper side saturated red (ab. *aleppensis* REDTENBACHER, 1843), on each elytron black spots fused (ab. *juncta* PIC, 1920), pronotum for the most part black (ab. *signicollis* WEISE, 1900) see thesis 5 (ab. *persica* PIC, 1920). Distributed in SE Europe (E Balkan, Romania, S Ukraine, S Russia, Caucasian countries, Asia Minor and Central Asia. Known also from Sicily ..... *novempunctata* OLIVIER, 1808.
- . Upper side matt. Externally similar to *opaca* (antithesis 4), but legs black and aedeagus (figs **157, 158**) differently shaped. Length about 10.5 mm. Described from Iran ..... *jelineki* LOPATIN, 1980.

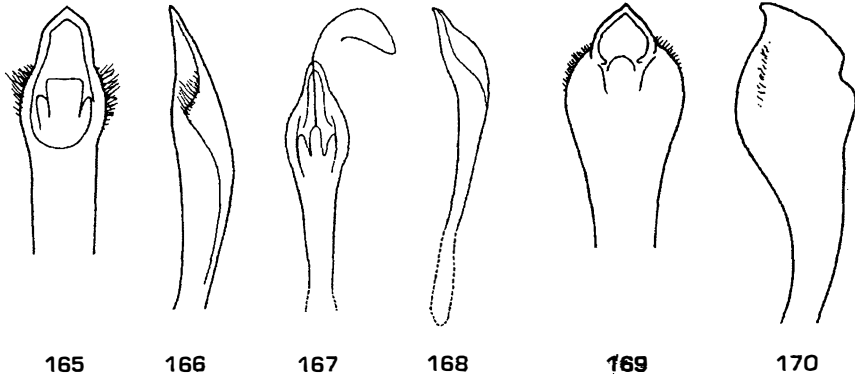
#### Subgenus *Ovoclytra* MEDVEDEV, 1961

##### Key to species

1. Transverse stripes in posterior part of elytra fused on suture ..... **2**.
- . Transverse stripes in posterior part of elytra free ..... **3**.
2. Length of body usually 9.0–10.5 mm (= *cingulata* WEISE, 1898, nec LATREILLE, 1811). Transverse stripes in posterior part of elytra almost always very broad. General view as in plate VIII, **phot. 66**. Aedeagus as in figs **159–161**. Distributed in Asia Minor and Middle East ..... *weisei* MONRÓS, 1953.
- . Length of body usually 6.5–8.0 mm. Transverse stripes in posterior part of elytra variabel. General view as in plate VIII, **phot. 67**. Aedeagus as in figs **162–164**. Forms two subspecies: humeral spot present, in male fifth abdominal sternite

shallowly but distinctly cut out (subsp. *bodemeyeri* s. str. from Asia Minor), humeral spot absent, in male fifth abdominal sternite normally truncate (subsp. *arabica* MEDVEDEV, 1961 from Mesopotamia). Distributed in Asia Minor and in Mesopotamia ...

- ..... *bodemeyeri* WEISE, 1900.
- 3. Length of body over 11.0 mm. Aedeagus as in figs **165**, **166** (= *laticollis* WEISE, 1889, nec OLIVIER, 1808). Distributed in Greece, Rhodos and in S Anatolia .....  
..... *binominata* MONRÓS, 1953.
- Length of body under 10.5 mm ..... **4**.
- 4. Body broadly oval, elytra rounded laterally. On each elytron a little humeral spot and a transverse spot (sometimes strongly reduced) behind middle. Pronotum very fine, but distinctly punctate. Aedeagus as in figs **167**, **168**. Length 8.0–10.0 mm. Forms three ?subspecies: smaller, about 7.0–8.0 mm, body outline rounded (nominotypical subspecies, distributed in south part of area, in Lebanon, Israel and basin of law Euphrat = *unifasciata* MÉNÉTRIÉS), larger, usually over 9.0 mm, body outline not strongly rounded, black pattern on elytra well-developed (subsp. *borealis* MEDVEDEV et KANTNER, 2002 distributed in north part of area, in S turkey and N Syria), larger, usually over 9.0 mm, outline of body strongly rounded, black pattern on elytra feebly developed or absent (subspecies *rotundata* MEDVEDEV, 1961 from Cyprus, considered often as a distinct species). Distributed in Near East ..... *ovata* (LACORDAIRE, 1848).
- Body not particularly broad. Pronotum smooth, indistinctly, extremely finely punctate ..... **5**.



Figs 165-170. Apical half of aedeagus in dorsal and lateral view (167, 168 after MEDVEDEV 1992, remaining after WARCHAŁOWSKI 2003): 165,166 – *Clytra (Ovoclytra) binominata*; 167, 168 – *C. ovata*. 169, 170 – *C. nigrocincta*.

- 5. Length of body usually 6.0–8.0 mm. Here variations of *C. bodemeyeri* (antithesis 2) with elytral stripes free.
- Length of body usually 8.0–10.0 mm (= *unifasciata* MÉNÉTRIÉS, 1836, nec OLIVIER, 1791). Pronotum black, elytra dark yellow with black humeral spot and broad, transverse, common stripe in posterior part. Body more slender. General view as in plate VIII, **phot. 68**. Aedeagus as in figs **169**, **170**. Variations: on each elytron

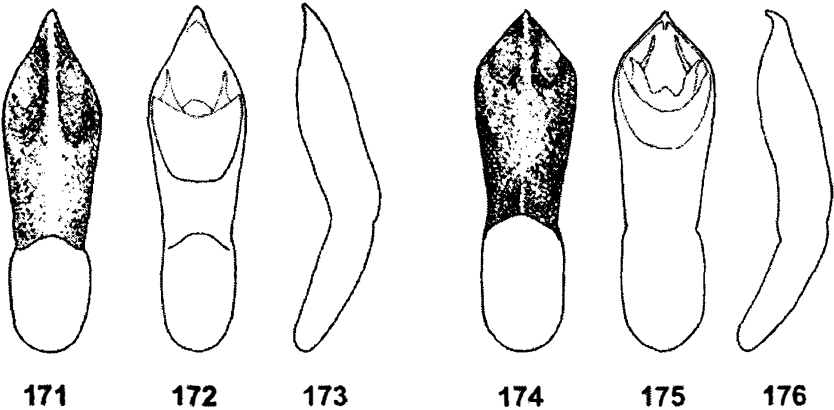
three little black dots (ab. *subinterrupta* PIC, 1920), on each elytron four little black dot (ab. *cyprica* PIC, 1918), the transverse stripe in posterior part of elytron straight, short and narrow (ab. *semireducta* PIC, 1918, *bagdatensis* PIC, 1920), in posterior part of elytron three or four black spots (ab. *multipunctata* PIC, 1920). Distributed in eastern Turkey, Syria, Iraq, Transcaucasia and northern Iran .....  
 ..... ***nigrocincta*** (LACORDAIRE, 1848).

Genus ***Coptocephala*** CHEVROLAT, 1836

Genus *Coptocephala* is divided into four or five subgenera, distributed in Palaearctic and Paletropical areas. In the discussed area nominotypical subgenus only. Two doubtful species: *Coptocephala arcasi* BAGUENA, 1958 from (?Spain) and *cheni* PIC, 1943 from China are not included in the key.

Key to species

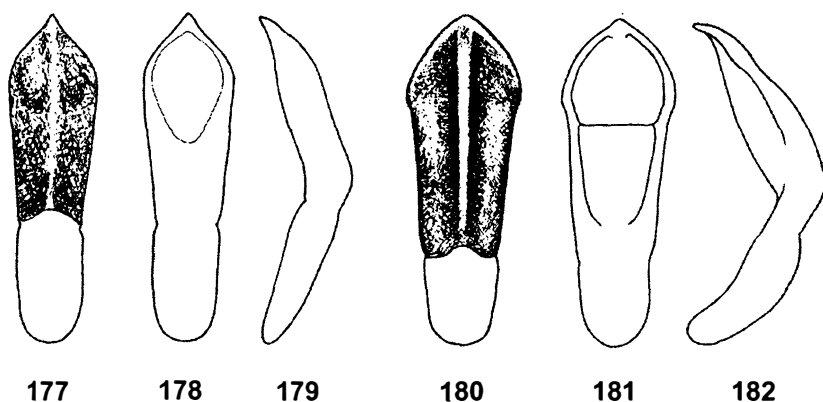
- 1. Upper side reddish with black pattern, or (very rarely) entirely reddish ..... 2.
- Elytra black with metallish lustre, sometimes with reddish lateral margin or/and with a reddish apical spot ..... 39.
- 2. Each elytron with four black spots: two basally, one (transverse) behind the middle and one (small) preapically. A doubtful species, described from Tunisia based on one female only, perhaps a variation of *aeneopicta* (thesis 6) .....  
 ..... ***demoflysi*** NORMAND, 1947.
- On elytra no preapical spots ..... 3.



Figs 171-176. Aedeagus in dorsal, ventral and lateral view (after WARCHALOWSKI 1991): 171-173 - *Coptocephala panousei*; 174-176 - *C. aeneopicta*.

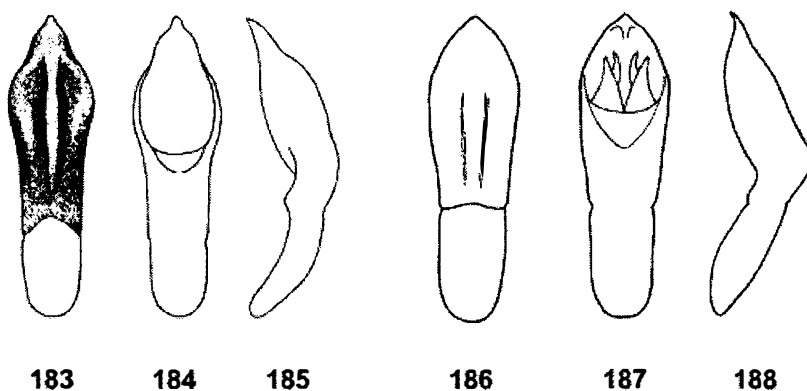
- 3. In male left mandibula long, sharply pointed, sickle-like, projecting ahead ..... 4.
- In male left mandibula formed normally, not projecting ahead ..... 9.

4. Elytra and pronotum strongly, relatively deeply punctate. Elytra fulvous with a dark blue transverse basal band and an oblique, great postmedian dark blue spot. Legs dark brown or blackish, basal part of tibiae reddish-brown ..... **5**.
- Punctures on elytra nor particularly strong, punctures on pronotum much finer, sparse, here and there almost entirely disappearing ..... **6**.
5. Length 3.2–3.8 mm. Aedeagus as in figs **511–513**. General view as in plate VIII, **phot. 70**, variations as in figs **171–173**. Species distributed in Morocco, Algeria and ?Tunisia ..... **panousei** KOCHER, 1958.
- Length 4.0 mm. Species from Israel, described based on one female only ..... **furthi** MEDVEDEV, 1992.
6. Tibiae entirely reddish or slightly darkened apically. Aedeagus as in figs **174–176**. Length 3.5–4.8 mm. General view as in plate VIII, **phot. 69**. Black pattern on elytra, more important variations and their names as in figs **195–198**. Distributed in Morocco and Algeria ..... **aeneopicta** (FAIRMAIRE, 1869).
- Legs entirely black or pitchy brown ..... **7**.
7. In male tibiae insignificantly thickened. Aedeagus as in figs **177–179**. Length 3.8–4.8 mm. Variation: on elytron anterior spot strongly extended (ab. *extensa* BAGUENA, 1960). Distributed in Iberian Peninsula ..... **brevicornis** (LEFÈVRE, 1872).
- In male tibiae strongly thickened. Length of body 3.7–5.5 mm ..... **8**.
8. Aedeagus as in figs **180–182**, spermatheca as in fig. **471**. Length 3.7–5.5 mm (= ?*dilatipes* PIC, 1923). General view as in plate VIII, **phot. 71**. Variations and their names see figs **201–204**. Nominotypical form distributed in Morocco and Algeria. In Afghanistan occurs a larger (6.0 mm) form, externally very similar to *unifasciata* (thesis 10) ?subsp. *vavilovi* LOPATIN, 1966, moreover from Iran is described ?subsp. *iranica* MEDVEDEV, 1971, reported also from Arabian Peninsula. The both Asiatic forms, having not thickened tibiae, belong probably not here ..... **crassipes** LEFÈVRE, 1876.
- Aedeagus as in figs **183–185**. Externally similar to *crassipes*, length 4.0–4.5 mm (= *jaechi* WARCHAŁOWSKI, 1991). Distributed in Near East (Sinai, Israel, Syria, Iraq) ... **coptocephaloides** LACORDAIRE, 1848.



Figs 177-182. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1991): 177-179 – *Coptocephala brevicornis*; 180-182 – *C. crassipes*.

9. In male dorsal margin of madibula deeply incised ..... **10**.  
 -. In male dorsal margin of mandibula almost straight ..... **11**.
10. Labrum entirely orange. In legs at least basis of tibiae reddish. Aedeagus as in figs **186–188**. Length 4.0–5.5 mm (= *femoralis* KÜSTER, 1845). Variations see figs **266, 267**. In discussed area occurs as geographical forms: head (except labrum) entirely black (subsp. *unifasciata* s. str. and subsp. *destinoi* see thesis 17), labrum and clypeus (sometimes partly) red, remaining parts of head black (ab. *phenax* JACOBSON, 1896 from basin of Volga), see also thesis 17. Very widely distributed from northern Spain and Belgium to Middle East, central Asia and Mongolia .....  
 ..... *unifasciata* (SCOPOLI, 1763).
- . Labrum black or at least with a dark spot in the middle. Legs entirely black, tibiae sometimes brown. Aedeagus as in figs **189–191**, spermatheca as in fig. **230** Length 5.0–6.0 mm (= *quadrimaculata* LINNAEUS, 1767, nec LINNAEUS, 1758). Variations (figs **211–214**): anterior transverse stripe divided into two spots (ab. *barcinonensis* BAGUENA, 1960), both transverse stripes divided, each into two spots (ab. *catalaunica* BAGUENA, 1960). Often confused with *C. scopolina* (thesis 36). Distributed in northern Spain, France, north-eastern Italy and western Germany .....  
 ..... *linnaeana* PETITPIERRE et ALONSO-ZARAZAGA, 2000.

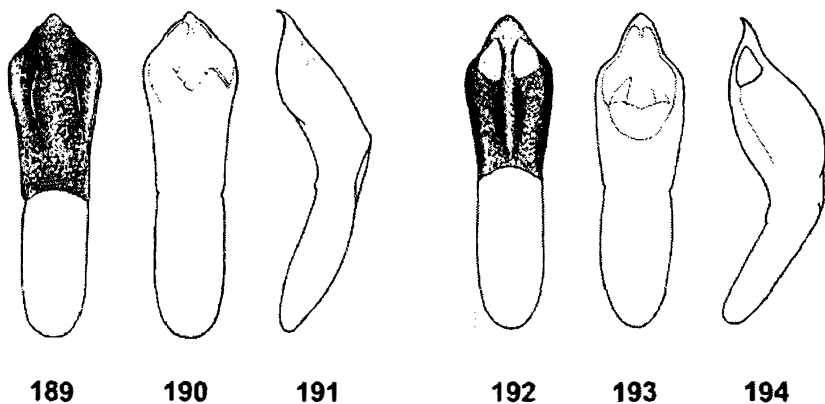


Figs 183-188. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1991): 183-185 - *Coptocephala coptocephaloides*; 186-188 - *C. unifasciata*.

11. Aedeagus on underside apically with two whitish, membraneous „windows“ ..... **12**.  
 -. Aedeagus on underside without „windows“ ..... **13**.
12. Legs always entirely black. Underside of aedeagus (figs **192–194**) with longitudinal edge, ductus spermathecae very thick and short (fig. **229**). Length 4.2–6.0 mm (= *tetradyma* KÜSTER, 1845). Variations and their names as in figs **235–240**. Form from eastern part of distribution area with large oblique anterior spot on elytron was described as subsp. *rossica* MEDVEDEV, 1977, but rather identical with the form *vittata* (fig. **235**). Distributed in Central and Eastern Europe, reported also from France and Pyrenees ..... *rubicunda* (LAICHARTING, 1781).



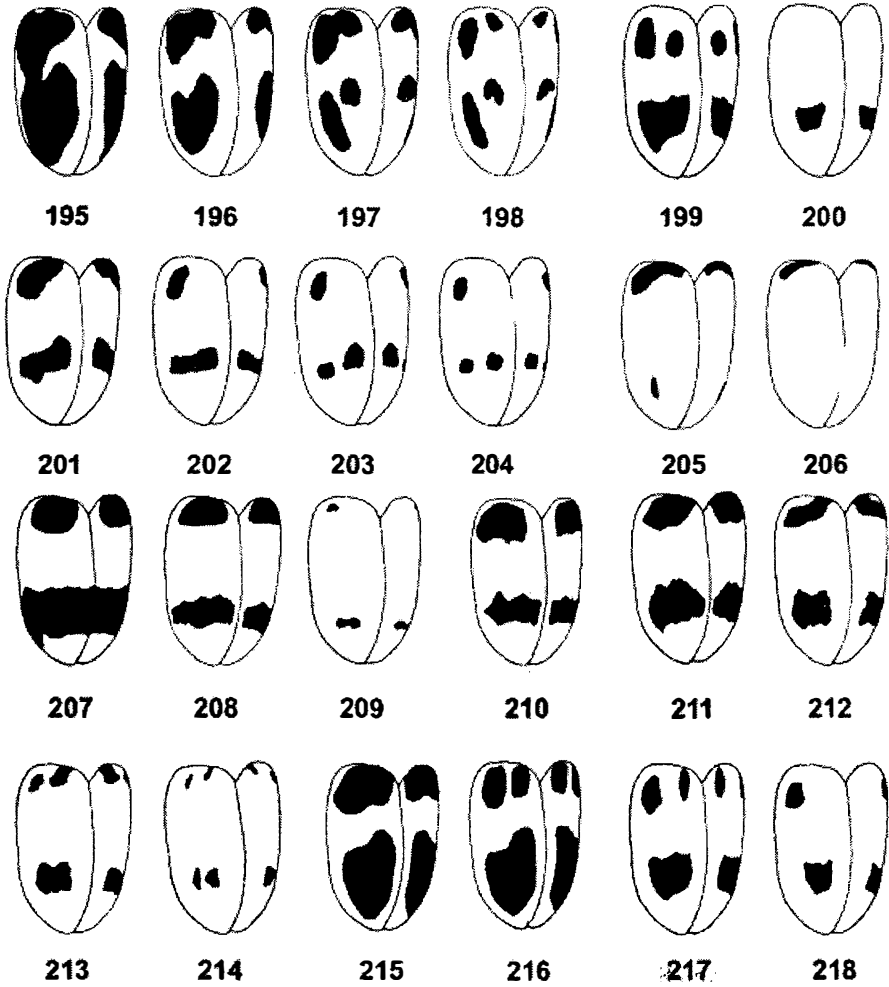
- Legs variously coloured, sometimes entirely black, but usually bicolorous. On each elytron two transverse black stripes with very feeble bluish or aeneous metallic reflex, in variations (figs 207–209) more or less reduced. Underside of aedeagus (figs 220–221) without longitudinal edge. Spermatheca (fig. 228) formed differently. Length 4.2–6.0 mm. Distributed in Greece ..... *hellenica* WARCHAŁOWSKI, 1991.
- 13. Labrum orange-red ..... 14.
- Labrum black ..... 27.



Figs 189-194. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1991): 189-191 – *Coptocephala linnaeana*; 192-194 – *C. rubicunda*.

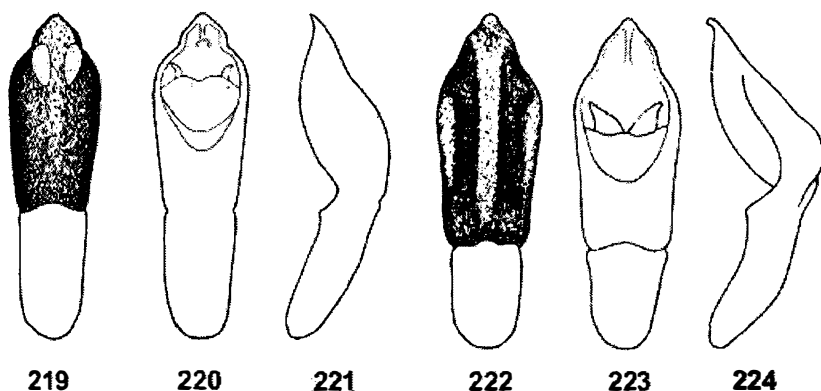
- 14. Underside of aedeagus (figs 222–224) with broad ridge along the middle and with two longitudinal impressions laterally. Black pattern on elytra usually largely reduced (typical form) or absent (ab. *vitalei* PIC, 1913). Legs brown or black. Length 4.8–6.5 mm. Distributed in Sicily, southern Italy and Dalmatia ..... *fossulata* LEFÈVRE, 1872.
- Aedeagus formed differently ..... 15.
- 15. Underside of aedeagus evenly convex, with very shallow impressions only. Black pattern on elytra largely reduced or absent. A rare variation of *C. scopolina floralis* (see thesis 31) from Spain.
- Aedeagus formed differently ..... 16.
- 16. Labrum red, remaining parts of head black ..... 17.
- Not only labrum, but also clypeus or front and clypeus, sometimes even whole the head reddish ..... 19.
- 17. Ventral side of aedeagus (figs 186–188) with two ridges. Length 4.3–5.7 mm. (= *intermedia* REINECK, 1908). Variation: black spots in anterior part of elytra absent (ab. *tambei* PIC, 1942). Distributed in Asia Minor and Syria. Probably a distinct species ..... *unifasciata destinoi* FAIRMAIRE, 1884.
- Ventral side of aedeagus with one ridge ..... 18.

18. Ventral ridge of aedeagus simple, gently convex. Length 6.0–7.5 mm (= *judaea* MEDVEDEV, 1992). Distributed in Near East (S Turkey, Syria, Israel) ..... *fallaciosa* FAIRMAIRE, 1884.  
 -. Length 4.0–5.0 mm. Ventral ridge of aedeagus double, narrow. Distributed in Asia Minor ..... *simillima* LODEWYCKX, 1995.



Figs 195-218. Elytral pattern (after WARCHAŁOWSKI 1991): 195-198 – *Coptocephala aeneopicta*: 195 – ab. *bistriuncta* PIC, 1905; 196 – ab. *biskrensis*; PIC, 1918; 197 – typical form; 198 – ab. *biinterrupta*, PIC, 1918. 199, 200 – *C. bistrinotata*: 1999 – typical form, 200 – ab. *espanoli* PIC, 1933. 201-204 – *C. crassipes*: 201 – ab. *rungsi* PIC, 1953; 202 – ab. *leprieuri* PIC, 1897; 203 – ab. *kocheri* PIC, 1953; 204 – typical form; 205, 206 – *C. cyanocephala*: 205 – ab. (unnamed), 206 – typical form; 207-209 – *Coptocephala hellenica*: 207 – typical form, 208, 209 – variations (unnamed); 210 – *C. kerimi*; 211-214 – *C. linnaeana*, variations (unnamed); 215, 216 – *C. panousei*, variations (unnamed); 217, 218 – *C. plagiocéphala*: 217 – typical form; 218 – ab. *externepunctata* PIC, 1895.

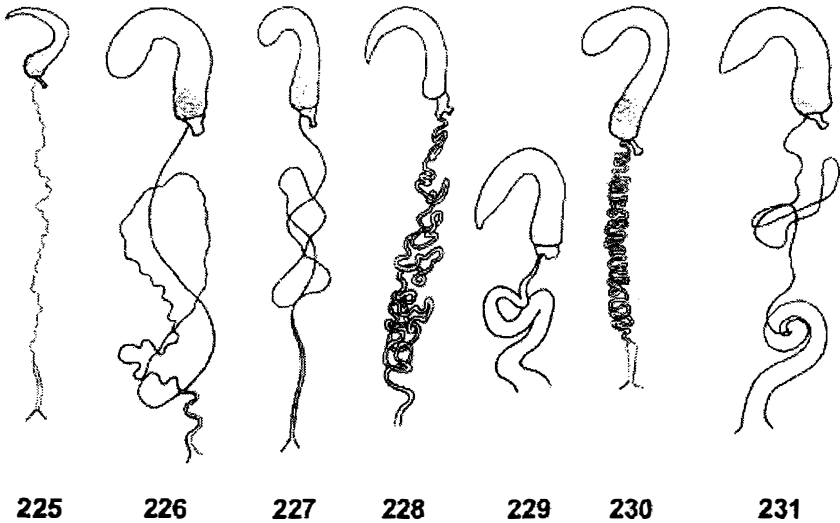
19. Forms from eastern part of the Mediterranean area (east-southern Europe, Middle East, Asia Minor) and central Asia ..... **20**.  
 -. Forms from northern Africa ..... **25**.  
 20. Head entirely red ..... **21**.  
 -. Head partly black ..... **22**.  
 21. External characters and aedeagus as in *unifasciata* s. str. (thesis 10). Probably identical with subsp. *australis* (antithesis 23). Described from Transcaspia ..... *unifasciata deserta* MEDVEDEV, 1965.  
 -. On elytra hind spot present only. Outline of aedeagus in dorsal view differs from nominotypical form. Described from Iran, recently considered as a distinct species ... *unifasciata postmaculata* LOPATIN, 1980.



Figs 219-224. Aedeagus in dorsal, ventral and lateral view (after WARCHALOWSKI 1991): 219-221 – *Coptocephala hellenica*; 222-224 – *C. fossulata*.

22. Black pattern on upper side pure black or (usually) with weak bluish reflex ... **23**.  
 -. Black pattern on upper side pitchy black without metallic reflex. Very similar to *unifasciata australis* (antithesis 23). Length 5.0–6.5 mm (= *tadzgica* MEDVEDEV, 1965). Described from Tadzhikistan ..... *hissarica* LOPATIN, 1963.  
 23. Length of body over 5.5 mm. Elytra finely and shallowly punctate ..... **24**.  
 -. Length of body under 4.0–5.4 mm. Elytra relatively densely and strongly punctate. Remaining characters (except colouration of head) as in *unifasciata* s. str. (thesis 10) ..... *unifasciata australis* MEDVEDEV, 1965.  
 24. Ventral side of aedeagus (figs **244**, **245**) with two ridges. General view as in plate VIII, **phot. 72**. Length 5.5–7.0 mm. Variations: on elytra black stripes particularly narrow (ab. *amasiensis* WEISE, 1889), on elytra black colour very extended, predominant (ab. *inundata* REITTER, 1905, described from central Asia). General view as in plate VIII, **phot. 72**. In Europe distributed in northern Greece, Bulgaria, Crimea and southern Russia ..... *gebleri* GEBLER, 1841.  
 -. Ventral side of aedeagus figs **252**, **253** with one ridge. General view as in plate IX, **phot. 73**. Length 5.5–5.8 mm. Described from Iraq as a subspecies of *unifasciata* (thesis 10) but undoubtedly a distinct species ..... *babylonica* LOPATIN, 1995.

25. Length of body 6.5–8.0 mm. General view as in plate IX, **phot. 74**. Elytral pattern as in fig. **210**. Aedeagus as in figs **248, 249**. Variation: head entirely red (ab. *rubriceps* PIC, 1916). Distributed in Algeria and Tunisia. Here perhaps *C. bleusei* PIC, 1897 described from Algeria and *schrampi* KOCHER, 1958 from Morocco (in both species aedeagus not studied) ..... **kerimii** FAIRMAIRE, 1875.
- . Length of body less than 6.5 mm ..... **26**.
26. Body almost entirely reddish, meso- and metasternum, scutellum and two roundish spots on posterior part of each elytron black. Aedeagus as in figs **250, 251**. Length about 6.0 mm. Described from Tunisia ..... **volatica** NORMAND, 1949.
- . Body not so coloured. Here a few doubtful taxons incertae sedis from northern Africa: *metalliconotata* PIC, 1933, *metalliconotata* ab. *theryi* PIC, 1936, *normandi* PIC, 1914, *sefrensis* PIC, 1897.

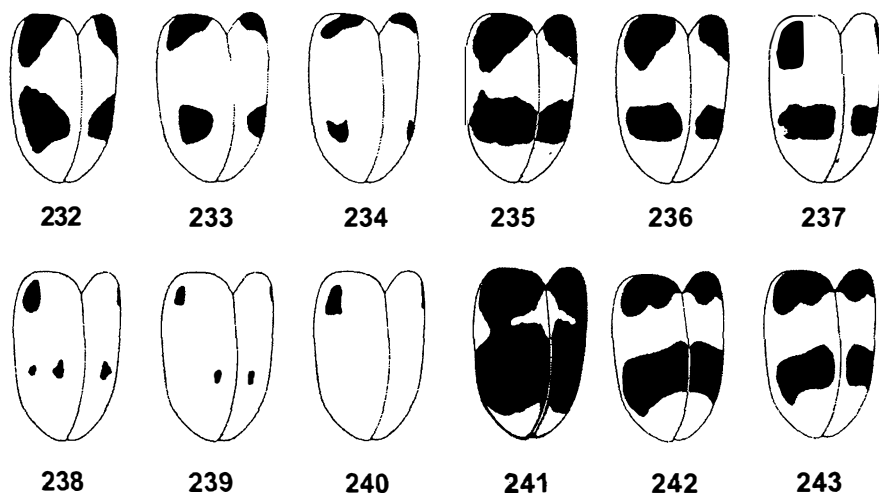


Figs 225-231. Spermatheca (after WARCHALOWSKI 1991): 225 – *Coptocephala crassipes*; 226 – *C. bistri-notata*; 227 – *C. cyanocephala*; 228 – *C. hellenica*; 229 – *C. rubicunda*; 230 – *C. linnaeana*; 231 – *C. scopolina*.

27. N African species. Body on average larger (6.2–8.7 mm) ..... **29**.
- . European or Asiatic species. Body on average smaller (4.0–7.2 mm) ..... **28**.
28. European species ..... **30**.
- . E Asiatic species. Externally similar to *unifasciata* (thesis 10). Aedeagus as in figs **250, 251**. Length 3.8–5.2 mm (= *freija* REITTER, 1900, *asiatica* CHŪJŌ, 1940). Distributed in Mongolia, N China, E Siberia, Korea and Japan ..... **orientalis** BALY, 1873.
29. Frons covered by long (over 0.2 mm), pale golden hairs. Black iuxtascutellar spot situated in some distance from anterior margin (figs **199, 200**). Aedeagus as in fig. **254**, spermatheca as in fig. **226**. General view as in plate IX, **phot. 75**. Length

6.5–8.0 mm (= *sexnotata* FABRICIUS, 1801: 35 nec FABRICIUS, 1801: 31, *trinotata* FORSBERG, 1821). Variation (fig. 200): black spots in anterior part of elytra absent (ab. *espanoli* PIC, 1933). Distributed in western part of Morocco ..... *bistrinotata* (FABRICIUS, 1803).

- Frons covered by shorter (less than 0.15 mm), whitish hairs. Black iuxtascutellar spot situated immediately at anterior margin. General view as in plate IX, **phot. 76**. Aedeagus as in fig. 255. Length 6.5–8.0 mm (= *melanocephala* OLIVIER, 1808, = *sexstigma* PIC, 1918<sup>2</sup>). Variations (figs 217, 218): head with a deep impression on vertex (ab. *impressiceps* PIC, 1918), black spot by scutellum absent (ab. *externepunctata* PIC, 1895 = ab. *theryi* PIC, 1918), elytra without black pattern, entirely red (ab. *tunisea* PIC, 1901 = ab. *?holoxantha* PEYERIMHOFF, 1949)<sup>3</sup>. Distributed in eastern part of Morocco, Algeria and Tunisia ..... *plagiocephala* (FABRICIUS, 1772).



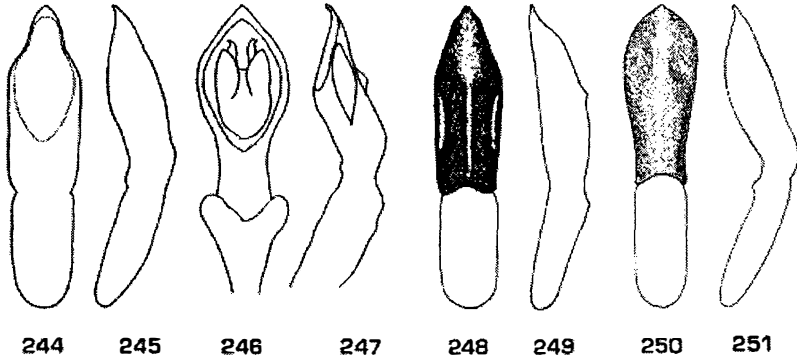
Figs 232-243. Elytral pattern (after WARCHALOWSKI 1991): 232-234: *Coptocephala raffrayi*, variations (unnamed); 235-240 – *C. rubicunda*: 235 – ab. *connexa* CSIKI, 1953; 236 – ab. *vittata* PETRI, 1926; 237 – typical form; 238 – ab. *didymata*; ROUBAL, 1948; 239 – ab. *efasciata* CSIKI, 1953; 240 – ab. *subobliterata* PIC, 1901; 241 – *C. scopolina alticola*; 242, 243 – *C. scopolina* s. str.: 242 – ab. *lateremaculata* DEPOLI, 1926; 243 – typical form.

- 30. Underside of aedeagus usually evenly convex, at most with a indistinct trace of longitudinal swelling. Here different geographical forms of *C. scopolina* sensu lato ..... 31.
- Underside of aedeagus with distinct longitudinal swelling ..... 37.
- 31. Elytra in posterior part with hairs. Elytron reddish, humeral spot and postmedian transverse stripe black (= *bistrimaculata* KÜSTER, 1848). Black pattern usually

<sup>2</sup> *C. sexstigma* var *impressiceps* Pic, 1918 described from Syria belongs probably not here.

<sup>3</sup> Description of ab. *andalusiaca* Pic, 1918, concerns probably *C. scopolina floralis* (thesis 31).

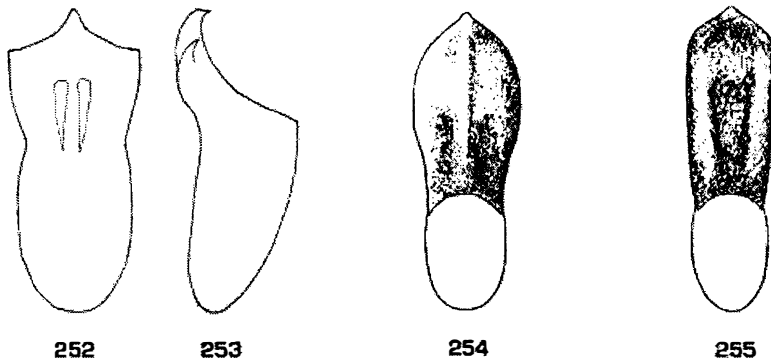
- reduced, sometimes absent (variations and their names see figs 261–265). Other variations: labrum black scutellum partly red (ab. *scutellaris* FUENTE, 1913), labrum red, clypeus black (ab. *peninsularis* BAGUENA, 1960), labrum and clypeus red (ab. *majoricensis* BAGUENA, 1960). Length 4.5–7.0 mm. Distributed in Iberian Peninsula and in the Balearic Islands ..... *scopolina floralis* (OLIVIER, 1791).
- . Elytra entirely hairless ..... 32.
  - 32. Black pattern of elytra like in subsp. *floralis* (figs 261–265), tibiae often partially or entirely red ..... 33.
  - . Black pattern of elytra normal (figs 242, 243) or extended (fig. 241). Legs always black ..... 34.



Figs 244-251. Aedeagus in dorsal, ventral and lateral view (246, 247 after LOPATIN 1995, remaining after WARCHAŁOWSKI 1991): 244, 245 – *Coptocephala gebleri*; 246, 247 – *C. babylonica*; 248, 249 – *C. kerimii*; 250, 251 – *C. orientalis*.

- 33. Small forms (3.8–4.4 mm) from central Spain, with relatively strong punctate elytra ..... *scopolina nana* BAGUENA, 1960.
- . Greater forms 4.5–7.0 mm (in extreme, rare cases almost 8.0 mm). Forms with black legs can simulate the African species *C. plagioccephala* (antithesis 29). Here forms of *C. scopolina floralis* (thesis 31) with hairless elytra.
- 34. Rather small forms (4.8–5.4 mm) from Iberian Peninsula. Elytral punctures a little stronger, also in anterior part ..... 35.
- . On average greater forms (4.8–7.2 mm). Puncturation of elytra finer, on black ground colour of anterior patch often almost absent ..... 36.
- 35. Black pattern normally developed (figs 242, 243). A form from eastern part of Iberian Peninsula ..... *scopolina punctata* WEISE, 1889.
- . Black pattern very extended (fig. 241). A local form from Sierra Nevada ..... *scopolina alticola* COBOS, 1954.
- 36. Smaller (4.8–6.0 mm). Underside of aedeagus (figs 268–270), except lateral impressions, evenly convex, spermatheca as in fig. 231. General view as in plate IX, phot. 77. Variations as in figs 242, 243. Form from Catalonia, southern France,

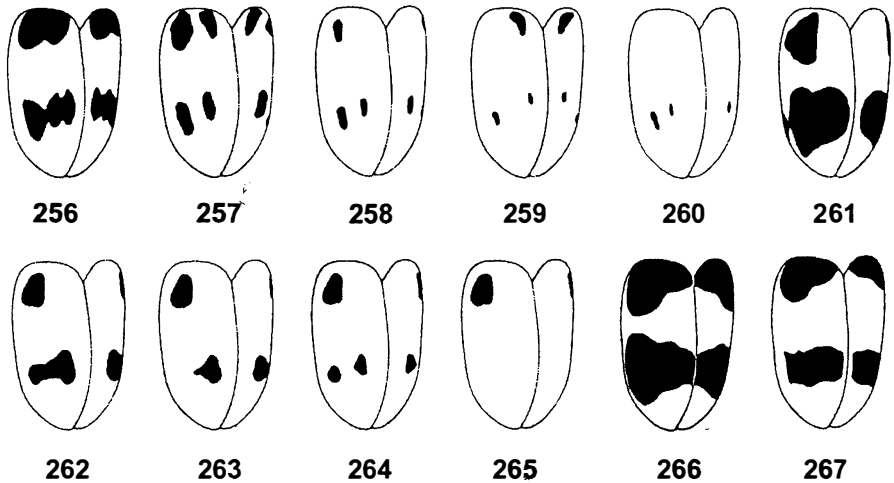
- northern Italy and Croatia. By mistake repeatedly reported from central Europe ....  
 ..... **scopolina** (LINNAEUS, 1767) s. str.
- Larger (5.8–7.2 mm) (= *melanocephala* KÜSTER, 1847 nec OLIVIER, 1808). Underside of aedeagus with a feeble, sometimes hardly perceptible, longitudinal swelling. Form from Sicily, southern Italy and Dalmatia ..... **scopolina kuesteri** KRAATZ, 1872.
37. Longitudinal swelling on underside of aedeagus broad (fig. 222). Remaining characters as in thesis 14. Here forms of *C. fossulata* with black labrum.
- Longitudinal swelling on underside of aedeagus sharp (fig. 459) ..... **38.**



Figs 252-255. Aedeagus in dorsal, ventral and lateral view. (252, 253 orig., remaining after WARCHAŁOWSKI 1991): 252, 253 – *Coptocephala volatica*; 254 – *C. bistrinotata*; 255 – *C. plagioccephala*.

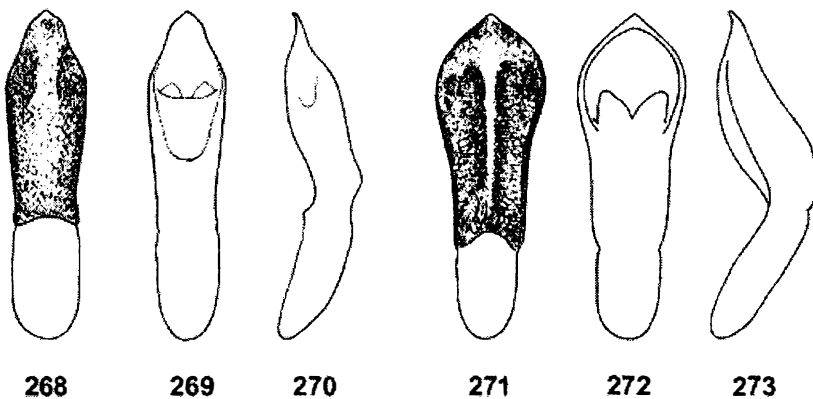
38. On each elytron a transverse black stripe, often strongly reduced or absent, at anterior margin only (figs 205, 206). General view as in plate IX, phot. 78. Aedeagus as in figs 271–273, spermatheca as in fig. 227. Length 4.5–5.5 mm. Sardo-Corsican species, nominotypical subspecies occurs in Sardinia only .....  
 ..... **cianocephala cianocephala** (LACORDAIRE, 1848).
- Each elytron with humeral spot and postmedian transverse stripe. Length 4.5–5.5 mm (= *quinenotata* LEFÈVRE, 1872). Aedeagus as in *cianocephala* (thesis 38) Variations and their names as in figs 232–234. Endemic to Corsica, almost surely conspecific with *cianocephala*, here considered as a subspecies .....  
 ..... **cianocephala raffrayi** (DESBROCHERS, 1870).
39. Pronotum unicolorous, reddish, elytra bluish black with reddish apex or/and lateral margins ..... **40.**
- Pronotum differently coloured (reddish with black spots, entirely black with metallic lustre or black with reddish lateral margins) ..... **41.**
40. W Mediterranean species. Smaller, length of body 3.5 mm. Elytra bluish black with reddish apex. Described from Morocco based on one female only .....  
 ..... **bechynei** COBOS, 1956.
- Species from Afghanistan. Larger, length of body 4.6–5.3 mm. Elytra bluish, in male with pale lateral and apical (in male) or apical margins only (in female). Its membership to the genus *Coptocephala* (unusual colouring of body and unusual

form of aedeagus) is doubtful and still requires an verification. Described from Afghanistan ..... ***kabakovi*** MEDVEDEV, 1978.



Figs 256-267. Elytral pattern (after WARCHAŁOWSKI 1991): 256-260: *Coptocephala scopolina* s. str.: 256 – ab. *separata* DEPOLI, 1926; 257 – ab. *bipunctata* DEPOLI, 1926; 258 – ab. *plagiocephala* auct. nec FABR.; 259 – ab. *scutellaris* DEPOLI, 1926; 260 – ab. *destituta* DEPOLI, 1926; 261-265 – *C. scopolina floralis*: 261-263 – typical form; 264 – ab. *bistriculata* KUESTER, 1848; 265 – ab. *humeralis* FUENTE, 1918; 266, 267 – *C. unifasciata*: 266 – ab. *conjuncta* CSIKI, 1953; 267 – typical form.

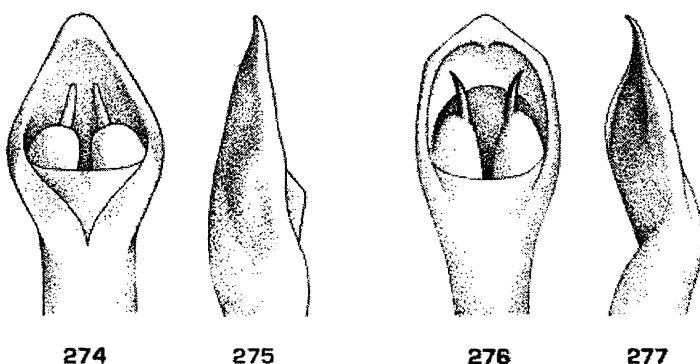
- 41. Upper side entirely black or black with metallic lustre ..... 42.
- . Upper side not entirely black ..... 43.



Figs 268-273. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1991): 268-270 – *Coptocephala scopolina*; 271-273 – *C. cyanocephala*.



42. In male clypeus distinctly emarginate, its lateral angles protruding. General view as in plate IX, **phot. 79**. Aedeagus as in figs **274, 275**. Length 3.2–5.0 mm (= *proxima* ESCALERA, 1914). Variation: upper side without metallic lustre, black (ab. *atra* PIC, 1932), upper side with metallic aeneous reflex (ab. *aenescens* PIC, 1932). Distributed in western part of Mediterranean area, from Morocco and Iberian Peninsula to Sicilia ..... **unicolor** (LUCAS, 1845).
- . In male clypeus very shallowly emarginate, its lateral angles not protruding. Aedeagus as in figs **276–278**. Distributed in European part of Mediterranean area, basin of Danube, Bulgaria, Crimea and southern Russia to Transcaspia. Length 3.0–4.0 mm ..... **chalybaea** s. str.
43. Pronotum reddish with black spots, elytra greenish or bluish black with pale borders and pale apex ..... **44**.
- . Pronotum with broad flavous lateral borders ..... **45**.



Figs 274-277. Aedeagus in dorsal and lateral view (after PETITPIERRE 2000): 274, 275 – *Coptocephala unicolor*; 276-277 – *C. chalybaea*.

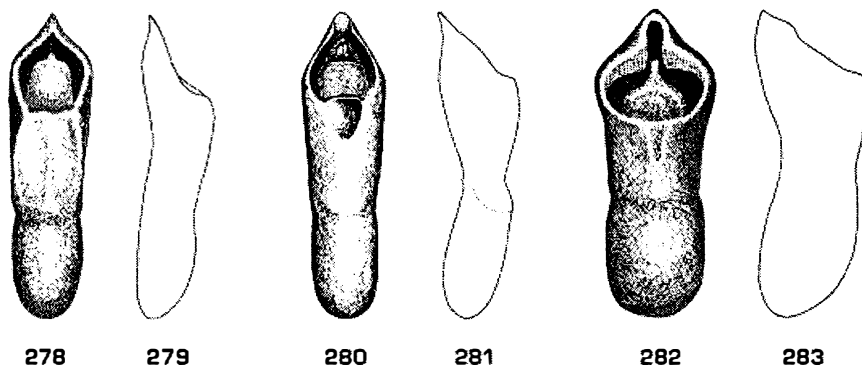
44. Pronotum reddish with two black dots. Elytra greenish black with pale borders and pale apex. Aedeagus not studied. Length. 3.5 mm. Described from Algeria based on one specimen only. Often considered as a colour variation of *C. peresi* (antithesis 45) ..... **flavolimbata** PIC, 1905.
- . Pronotum reddish with four black spots forming a transverse row. Elytra greenish black with pale borders and pale apex. Length 3.5 mm. Described from Tunisia based on one specimen only. *C. peresi* ab. *maculicollis* PIC, 1919 (antithesis 45).
45. Elytra with pale apical spots only. Distributed in Crimea, Caucasian countries and Central Asia ..... **chalybaea apicalis** (LACORDAIRE, 1848).
- . Elytra with pale apical spots and pale lateral margins. Aedeagus not studied. Length 3.5 mm. Variation: pronotum reddish with transverse row of four metallic spots (ab. *maculicollis* PIC, 1919). Described from Tunisia ..... **peresi** (VAULOGER, 1895).

Genus *Labidostomis* GERMAR, 1822

Literature: WARCHAŁOWSKI 1985.

Key to subgenera

1. Punctures of pronotum very fine. Each elytron with a little spot on humerus and a short transverse stripe in posterior part; in consequence the insect reminds a little *Clytra* ..... ***Wellschmiedia*** (p. 107).
- . Punctures of pronotum distinct. Elytra never coloured as above ..... **2.**



Figs 278-283. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1986): 278, 279 – *Labidostomis (Wellschmiedia) ghilianii*; 280, 281 – *L. (Labidostomis) testaceipes*; 282, 283 – *L. (L.) pallidipennis*.

2. In male antennomeron 1 distinctly shorter than 2–4 together. Length of body usually above 6.0 mm ..... ***Labidostomis*** s. str. (p. 74).
- . In male antennomeron 1 about as long as 2–4 together. Length of body usually under 6.0 mm ..... ***Chlorostola*** (p. 72).

Subgenus *Chlorostola* WEISE, 1881

Key to species (males only)

1. Pronotum particularly strong and sparsely punctate. Colouring of elytra very variable, names of aberrations see figs 487–493. General view as in plate X, **phot. 82**. Length 4.2–5.9 mm. Distributed in Sardinia and Corsica. The form *syriaca* LACORDAIRE, 1848, occurring in Corsica is sometimes discussed as a distinct species ...  
..... ***centromaculata*** GÉNÉ, 1839.
- . Pronotum not very strong and sparsely punctate ..... **2.**
2. Elytra unicolorous, black with metallic lustre ..... **3.**
- . Elytra bicolorous ..... **4.**
3. First antennomeron as long or longer than three following segments. Tooth in the middle of anterior margin of clypeus long, rounded at apex. One aberration was

- described: metallic lustre of upper side purplish-violaceous (ab. *atropurpurea* BAGUENA, 1960). General view as in plate X, **phot. 85**. Aedeagus as in figs **494, 495**. Length 4.3–5.7 mm. Distributed in Spain, Portugal and Morocco ..... *hordei* (FABRICIUS, 1787).
- First antennomeron shorter than three following segments. Tooth in the middle of anterior margin of clypeus short, broad. Unicolorous form of *guerini* (ab. *trifoveolata* DESBROCHERS, 1866, see antithesis 9).
4. Elytra covered with erect, uniform, here and there more condensed hairs. Elytra black with bluish metallic lustre, theirs margins red. Length 4.8 mm. Distributed in Morocco ..... *rufomarginata* (VAULOGER, 1895).
- Elytra nude, sometimes with wery short, hardly perceptible hairs in posterior part ..... **5**.
5. Mid part of lateral margin of elytron reddish ..... **6**.
- Mid part of lateral margin of elytron black. Elytron blackish with metallic lustre, at least with a reddish apical patch ..... **7**.
6. Exterior margin of mandibula forms a projecting, rounded angle. Elytra black with greenish-bluish metallic lustre, theirs margins reddidh. Aedeagus as in figs **498, 499**. General view as in plate X, **phot. 86**. Length about 5.1 mm. Occurs in Andalusia ... ..... *nevadensis* DANIEL et DANIEL, 1904.
- Exterior margin of mandibula without a projecting angle. Mandibulae relatively short. Elytra black with bluish metallic lustre, theirs margins reddish. General view as in plate V, **phot. 41**. Aedeagus as in figs **500, 501**. Length about 3.5 mm. Known from the Middle Atlas Mts only ..... *embergeri* THÉRY, 1929.
7. Apical margin of elytron black ..... **8**.
- Apical margin of elytron reddish ..... **9**.
8. Species from ibero-mauritanian area. Aedeagus as in figs **502, 503**. Length 4.4–5.1 mm. Elytron black with metallic lustre and with two (humeral and apical) reddish patches. General view as in plate IX, **phot. 81**. Forms two subspecies: anterior patch great, rounded (subsp. *garciaolmoi* COBOS, 1954), anterior patch transverse, narrow, sometimes reduced to reddish anterior margin (subsp. *bolivari* s. str.). Distributed in southern Spain (subsp. *garciaolmoi*) and in Morocco (subsp. *bolivari* s. str.) ..... *bolivari* ANTOINE, 1936.
- Species from Libya. General view as in plate IX, **phot. 80**. Length 4.0 mm. Remaining characters as in *L. bolivari* s. str. .... *andreinii* ESCALERA, 1931.
9. Elytron black with metallic lustre, its anterior and lateral margin reddish. Length 5.0 mm. Genitalia not described. Occurs in High Atlas ..... *ballsi* ANTOINE, 1936.
- Elytron black with metallic lustre and with one (apical) or two (humeral and apical) reddish patches. General view as in plate X, **phot. 84**. Aedeagus as in figs **504, 505**. Length 5.0–6.7 mm. Four forms were described: elytra unicolorous, black with metallic lustre (*guerini* s. str., ab. *trifoveolata* DESBROCHERS, 1866), each elytron with one patch (subsp. *guerini* s. str.), as *guerini*, but metallic reflex on upper side violaceous (*guerini lejeunei* ab. *violaceipennis* PIC, 1932), each elytron with two patches (subsp. *lejeunei* FAIRMAIRE, 1866). Distributed in north-eastern Algeria, Tunisia, Sicily and southern Italy (subsp. *guerini* s. str.) alike in northern Algeria in the mountains Ouarsenis and Djurdjura (subsp. *lejeunei*) ..... *guerini* (BASSI, 1834).

Subgenus *Labidostomis* s. str.

Separate keys to species: males, p. 74, females, p. 96.

A. Key to auxiliary groups (males only)

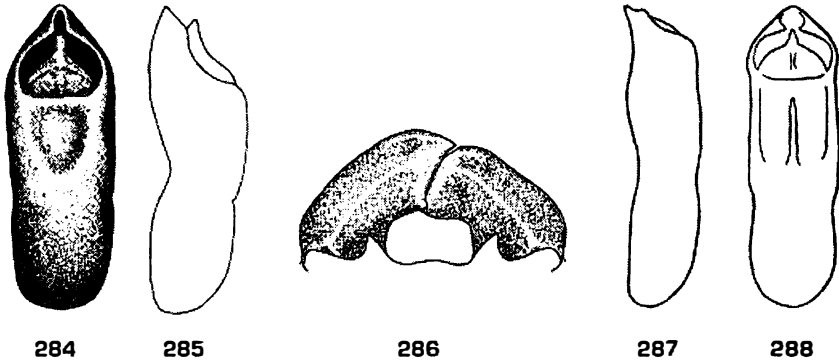
1. Labrum yellowish or reddish, at most with a little darker spot in the middle ..... **2**.
- Labrum at least in the middle with a great, dark spot, usually entirely pitchy or blackish, often with anterior margin reddish ..... **5**.
2. Elytra unicolorous (yellowish or reddish, in *sibirica* bluish black) or pale with dark humeral spot ..... **3**.
- Elytra with or without a humeral dot, always with a dark spot on disc. Caucasian and Asiatic species only ..... auxiliary **group D** (p. 80).
3. Hairs on pronotum adhering, in hind part forming more densely pubescent areas. Aedeagus shortly sharpened, its underside without deep, roundish impressions ..... auxiliary **group A** (p. 74).
- Hairs on pronotum semierect, erect or absent, in hind part no more densely pubescent areas ..... **4**.
4. Pronotum bare ..... auxiliary **group B** (p. 77).
- Pronotum covered by hairs ..... auxiliary **group C** (p. 79).
5. Antennomeres 1–3 normal, 4–11 expanded. W Mediterranean species ..... auxiliary **group L** (p. 94).
- Antennomeres 1–4 normal, 5–11 expanded ..... **6**.
6. Apical margins of aedeagus on dorsal side without teeth (figs **290, 297, 299**) ... **7**.
- Margins of apex of aedeagus on dorsal side with two small teeth (figs **284, 288**) ..... auxiliary **group K** (p. 91).
7. Mandibulae short and broad, their inner side almost horizontal (fig. **343**). One centralasiatic species only ..... auxiliary **group E** (p. 83).
- Inner side of mandibulae slopping or almost vertical ..... **8**.
8. Mandibulae small and short, not very larger than in female ..... auxiliary **group F** (p. 83).
- Mandibulae fairly enlarged ..... **9**.
9. Aedeagus conspicuously formed, its apex broad, almost transversely cut, with a finger-like process (fig. **392**). One E Mediterranean species only ..... auxiliary **group J** (p. 90).
- Aedeagus formed normally ..... **10**.
10. Pronotum bare ..... auxiliary **group G** (p. 84).
- Pronotum covered by hairs ..... **11**.
11. Hairs on pronotum adhering, in hind part forming more densely pubescent areas ... auxiliary **group I** (p. 89).
- Hairs on pronotum semierect, erect or absent, in hind part no more densely pubescent areas ..... auxiliary **group H** (p. 86).

Auxiliary group A

Labrum yellow. Elytra uniformly pale or with dark humeral spot only. Hairs on pronotum adpressed.

Key to species

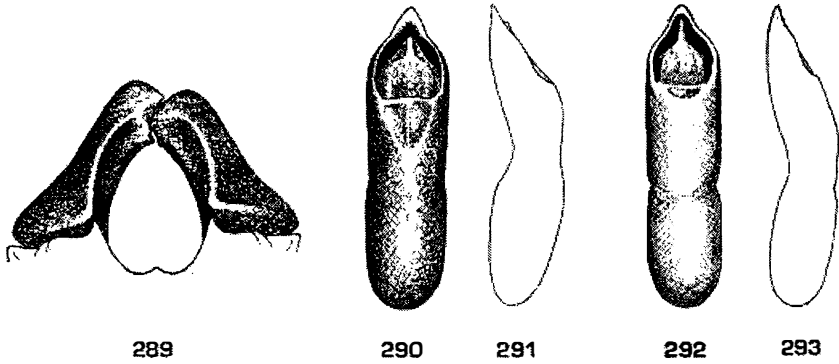
1. At least all legs testaceous, but usually the whole upper side pale coloured. In male mandibulae as in fig. **286**. Aedeagus as in figs **280**, **281**. General view as in plate XI, **phot. 98**. Length 6.9–7.3 mm (= *delagrangei* PIC, 1904, *robusta* REINECK, 1911). Distributed in eastern Turkey, Armenia and W Syria ..... ***testaceipes*** PIC, 1904.
  - . Legs, head, pronotum and underside black with distinct bluish or greenish metallic reflex ..... **2**.
2. Outer edge of mandible blunt ..... **3**.
- . Outer edge of mandible sharp, it forms an elevated border ..... **5**.



Figs 284–288 (after WARCHAŁOWSKI 1986): 286 – mandibulae, remaining – aedeagus in dorsal and lateral view: 284, 285 – *Labidostomis (Labidostomis) cyanicornis*; 286 – *L. (L.) testaceipes*; 287, 288 – *L. (L.) harazensis*.

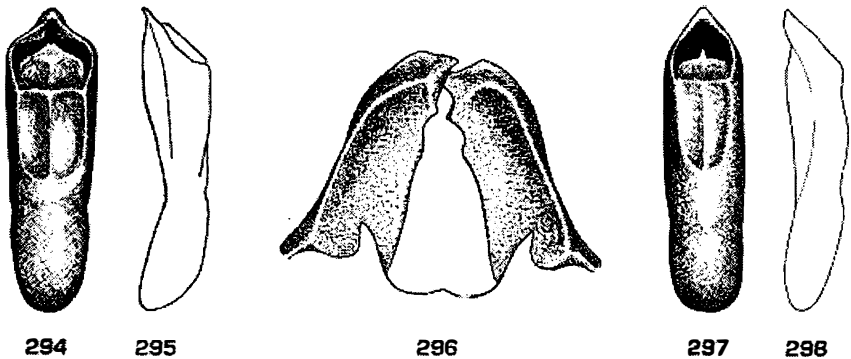
3. Pronotum finely punctate. Hairs on pronotum long, ground colour of elytra very finely reticulate. General view as in plate XI, **phot. 94**. Aedeagus as in figs **282**, **283**. Length 8.2–10.7 mm (= *chalybaeicornis* BRULLÉ 1832, *longipennis* GEBLER, 1841, *distinguenda* ROSENHAUER, 1847, *pilicollis* LACORDAIRE, 1848, *elongata* LACORDAIRE, 1848, *sicula* KRAATZ, 1872). Forms two subspecies: larger (over 8.0 mm), mandibles in male not entirely blunt, apical borders of aedeagus weakly thickened (nominotypical subspecies); smaller (under 8.0 mm), mandibles in male entirely blunt, apical borders of aedeagus distinctly thickened (subsp. *chinensis* LEFÈVRE, 1887). Distributed from northern Spain, Italy and basin of Danube to Altai mts. (nominotypical subspecies) and from Mongolia to Korea (subsp. *chinensis*) ..... ***pallidipennis*** (GEBLER, 1830).
  - . Pronotum strongly punctate ..... **4**.
4. Elytra uniformly pale. Hairs on pronotum rather short, in the middle of disk sometimes almost entirely reduced. Aedeagus as in figs **284**, **285**. Length 6.6–8.5 mm (= *fulvipennis* LACORDAIRE, 1848, *dimidiaticornis* LACORDAIRE, 1848, *hungarica* LACORDAIRE, 1848, *salicis* LACORDAIRE, 1848). Distributed in southern part of M Europe, Romania, Ukraine and in basin of Volga ..... ***cyanicornis*** GERMAR 1822.

- Elytra with dark humeral spot. Metallic shine on head and pronotum green. Elytra finely punctate, matt. In male mandibles very characteristic (fig. 289). Length 7.6–8.0 mm. Described from N Iran ..... **harazensis** RAPILLY, 1984.
- 5. In anterior part of pronotum run a transverse, bent furrow ..... 6.
- Pronotum at most with a shallow impression, without furrow in anterior part .... 7.



Figs 289-293 (after WARCHAŁOWSKI 1986): 289 – mandibulae, remaining – aedeagus in dorsal and lateral view: 289 – *Labidostomis (Labidostomis) harazensis*; 290, 291 – *L. (L.) sulcicollis*; 292, 293 – *L. (L.) kaszabi*.

- 6. The mentioned furrow deep and sharp. Aedeagus as in figs 290, 291. Length 5.8–7.1 mm. Distributed in Asia Minor ..... **sulcicollis** (LACORDAIRE, 1848).
- The mentioned furrow shallower. Aedeagus as in figs 292, 293. Length 5.9–6.2 (female) to 6.7–7.8 (male). Distributed in Caucasian countries ..... **kaszabi** MEDVEDEV, 1962.



Figs 294-298 (after WARCHAŁOWSKI 1986): 296 – mandibulae, remaining – aedeagus in dorsal and lateral view: 294-296 – *Labidostomis (Labidostomis) arcuata*; 297, 298 – *L. (L.) decipiens*.

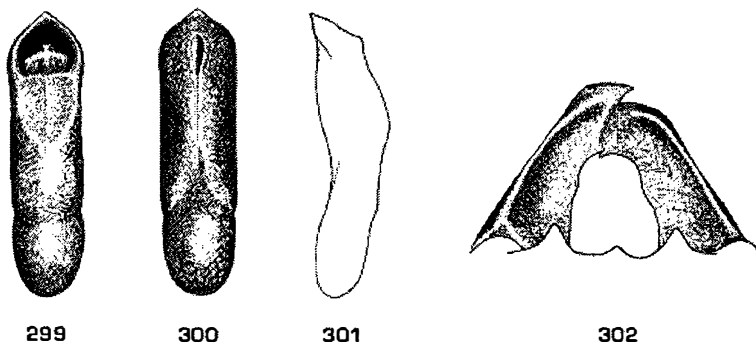
7. Aedeagus in apical part of underside with a deep, longitudinal, median, often fissure-like furrow. Humeral spot in female present, in male often absent or strongly reduced ..... **8**.
- Aedeagus (figs **294–296**) on underside without median furrow. Elytra with humeral spot. In male mandibles very long, straight (fig. **296**). Punctuation of pronotum fine, hairs long, reaching almost 200  $\mu\text{m}$ . Elytra about 2 $\times$  stronger punctate than pronotum, weakly shining. Length 8.7–11.5 mm. Distributed in Tien Shan mts. .... ***arcuata*** PIC, 1920.
8. In male mandibles curved. In female in hind part of each elytron sometimes a longitudinal, narrow stripe, brown or brown weakly bluish metallic shining. Aedeagus as in figs **297, 298**. Length 8.4–9.6 mm (= *lineola* REDTENBACHER, 1843). Distributed in Cyprus, Asia Minor, Caucasian countries, Syria, northern Iran .... ***decipiens*** FALDERMANN, 1837.
- In male mandibles straight (fig. **302**). In female a darker stripe on elytra never present. Aedeagus (figs **299–301**) on the underside in apical part with a deep, short, longitudinal groove. Length 9.6–10.6 mm (= *speculifrons* KRAATZ, 1872, *attenuata* PIC, 1897). Distributed in Israel, Lebanon, S Turkey (Hatay) and northern Syria ..... ***diversifrons*** LEFÈVRE, 1872.

#### Auxiliary group **B**

Labrum yellow, pronotum bare.

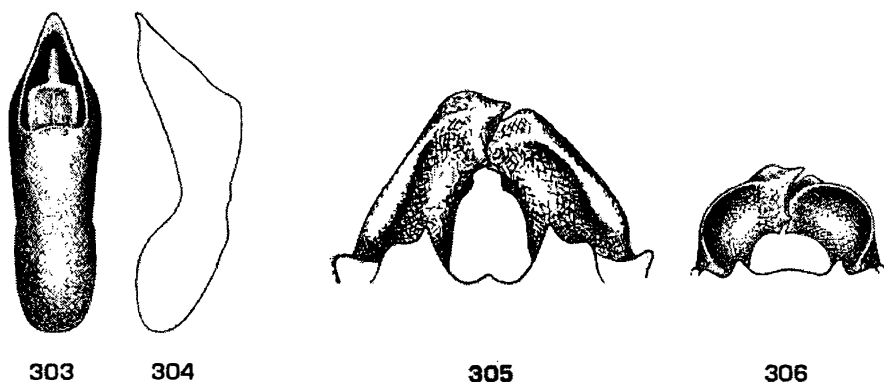
#### Key to species

1. Elytra uniformly blue black, at most in hind part reddish shining trough. Body blue black, labrum and antennomeres 2–4 yellowish red. Length 5.8–8.4 mm. In N China forms a smaller form with finer punctate pronotum (ab. *altaica* GEBLER, 1848). Distributed in Altai, Mongolia, E Siberia and N China .... ***sibirica*** (GERMAR, 1824).
- Elytra uniformly pale or pale with blackish humeral spot ..... **2**.



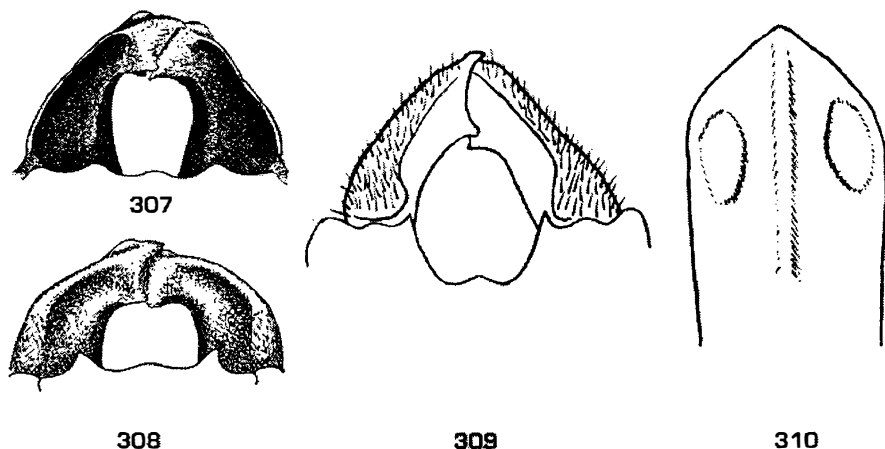
Figs 299–302 (after WARCHAŁOWSKI 1986): *Labidostomis (Labidostomis) diversifrons*: 299–301 – aedeagus in dorsal, ventral and lateral view; 302 – mandibulae.

2. Fore edges of clypeus strongly protruding (fig. 305). Elytra uniformly pale. Outer margins of mandibulae elevated. Aedeagus as in figs 303, 304. Length 6.3–7.6 mm. Distributed in Baltic countries, W Russia, Byelorussia, Ukraine, known also from Slovakia ..... *lepida* LEFÈVRE, 1872.
- . Fore edges of clypeus normal. E Asiatic species ..... 3.



Figs 303-306 (after WARCHALOWSKI 1986): 303, 304 – aedeagus in dorsal and lateral view, 305, 306 – mandibulae: 303-305 – *Labidostomis (Labidostomis) lepida*; 306 – *L. (L.) tjutschewi*.

3. Mandibulae bowl-like, their outer margins rounded (fig. 306). Elytra yellowish with blackish humeral spot. Length 6.2–7.3 mm (female) to 6.9–7.8 mm (male). Distributed in Sajjan mts. and W Mongolia ..... *tjutschewi* JACOBSON, 1902.
- . Mandibulae not bowl-like ..... 4.



Figs 307-310 (307, 308 after WARCHALOWSKI 1986; 309, 310 after MEDVEDEV 1983): 307-309 mandibulae, 310 – apical part of aedeagus in ventral view: 307 – *Labidostomis (Labidostomis) amurensis*; 308 – *L. (L.) transistoria*; 309, 310 – *L. (L.) martensi*.



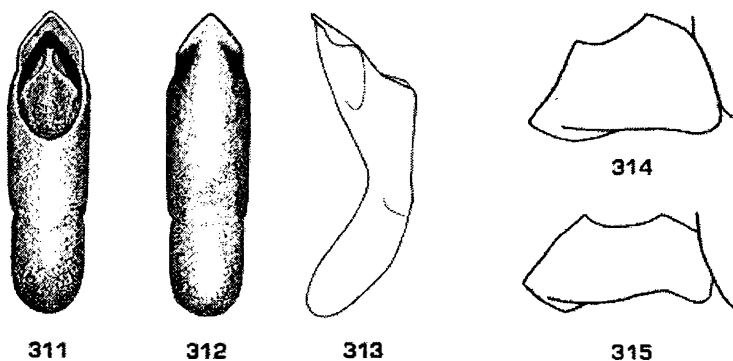
4. Outer edge of mandibulae razor-sharp. Humeral spot weak, sometimes almost disappearing. Puncturation of pronotum not uniform, consisting of mixed finer and stronger punctures. Aedeagus as in fig. 307. Length 6.8 mm (female) to 7.4–8.4 mm (male) (= *orientalis* CHŪJŌ, 1940). Distributed in basin of Amur and in Korea, from Mongolia is described subspecies *nigrilabris* MEDVEDEV, 1980 with dark labrum (see auxiliary group G, antithesis 4) ..... ***amurensis*** HEYDEN, 1884.
- . Outer edge of mandibulae blunt. Humeral spot always present and distinct. Aedeagus as in fig. 308. Length 6.1–7.6 mm (female) to 7.0–8.4 mm (male). Variation: ground of elytra very pale, humeral spot lighter (ab. *fallacissima* JACOBSON, 1901). Distributed from Altai to Transbaicalia ..... ***transitoria*** JACOBSON, 1901.

### Auxiliary group C

Labrum yellow, pronotum covered by erect or semierect hairs, elytra pale with dark humeral spot.

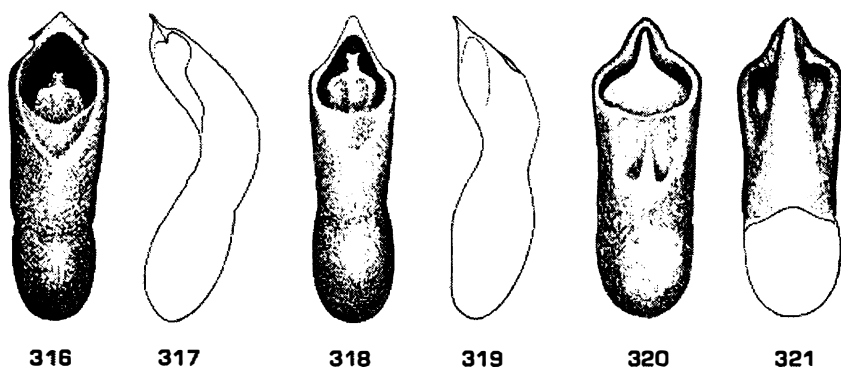
#### Key to species

1. Hairs on pronotum very long, erect, often shaggy ..... **2.**
- . Hairs on pronotum short, never shaggy ..... **3.**
2. Impressions on underside of aedeagus (fig. 310) shallow, never encroaching on lateral borders. In male top margin of mandible (fig. 309) in lateral view not emarginate. Poorly studied species, female not described. Occurs in N Iran (Elburz Mts.) ..... ***martensi*** MEDVEDEV, 1983.
- . Impressions on underside of aedeagus deep, encroaching on lateral borders, in consequence apex of aedeagus in ventral view arrow-like (figs 311–313). In male top margin of mandible in lateral view emarginate (figs 314, 315). In old material hairs on pronotum mostly shaggy, tuft-like colled together. Ground of pronotum shining, uniformly, distinctly punctate. Length 6.8–7.5 mm (female) to 7.1–9.2 mm (male) (= *heteromalla* LEFÈVRE, 1889, *villosula* WEISE, 1900). Distributed in Bulgaria, Greece and north-western Turkey ..... ***oertzeni*** WEISE, 1889.



Figs 311-315 (after WARCHALOWSKI 1986). *Labidostomis (Labidostomis) oertzeni*: 311-313 – aedeagus in dorsal, ventral and lateral view; 314, 315 – left mandible in lateral view.

3. Apex of aedeagus (figs **316**, **317**) short, in ventral view arrow-like. Elytra straw yellowish, humeral spot present. Hairs on pronotum in male shorter (60–70  $\mu\text{m}$ ), in female longer (about 100  $\mu\text{m}$ ). Length 6.7–7.2 mm (female) to 6.9–8.6 mm (male) (= *escherichi* WEISE, 1897, *iconiensis* WEISE, 1900, *frontalis* WEISE, 1900). Distributed in Asia Minor ..... ***mesopotamica*** HEYDEN, 1886.
- . Apex of aedeagus (figs **318**, **319**) elongate, in ventral view not arrow-like, lateral impressions on ventral side encroach not very deeply upon the lateral margin. Hairs on pronotum short and sparse. On pronotum punctures moderately strong, on elytra stronger. Ground of elytra rather indistinctly reticulate. Length 8.0–10.2 mm. Two geographical forms were described: impressions on the underside of aedeagus stronger, labrum always pale (subsp. *peregrina* s. str.), impressions on the underside of aedeagus shallower, labrum partly darkened (subsp. *pachysoma* MEDVEDEV, 1965). Distributed in Crimea and eastern Ukraine (*pachysoma*), Caspian area, Caucasian countries and Asia Minor (*peregrina* s. str.) ..... ***peregrina*** WEISE, 1900.



Figs 316–321. Aedeagus in dorsal, lateral and ventral view (after WARCHAŁOWSKI 1986): 316, 317 – *Labidostomis* (*Labidostomis*) *mesopotamica*; 318, 319 – *L. (L.) peregrina*; 320, 321 – *L. (L.) kantneri*.

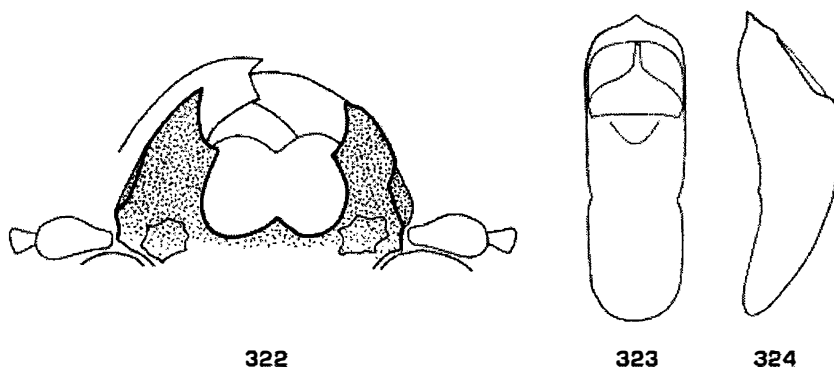
#### Auxiliary group D

Labrum yellow, elytra with or without a humeral dot, always with a dark spot on disc.

#### Key to species

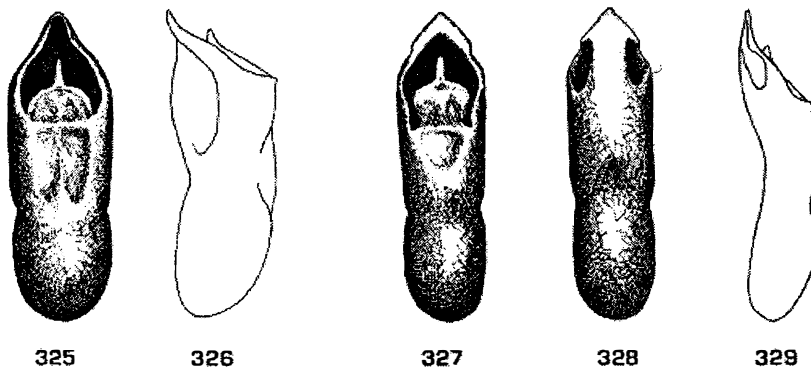
1. In male lateral teeth on clypeus conspicuously long, protruding anteriorly (fig. **322**). General view as in plate X, **phot. 87**. Labrum and antennomeres 1–4 reddish yellow or dark yellow. Elytron reddish yellow with a small blackish humeral dot and a great, central bluish-black spot reaching suture but distant from scutellum and from lateral margin. Remaining parts of body bluish-black. Aedeagus as in figs **320**, **321**. Length 4.5–6.1 mm (female) to 5.3–6.1 mm (male). Described from Iran ..... ***kantneri*** WARCHAŁOWSKI, 2004.
- . In male lateral teeth on clypeus normal ..... **2**.

2. Discal spot very large, elytra bluish-black, anteriorly, laterally and apically yellowish margined. Humeral spot present, but usually fused with discal spot. General view as in plate X, **phot. 90**. Aedeagus as in figs **323, 324**. Length 6.0–8.0 mm (= *heinzi* LOPATIN, 1993). Length 6.0–8.0 mm. Occurs in Israel ..... *laeta* MEDVEDEV, 1992.
- . Discal spot smaller, ground colour of elytra yellowish or reddish ..... **3**.
3. External margin of mandibula high elevated ..... **4**.
- . External margin of mandibula not elevated ..... **6**.



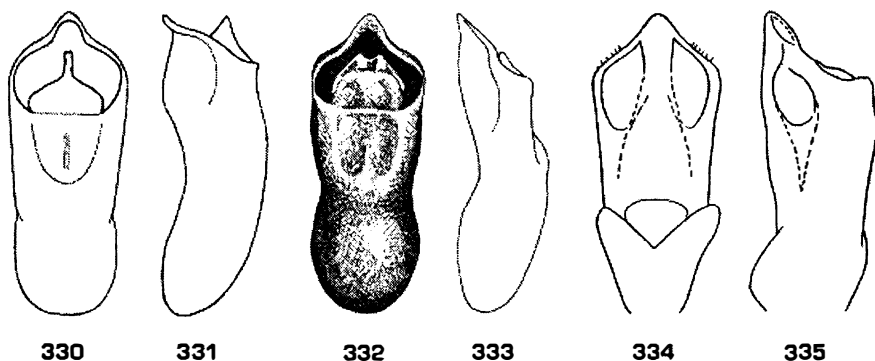
Figs 322-324 (322 after WARCHAŁOWSKI 2004; 323, 324 after MEDVEDEV 1992): 322 – *Labidostomis (Labidostomis) kantneri*, mandibulae; 323, 324 – *L. (L.) laeta*, aedeagus in dorsal and lateral view.

4. Length of body more than 9.5 mm. Aedeagus as in figs **325, 326** (= *trigemina* WEISE, 1898). Distributed in Asia Minor, Caucasian countries, northern Iran and Central Asia ..... *subfasciata* WEISE, 1885.
- . Length of body at most 8.5 mm ..... **5**.



Figs 325-329. Aedeagus in dorsal, lateral and ventral view (after WARCHAŁOWSKI 1986): 325, 326 – *Labidostomis (Labidostomis) subfasciata*; 327-329 – *L. (L.) korbi*.

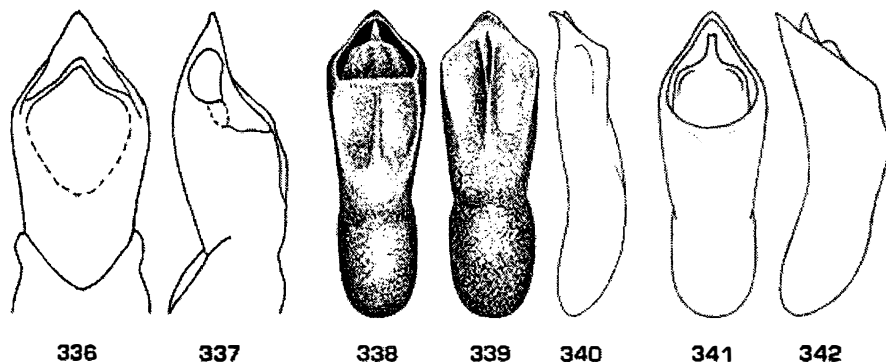
5. On each elytron two (humeral and central) spots blackish, moreover sometimes a blurred, longitudinal, brownish spot at lateral margin. Puncturation of probotum fine (~ 25 µm), only at anterior margin stronger (sometimes over 50 µm). Puncturation of elytra moderately strong (~ 60–80 µm). Aedeagus (figs 327–329) rather slender, underside before apex on both sides with an elongate hollow. Length of male 6.8–7.1 mm (female) to about 8.1 mm (male). Described from Akşehir (prov. Konya, Turkey), known from locus typicus only ..... **korbi** WEISE, 1901.
- . On each elytron a humeral spot and in the midlength a transverse band black, sometimes divided into two spots. Aedeagus (figs 330, 331) broad, dorsally at apex without small folds. Length 6.2–7.4 mm. Forms three subspecies: on each elytron two central spots (subsp. *afghanica* MEDVEDEV, 1978 from prov. Kabul), central spots on elytra fused into a very broad transverse stripe, metallic reflex on black parts of body weak or absent (nominotypical subspecies from prov. Nuristan), central spots fused into a moderately broad transverse stripe, metallic reflex on black parts of body distinct or even strong, greenish (subsp. *bamiana* MEDVEDEV, 1978, described from Kuh-e-Baba mts. in prov. Bamian, differs also by shape of aedeagus). Known from Afghanistan only ..... **nuristanica** REINECK, 1937.



Figs 330-335. Aedeagus in dorsal, lateral and ventral view (334, 335 after LOPATIN 1979; remaining after WARCHAŁOWSKI 1986): 330, 331 – *Labidostomis (Labidostomis) nuristanica*; 332, 333 – *L. (L.) maculipennis*; 334, 335 – *L. (L.) luristanica*.

6. Body length over 8.2 mm. Aedeagus (figs 332, 333) very broad. On each elytron apart from humeral spot a roundish black spot immediately before midlength. Puncturation of elytra strong (to about 80 µm). General view as in plate XI, phot. 93. Length 8.2–9.2 (female) to 8.4–9.4 mm (male) (= *kindermannii* KRAATZ, 1872). Distributed in Turkey, Armenia and basin of Low Volga ..... **maculipennis** LEFÈVRE, 1870.
- . Body length always under 7.6 mm ..... 7.
7. On each elytron a great dark spot, brownish or blackish with blue metallic reflex, reaching almost scutellum. Humeral spot present in female only. Elytra strongly punctate. Aedeagus as in figs 334, 335. Length 5.7–6.2 mm (= *inhumeralis* PIC, 1920, *shirazica* LOPATIN, 1979). Distributed in Iran ..... **luristanica** PIC, 1920.
- . On each elytron a great dark spot, brownish or blackish with blue metallic reflex, reaching almost scutellum ..... 8.

8. Upper side of mandible slightly concave. Aedeagus as in figs **336**, **337**. Remaining characters as in *elegans* (antithesis 8). Length 6.4 mm. Probably a local form of *elegans*. Described based on one specimen only from mt. Damavend in N Iran ....  
 ..... **damavandensis** RAPILLY, 1984.
- On each elytron, except the humeral spot, a great black patch with bluish metallic lustre. The both patches sometimes joined together. General view as in plate X, **phot. 88**. Aedeagus as in figs **338-340**. Length 6.3-7.6 mm (= *reitteri* WEISE, 1885). Distributed in Caucasian countries and in northern Iran .....  
 ..... **elegans** LEFÈVRE, 1876.



Figs 336-342. Aedeagus in dorsal, lateral and ventral view (336, 337 after RAPILLY 1984, remaining after WARCHALOWSKI 1986): 336, 337 - *Labidostomis (Labidostomis) damavandensis*; 338-340 - *L. (L.) elegans*; 341, 342 - *L. (L.) schneideri*.

#### Auxiliary group E

Labrum dark, mandibulae very short and broad, their inner sides almost horizontal.

One species only. Mandibulae as in fig. **343**. Hairs on pronotum very short and sparse, perceptible in basal part only. Whole upper side covered by reticulation, elytra very shallowly punctate, their sheen weak, fatty. Aedeagus as in figs **341**, **342**. Length 7.1-8.1 mm (female) to 7.4-9.0 mm (male) (= *polygoni* LOPATIN, 1961). Distributed in Tadshikistan and SO Uzbekistan ..... **schneideri** WEISE, 1900.

#### Auxiliary group F

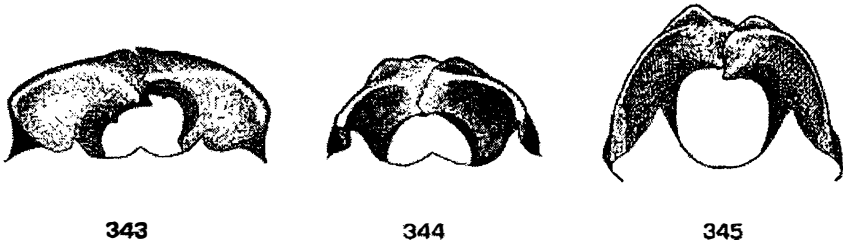
Labrum dark, mandibulae in male very small, hardly greater than in female.

#### Key to species

1. Elytra uniformly pale. Pronotum bare, rather deeply, densely and strongly punctate. Elytra indistinctly reticulated, shining. Length 6.4-9.1 mm (= *viridicollis* LACORDAIRE,

1848, *kluczyckii* NOWICKI, 1872, *leithneri* REDTENBACHER, 1874). Distributed in a great part of Palaearctic, from central France, England and Sweden to Mongolia ....

- ..... *tridentata* (LINNAEUS, 1758).  
 -. Elytra with small humeral spot. Pronotum covered by short, erect hairs, reticulate, rather densely and irregularly punctate. Length 8.5 mm. Described from Tadshikistan (NE Pamir Mts.) ..... *lipskyi* LOPATIN, 1961.



Figs 343-345. Mandibulae (after WARCHALOWSKI 1986): 343 - *Labidostomis (Labidostomis) schneideri*; 344 - *L. (L.) tridentata*; 345 - *L. (L.) brevipennis*.

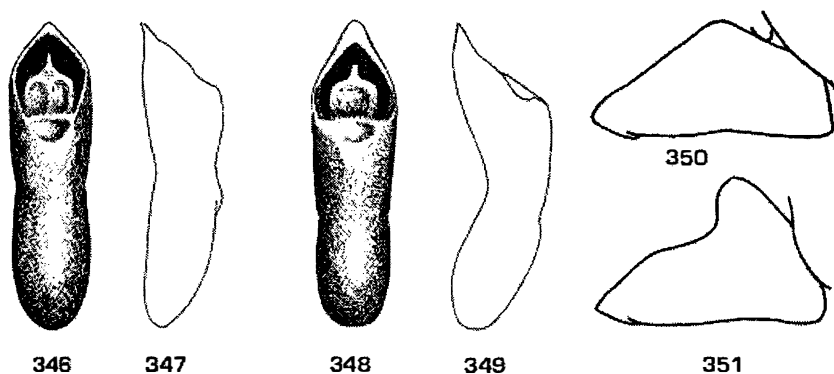
#### Auxiliary group G

Labrum dark, pronotum bare or almost bare, apical margins of aedeagus on dorsal side without teeth.

#### Key to species

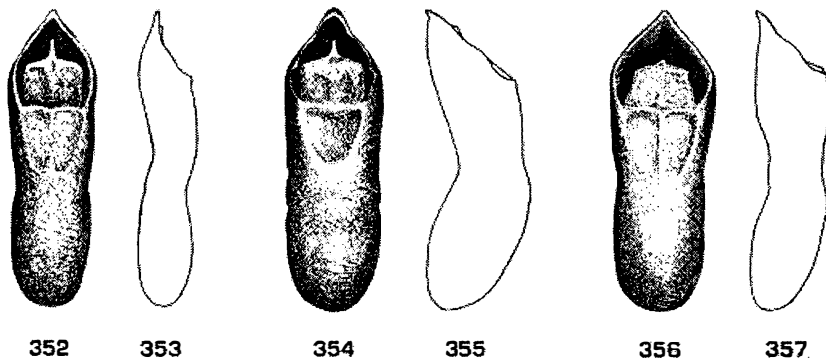
1. Pronotum finely punctate ..... **2.**
- . Pronotum strongly punctate ..... **5.**
2. Fore teeth on clypeus very broad (fig. **345**), reaching lateral edges. Pronotum bluish black, sometimes greenish black, metallic reflex rather strong. Elytra with humeral spot, in male largely smooth, in female finely reticulate. Length 7.7-9.2 mm (male) to 6.6-7.8 mm (female). Aedeagus as in figs **346**, **347** (= *armeniaca* LACORDAIRE, 1848, *croceopennis* MOTSCHULSKY, 1849). Distributed in Asia Minor, Caucasian countries and N Iran ..... ***brevipennis*** FALDERMANN, 1837.
- . Fore teeth on clypeus smaller, nor reaching lateral edges ..... **3.**
3. W Palaearctic species. Upper side, especially ground of pronotum, smooth and shining, metallic sheen rather strong, greenish or bluish. Length 5.6-9.2 mm (= *fulgida* LACORDAIRE, 1848, *albipennis* LACORDAIRE, 1848). Two geographical forms are known: smaller (5.6-7.9 mm), external margin of mandibula not emarginate (fig. **350**), humeral spot sometimes absent (*lucida* s. str.) and larger, external margin of mandibula deeply emarginate (fig. **351**), humeral spot always present (subsp. *axillaris* LACORDAIRE 1848 = *laticollis* LACORDAIRE, 1848, *sareptana* KRAATZ, 1872). Distribution: *lucida* s. str. from northern Spain to Slovakia and Slovenia, subsp. *axillaris* from Trieste and southern Germany to basin of Volga and Caucasian countries. In Middle Europe (Austria, Slovenia, Hungary) exists probably a zone of hybridation of both forms ..... ***lucida*** (GERMAR, 1824).

- E Palearctic species; humeral spots always distinct, black, puncturation of pronotum variable, usually fine mid part often extremely fine or absent. Ground of pronotum smooth, often mirror-like. Hairs on pronotum variable, shorter or longer, always adpressed, usually visible only in fore angles and in hind part ..... 4-



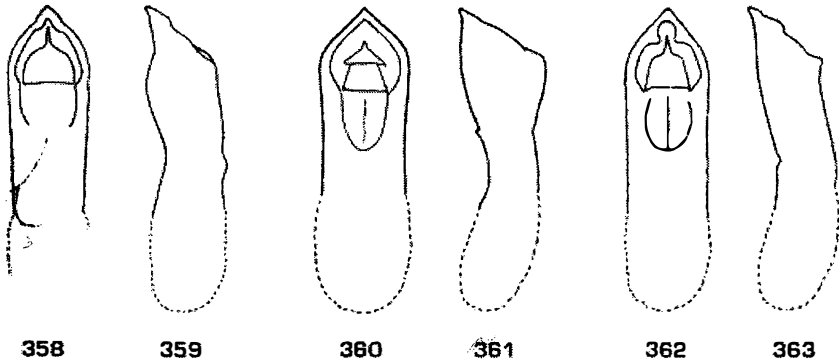
Figs 346-351 (after WARCHAŁOWSKI 1986): 346-349 – aedeagus in dorsal and lateral view: 346, 347 – *Labidostomis (Labidostomis) brevipennis*; 348, 349 – left mandibula in lateral view: 350 – *L. (L.) lucida* s. str.; 351 – *L. (L.) lucida axillaris*.

- 4. Apical part of aedeagus moderately elongate, as in figs 352, 353. Outer edge of mandibulae not sharp (= *bipunctata* MANNERHEIM, 1825 nec FORSBERG, 1821, *mannerheimi* MONRÓS, 1953, here perhaps also *bisignata* FALDERMANN, 1835). Distributed in Mongolia, Transbaicalia and N China .....  
 ..... *urticarum* FRIVALDSZKY, 1892.
- Apical part of aedeagus elongate, similar as in *lepida* (figs 303, 304). Outer edge of mandibulae sharp ..... *amurensis nigrilabris* MEDVEDEV, 1980.



Figs 352-357. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1986): 352, 353 – *Labidostomis (Labidostomis) urticarum*; 354, 355 – *L. (L.) humeralis*; 356, 357 – *L. (L.) longimana*.

- 5. Body larger, length 8.5–11.0 mm. Humeral spot great, black, always very distinctly pronounced (= *impressihumera* LACORDAIRE, 1848). Aedeagus as in figs 354, 355. Distributed from central France and southern Sweden to Asia Minor and basin of Volga ..... **humeralis** (SCHNEIDER, 1792).
- . Body smaller, length under 8.0 mm ..... 6.
- 6. External margin of madibula straight ..... 8.
- . External margin of mandibula curved, pronotum strongly punctate ..... 7.



Figs 358-363. Aedeagus in dorsal and lateral view (358, 359 after TOMOV 1989, remaining after TOMOV 1990): 358, 359 – *Labidostomis (Labidostomis) balcanica*; 360, 361 – *L. (L.) tymphristica*; 362, 363 – *L. (L.) graeca*.

- 7. Aedeagus as in figs 356, 357. General view as in plate X, phot. 89. Length 4.2–6.8 mm. Pronotum greenish-black, humeral spot small, brownish, often absent (= *pallida* FOURCROY, 1785, *uralensis* LACORDAIRE, 1848, *glycyrrhizae* BECKER, 1880). Sometimes pronotum greenish-bluish, particularly strongly (ab. *dalmatina* LACORDAIRE, 1848), or on the contrary finer punctate (ab. *caucasica* MEDVEDEV, 1962). Distributed from southern Italy, northern Spain and southern Sweden to central Russia and Mongolia ..... **longimana** (LINNAEUS, 1761).
- . Aedeagus as in figs 358, 359, remaining external characters as in *longimana* (thesis 6). Length 6.0–6.8 mm. Described from Dalmatia ..... **balcanica** TOMOV, 1987.
- 8. Aedeagus as in figs 360, 361. Clypeus in the middle with a small tooth, remaining external characters as in *longimana* (thesis 6). Length 5.2–7.5 mm. Described from Greece. Perhaps a form of *longimana* ..... **tymphristica** TOMOV, 1990.
- . Aedeagus as in figs 362, 363. Clypeus in the middle without tooth, remaining external characters as in *longimana* (thesis 6). Described from Greece. Perhaps conspecific with *balcanica* (antithesis 6). Described from Greece ..... **graeca** TOMOV, 1990.

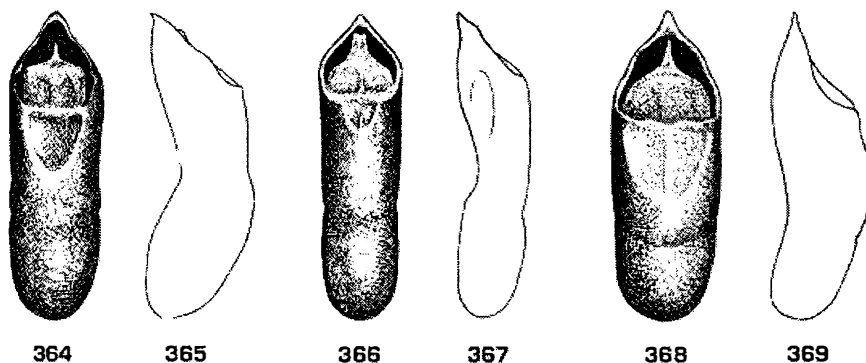
Auxiliary group H

Labrum dark, inner side of mandibulae sloping or almost vertical. Hairs on pronotum semierect, erect or absent, in hind part no more densely pubescent areas.



Key to species

1. Elytron with a humeral spot and a longitudinal stripe in posterior part, suture also often narrowly blackened. Pronotum on almost whole surface covered by very short, semierect hairs. Aedeagus as in figs **364**, **365**, very broad, with two longitudinal impressions on apical part of underside. Length 7.8–8.9 mm (female) to 8.6–9.4 mm (male) (= *limbata* LACORDAIRE, 1848, *jota* LEFÈVRE, 1872). Distributed in southern Turkey, Israel, Lebanon and western Syria ..... **hebraea** (LACORDAIRE, 1848).
- Elytron with a humeral spot only ..... **2**.
2. Pronotum very densely punctate, interstices on average narrower than diameter of punctures. Whole surface of pronotum covered by dense, long (100–120  $\mu$ m) hairs. Puncturation of elytra very strong, dense, confluent here and there in short wrinkles. Aedeagus as in figs **366**, **367**. Length 7.1–8.9 mm (female) to 7.6–10.4 mm (male). Distributed in Balkans and in Asia Minor ..... **rufa** (WALT, 1838).
- Pronotum not particularly densely punctate, interstices not narrower than diameter of punctures ..... **3**.
3. Mandibles bowl-like (fig. **370**). Hairs on pronotum very long (160–180  $\mu$ m). Aedeagus as in figs **368**, **369**. Poorly studied species, known a single pair only. Described from Sanamein (Syria) ..... **basanica** SAHLBERG, 1913.
- Mandibles not bowl-like ..... **4**.

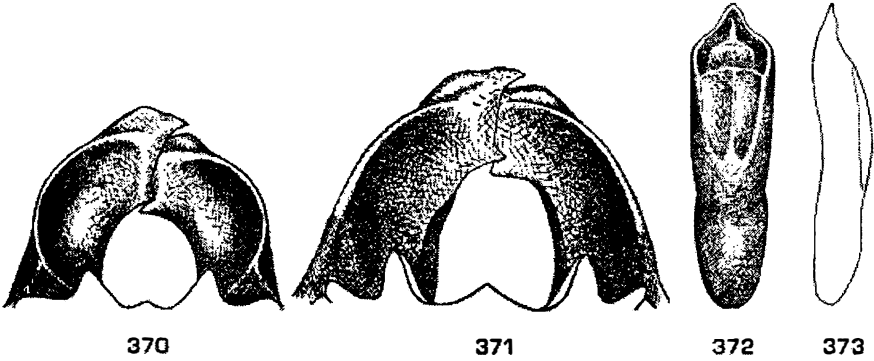


Figs 364-369. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1986): 364, 365 – *Labidostomis* (*Labidostomis*) *hebraea*; 366, 367 – *L. (L.) rufa*; 368, 369 – *L. (L.) basanica*.

4. External margin of mandibles (fig. **371**) very high, almost as in *beckeri* (auxiliary group K, thesis 8). Black humeral spot in female always distinct, in male often reduced, small and brownish. Hairs on pronotum fine and sparse, moderately long (100–120  $\mu$ m). Length 6.5–7.2 mm (female) to 7.3–9.7 mm (male). Distributed in Tien Shan mts (Kirgisia, Tadshikistan) ..... **fedtsdhenkoi** LOPATIN, 1963.
- External margin of mandibles not very high ..... **5**.
5. Body very large, length rarely under 10.5 mm. Head and pronotum in male usually with bluish metallic sheen, in female also bluish black, but often black with

greenish or bronzy reflex. Hairs on pronotum uniformly scattered, long (on average 18–220 μm). Aedeagus as in figs 374, 375. Elytra densely punctate, punctuation confluent here and there in short wrinkles. Length 9.2–11.2 mm (female) to 10.8–13.8 mm (male). Distributed in Asia Minor and in Caucasian countries ....

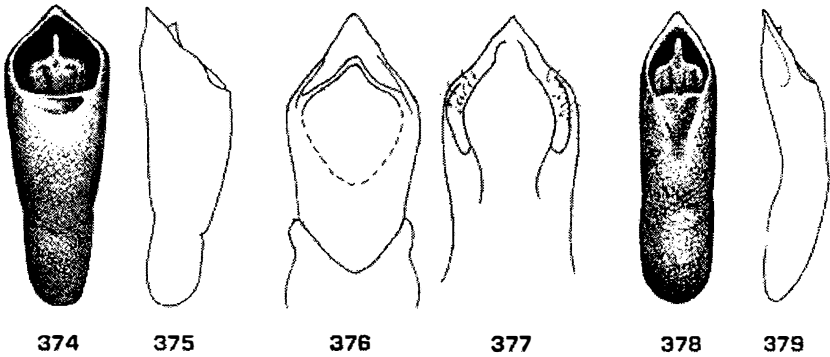
- ..... *asiatica* FALDERMANN, 1837.
- . Body smaller, not over 10.5 mm ..... 6.



Figs 370-373 (after WARCHAŁOWSKI 1986): 370, 371 – mandibulae, 372, 373 – aedeagus in dorsal and lateral view: 370 – *Labidostomis (Labidostomis) basanica*; 371-373 – *L. (L.) fedtschenkoi*.

6. Body larger. Species from Circumcaspiian area. External characters as in *peregrina* auxiliary group C, antithesis 3, but pronotum more distinctly covered by short hairs. Aedeagus as in figs 376, 377. Length 9.0–10.5 mm. Probably a form or race of *peregrina*. Described from NW Iran .....

- ..... *boreopersica* LOPATIN, 1997.
- . Body smaller, its length at most 8.0 mm ..... 7.



Figs 374-379. Aedeagus in dorsal, ventral and lateral view (376, 377 after LOPATIN 1997, remaining after WARCHAŁOWSKI 1986): 374, 375 – *Labidostomis (Labidostomis) asiatica*; 376, 377 – *L. (L.) boreopersica*; 378, 379 – *L. (L.) crebrecollis*.

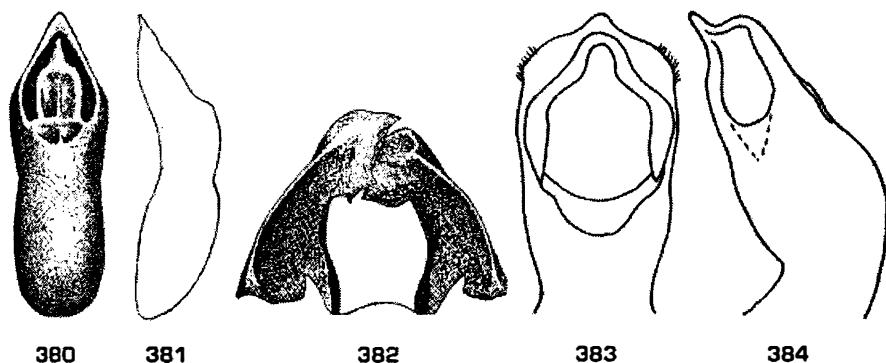
7. Length 6.0–7.4 mm (female) to 6.8–8.0 mm (male). Head and pronotum black with greenish metallic reflex. Elytra ochraceous, humeral spot small, brownish, in male sometimes absent. Aedeagus as in figs 378, 379. Hairs on pronotum rather long (90–120  $\mu\text{m}$ ), semierect, on lateral convexities erect. Distributed in Mongolia, N China, basin of Amur and Korea ..... *crebrecollis* MEDVEDEV, 1962.
- . Length 5.0 mm (female) to 6.5 mm (male). Apex of aedeagus rounded with short and rather broad triangular lamella. In male outer edge of mandibulae straight, sharp, general outline of mandibulae approximately as in *lepida* (auxiliary group B, thesis 2), spermatheca not studied. Broadly distributed in Transcaspia .....  
 ..... *curta* LOPATIN, 1961.

### Auxiliary group I

Labrum dark, inner side of mandibulae slopping or almost vertical. Hairs on pronotum in hind part form two densely pubescent areas.

#### Key to species

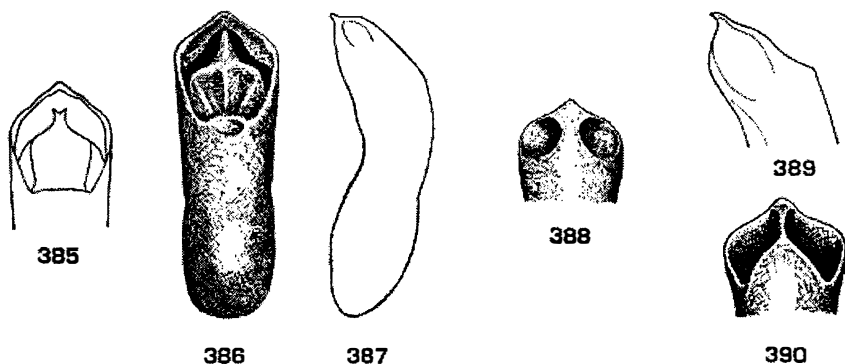
1. Mandibulae (fig. 382) very long, straight. Body length over 10.0 mm. Apex of aedeagus (figs 380, 381) triangular, it does form an angle of about 60°. Humeral spot roundish, in female black, in male brown, always present. Puncturation of upper side fine to moderately strong, ground reticulation very fine. Length 8.4–9.2 mm (female) to 10.8–12.0 mm (male) (= ?*alaiensis* PIC, 1920). Distributed from Turkmenia to W Tien Shan mts ..... *stenostoma* WEISE, 1900.
- . Mandibulae shorter, body length under 9.0 mm. Apex of aedeagus shorter, it does form an angle of about 80–120° ..... 2.



Figs 380–384. Aedeagus in dorsal, ventral and lateral view, mandibulae (383, 384 after LOPATIN 1995, remaining after WARCHAŁOWSKI 1986): 380–382 – *Labidostomis (Labidostomis) stenostoma*; 383, 384 – *L. (L.) cheni*.

2. Lateral impressions on underside of aedeagus short roundish, deep, interval flat. Two species very similar to each other, differing by their distribution ..... 3.

- Lateral impressions on underside of aedeagus oval, deep, interval flat ..... 4.
- 3. Species from East Asia. Aedeagus as in figs **383, 384**. Length 6.6–8.3 mm. Distributed in NE China ..... *cheni* LOPATIN, 1995.
- Species from Central Asia. Reticulation of elytra sometimes shallow, but always well-perceptible. Aedeagus as in fig. **385**. Length 5.6–7.1 mm (female) to 6.4–8.0 mm (male). Distributed in N Iran, Turkmenia and Tadshikistan .....  
..... *rugicollis* LEFÈVRE, 1872.



Figs 385-390. Aedeagus (or its apical part only) in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1986): 385 - *Labidostomis (Labidostomis) rugicollis*; 386-388 - *L. (L.) senicula*; 389, 390 - *L. (L.) deserta*.

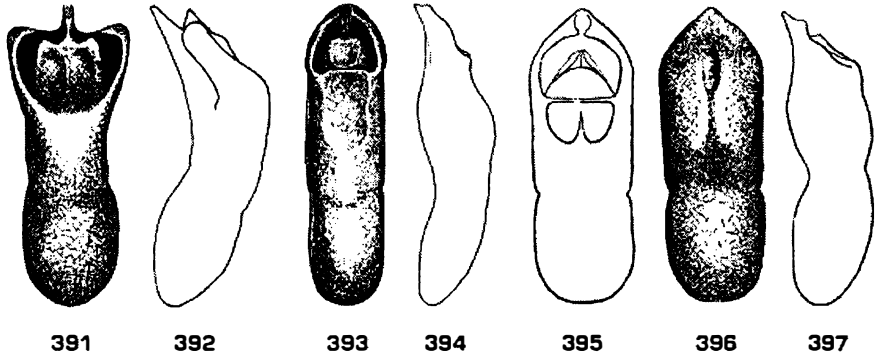
- 4. Interval between impressions on underside of aedeagus broad. On pronotum hairs on pubescent areas very dense. Elytra pale grey-yellowish, humeral spot in both sexes present, in male sometimes very small. Puncturation of upper side fine (on pronotum about 15–20  $\mu$ m, on elytra 30–40  $\mu$ m). Aedeagus as in figs **386–388**. Length 5.8–7.4 mm (female) to 7.2–9.0 mm (male) (= *nitida* BALLION, 1878, *albida* JACOBSON, 1894, *turcomanica* LOPATIN, 1954). Distributed in Kopet-Dag, Hindukush and Tien Shan mts ..... *senicula* KRAATZ, 1872.
- Interval between impressions on underside of aedeagus very narrow, edge-like. Hairs on pronotum moderately long (to 100  $\mu$ m), adpressed. Aedeagus as in figs **389, 390**. Length 6.0–7.2 mm (female) to 6.8–8.1 mm (male). Distributed in Kazakhstan, Tadzhikistan and Usbekistan ..... *deserta* MEDVEDEV, 1971.

#### Auxiliary group J

Aedeagus conspicuously formed, its apex broad, almost transversely cut, with a finger-like process. One species only.

Externally similar to *longimana*. Pronotum relatively strongly punctate, very sparsely covered by fine, adhering hairs or almost bare. Puncturation of elytra similar as on pronotum or even somewhat stronger. Aedeagus as in figs **391, 392**. Length 4.6–5.4 mm

(female) to 4.5–6.3 (male) (= *cyprius* LOPATIN, 1962). Distributed in Cyprus, Asia Minor and NW Syria ..... ***karamanica*** WEISE, 1900.



Figs 391-397. Aedeagus in dorsal, ventral and lateral view (after WARCHALOWSKI 1986): 391, 392 – *Labidostomis (Labidostomis) karamanica*; 393, 394 – *L. (L.) cavifrons*; 395-397 – *L. (L.) imitatrix*.

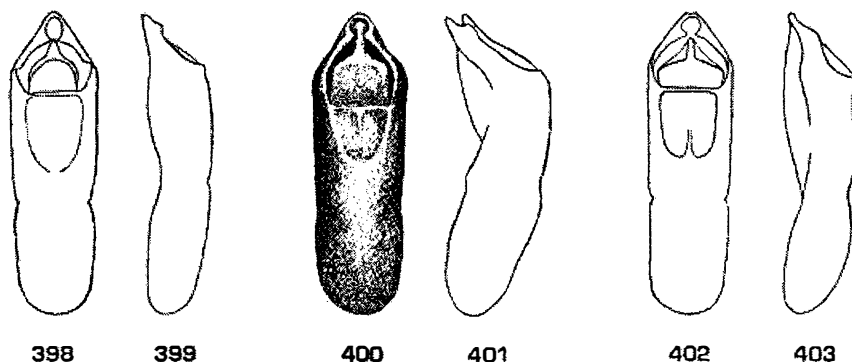
### Auxiliary group K

Apical margins of aedeagus on dorsal side with two small teeth.

#### Key to species

1. W Mediterranean species. Humeral spot distinct, oval. Pronotum moderately strongly (40–50 µm) punctate, covered by rather short (60–80 µm), adpressed hairs, its surface distinctly reticulate, weakly shining. Elytra uniformly punctate, almost matt. Length 9.9 mm. Known one male only. Described from Morocco ..... ***cavifrons*** LEFÈVRE, 1872.
- . Asiatic and E European species ..... **2.**
2. Outer margin of mandible not elevated ..... **3.**
- . Outer margin of mandible elevated ..... **5.**
3. Apical part of aedeagus (figs **395–397**) on underside with a median longitudinal hollow. Pronotum finely punctate, ground reticulation absent or present at margins only. Pronotum finely punctate, covered by fine, sparse, adpressed hairs. Elytra strongly and densely punctate. Length 5.5–6.5 mm (female) to 6.5–7.5 mm (male). Variations: pronotum not very densely punctate, on elytra humeral spot only (typical form), pronotum densely punctate, on each elytron a brownish stripe along lateral margin (unnamed). Distributed in basin of Lena (E Siberia) ..... ***imitatrix*** OGLOBLIN et MEDVEDEV, 1971.
- . Aedeagus on underside without median hollow ..... **4.**
4. On each elytron, behind humeral spot, a longitudinal brownish stripe running along lateral margin. In male inner side of mandible very gently sloping, almost as in

- in *schneideri* (auxiliary group E). Length 5.4–5.8 mm (female) to 6.2–7.1 (male). Distributed in Tadshikistan ..... ***glasunowi*** JACOBSON, 1893.
- . On each elytron humeral spot only, sometimes also a central spot (not lateral stripe) blackish. Distributed in SE Europe and W Asia, north to about 55°, west and south to NE Turkey, N Iran, N Afghanistan, NW China and C Mongolia. Forms a few geographical subspecies ..... ***metallica*** (LEFÈVRE, 1872).

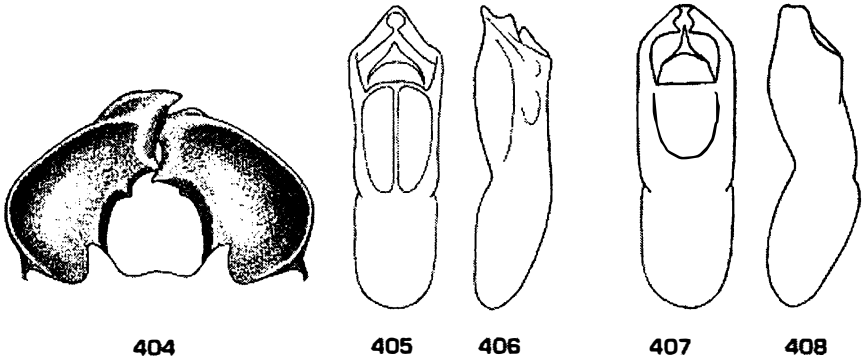


Figs 398-403. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1986): 398, 399 – *Labidostomis* (*Labidostomis*) *glasunowi*; 400, 401 – *L. (L.) metallica* s. str.; 402, 403 – *L. (L.) metallica centrisculpta*.

#### Key to subspecies

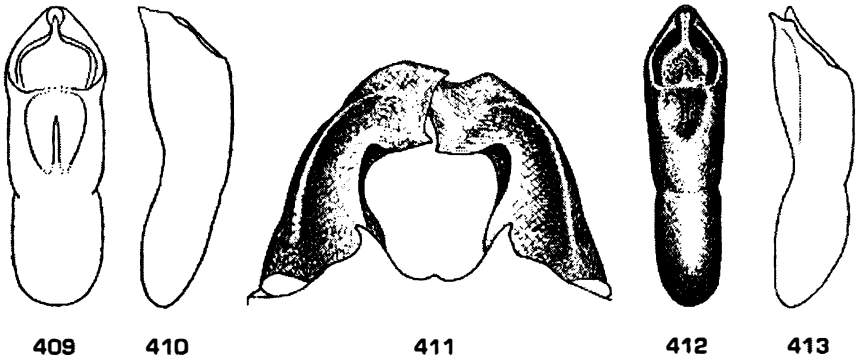
- a. On each elytron a central blackish spot. Length 6.5–8.0 mm. Occurs in S Kazakhstan ..... ***m. ornatipennis*** MEDVEDEV, 1971.
- . On each elytron humeral spot only ..... **b.**
- b. In male mandibles uniformly bent, at basis moderately broadened. Fore margin of clypeus with distinct, rather large tooth in the middle. Length 6.0–6.6 mm. Distributed west and north of Caspian Sea ..... ***m. metallica*** s. str.
- . In male mandibles at basis broadened. Fore margin of clypeus with a small, sometimes lobe-like tooth in the middle ..... **c.**
- c. Underside of aedeagus with a longitudinal median convexity ..... **d.**
- . Underside of aedeagus uniformly flat or gently convex ..... **e.**
- d. The mentioned convexity edge-like. Remaining characters as in nominotypical form. Length 6.3–7.0 mm (female) to 6.8–8.1 mm (male). Distributed in Kazakhstan from Caspian Sea to Altai mts ..... ***m. steppensis*** MEDVEDEV, 1971.
- . The mentioned convexity bulge-like. Remaining characters as in nominotypical form. Length 6.0–7.5 mm. Distributed in NW China and W Mongolia ..... ***m. dzhungarica*** MEDVEDEV, 1980.
- e. In male mandibles particularly large and broad (fig. 404). Larger, length 7.8–8.3 mm (female) to 8.2–10.7 mm (male). Pronotum at basis covered by dense, adpressed hairs. Perhaps a distinct species. Distributed in SE Usbekistan, SE Kazakhstan and W China ..... ***m. centrisculpta*** PIC, 1920.

- In male mandibles smaller. Smaller, length 6.8–7.2 mm (female) to 7.0–7.4 mm (male). Pronotum nowhere densely pubescent. Distributed in C Mongolia .....  
..... ***m. mongolica* MEDVEDEV, 1980.**
- 5. Outer margin of mandible moderately high elevated ..... **6.**
- Outer margin of mandible very high elevated ..... **8.**



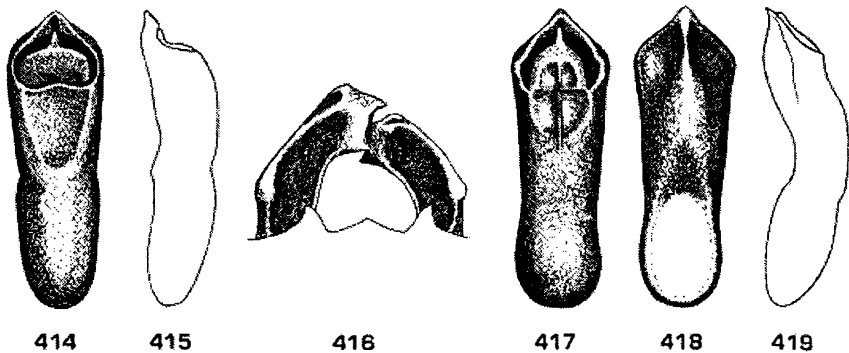
Figs 404-408 (after WARCHAŁOWSKI 1986). 404 – mandibula, 405-408 – aedeagus in dorsal and lateral view: 404 – *Labidostomis (Labidostomis) metallica centrisculpta*; 405, 406 – *L. (L.) metallica steppensis*; 407, 408 – *L. (L.) metallica dzhungarica*.

- 6. Mandibles straight. A species from Central Asia. Pronotum rather strongly punctate, covered by semierect hairs. Elytra rust-reddish, humeral spot in female distinct, in male small or absent. Length 5.5 mm (female) to 6.0–6.5 mm (male). Described from Kirgisia ..... ***issykensis* MEDVEDEV, 1971.**
- Mandibles curved. Species from W Asia ..... **7.**



Figs 409-413 (after WARCHAŁOWSKI 1986). 411 – mandibula, remaining – aedeagus in dorsal and lateral view: 409, 410 – *Labidostomis (Labidostomis) propinqua*; 411-413 – *L. (L.) medvedevi*.

7. Mandibles as in fig. 411. Clypeus with a very small tooth in the middle, clypeus almost quadrangularly excised. Body black with greenish sheen, elytra yellowish with dark brown humeral spot. Externally similar to *asiatica* (auxiliary group H, thesis 5) and *propinqua* (antithesis 7), but hairs on peronotum shorter. Vertex very densely and coarsely punctate. Aedeagus as in figs 412, 413. Length 7.0–10.0 mm (= *montana* MEDVEDEV, 1970, nec COBOS, 1954). Distributed in Caucasian countries, N Iran and Turkmenia ..... ***medvedevi*** WARCHAŁOWSKI, 1985.
- . Tooth in the middle of fore margin of clypeus rather large, distinctly triangular. External margin of mandibula moderately elevated. General view as in plate XI, **phot. 95**. Elytra yellowish, in living insects relatively very pale. Humeral spot always large, black. Aedeagus as in figs 409, 410. Length 8.5–10.7 mm (= *binotata* WALTZ, 1838, *stevenii* LACORDAIRE, 1848, *arnoldii* MEDVEDEV, 1962). Distributed in Bulgaria, S Romania, Greece, Asia Minor and Caucasian countries ..... ***propinqua*** FALDERMANN, 1837.



Figs 414-419 (after WARCHAŁOWSKI 1986). 416 – mandibula, remaining – aedeagus in dorsal and lateral view: 414-416 – *Labidostomis (Labidostomis) beckeri*; 417-419 – *L. (L.) ornata*.

8. On elytra black humeral spots only, in male small but distinct, in female larger, pitch-black. In mandibulae (fig. 416) inner side almost vertical, external margin high elevated. Length 6.5–7.8 mm. Distributed from basin of Dnieper to Altai Range ..... ***beckeri*** WEISE, 1881.
- . On each elytron black humeral spot and a great, brownish spot in the middle. Aedeagus as in figs 417–419. Length 5.4 mm (female) to 6.3–7.0 mm (male) (= *signatipennis* LOPATIN, 1963). Described from Kirgisia ..... ***ornata*** MEDVEDEV, 1962.

#### Auxiliary group L

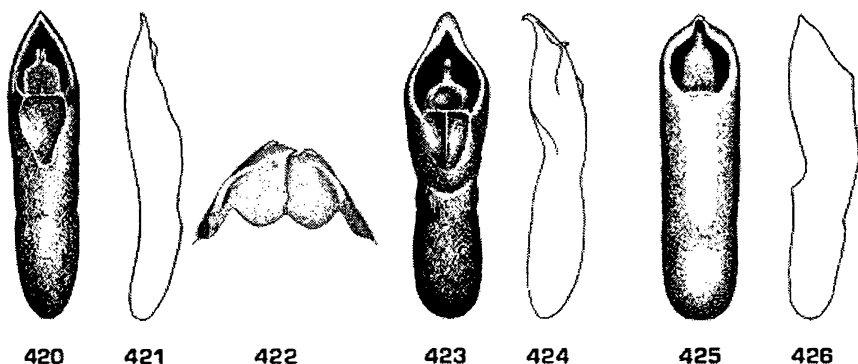
Antennomeres 1–3 normal, 4–11 expanded, margins of apex of aedeagus on dorsal side without any teeth. W Mediterranean species.



Key to species

A. Males.

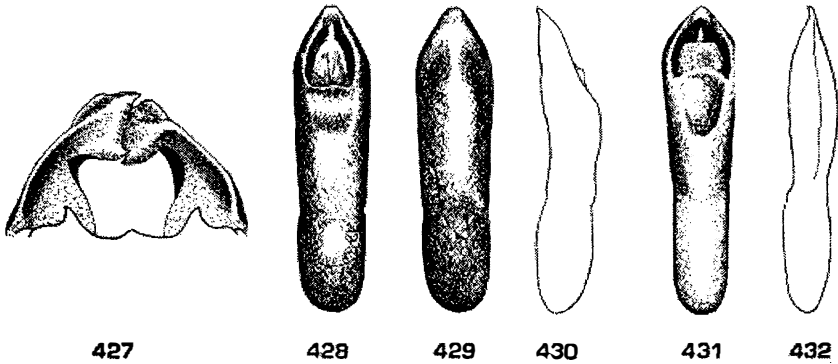
1. Mandibulae (fig. 422) very little increased. Pronotum covered with very long hairs. On each elytron usually two spots. General view as in plate XI, phot. 92. Aedeagus as in figs 420, 421. Length 8.0–8.8 mm (= *hybrida* LUCAS, 1845, = *roberti* PIC, 1919). Variations: on each elytron humeral spot only (ab. *deficiens* KOCHER, 1958), on each elytron posterior spot transformed in a great, transverse stripe (ab. *posticejuncta* PIC, 1912), on each elytron humeral and posterior spots fused, forming a longitudinal stripe (ab. *bijuncta* PIC, 1912), sometimes the both longitudinal stripes fused also anteriorly (ab. *bisbijuncta* PIC, 1912). Distributed in NW Africa .....  
 ..... ***quadrinotata*** (FABRICIUS, 1787).
- Mandibulae strongly increased ..... **2.**



Figs 420-426 (after WARCHAŁOWSKI 1986). 422 – mandibula, remaining – aedeagus in dorsal and lateral view: 420-422 – *Labidostomis (Labidostomis) quadrinotata*; 423, 424 – *L. (L.) lusitanica*; 425, 426 – *L. (L.) mairei*.

2. External margin of mandibula very high elevated. Aedeagus as in figs 152, 153, its apex curved downwards. Length 5.9–8.6 mm (= *scapularis* LACORDAIRE, 1848, *tibialis* LACORDAIRE, 1848, *croceopennis* MOTSCHOUJSKY, 1849, *bigemina* SUFFRIAN, 1851, *lacordairei* REICHE et SAULCY, 1858, *quadrinotata* MOTSCHOUJSKY, 1849, *pseudohumeralis* MEDVEDEV, 1962, here also probably *hispanica* LACORDAIRE, 1848). Very variable. Sometimes a black spot in posterior part of each elytron is present (ab. *meridionalis* LACORDAIRE, 1848, known by different names). Distributed in north-western Africa, Spain, Portugal, southern France, north-western Italy and Sicily ..... ***lusitanica*** (GERMAR, 1824).
- External margin of mandibula not very high elevated ..... **3.**
3. On each elytron a great, bluish-black patch. Mandibulae as in fig. 427. General view as in plate XI, phot. 91. Aedeagus as in figs 425, 426. Length 6.3–7.9 mm. Variation: elytra almost entirely bluish-black with a reddish spot on apex (unnamed), on elytra pale lateral stripe present in anterior part only (ab. *subinterrupta* PIC, 1932). Occurs in High Atlas ..... ***mairei*** PEYERIMHOFF, 1922.
- Elytra unicolorous, reddish or orange ..... **4.**

4. Mandibula (fig. 433) in lateral view steadily narrowed. General view as in plate XI, phot. 96. Aedeagus as in figs 428–430. Length 7.9–12.2 mm (= *lucaniformis* LEFÈVRE, 1872, *mogadorica* ESCALERA, 1914). Distributed in north-western Africa .... *rubripennis* (LUCAS, 1845).
- . Mandibulae (fig. 434) in lateral view suddenly narrowed. Aedeagus as in figs 431, 432. General view as in plate XI, phot. 97. Length 7.7–12.4 mm (= *similis* SCHNEIDER, 1792, *sardoa* JACOBSON, 1906). Pronotum in male nude, in female covered with very short hairs. In southern Morocco occurs a local form: pronotum in male at least short, in female long hairy (subsp. *maroccana* LEFÈVRE, 1872). Distributed in western part of Mediterranean area ..... *taxicornis* (FABRICIUS, 1792).



Figs 427-432 (after WARCHALOWSKI 1986). 427 – mandibula, remaining – aedeagus in dorsal, ventral and lateral view: 427 – *Labidostomis (Labidostomis) mairei*; 428-430 – *L. (L.) rubripennis*; 431, 432 – *L. (L.) taxicornis*.

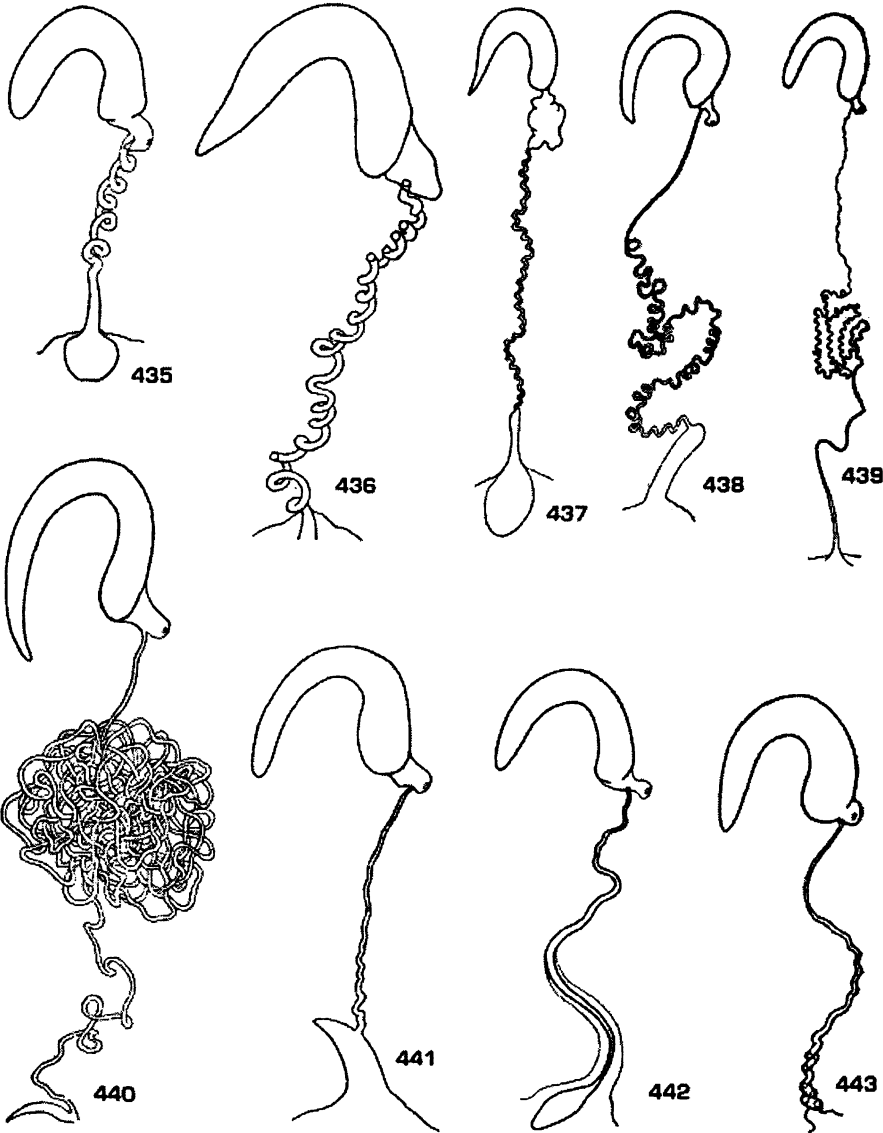
B. Females (here differential characters only; further details in the key to males).

Species not included in the key: *balcanica* TOMOV, 1987, from Dalmatia, externally similar to *longimana*, female genitalia not studied; *boreopersica* LOPATIN, 1997, from N Iran, externally similar to *peregrina*, spermatheca not studied; *cavifrons* LEFÈVRE, 1872, from Morocco, externally similar to *longimana*, female unknown; *graeca* TOMOV, 1990,



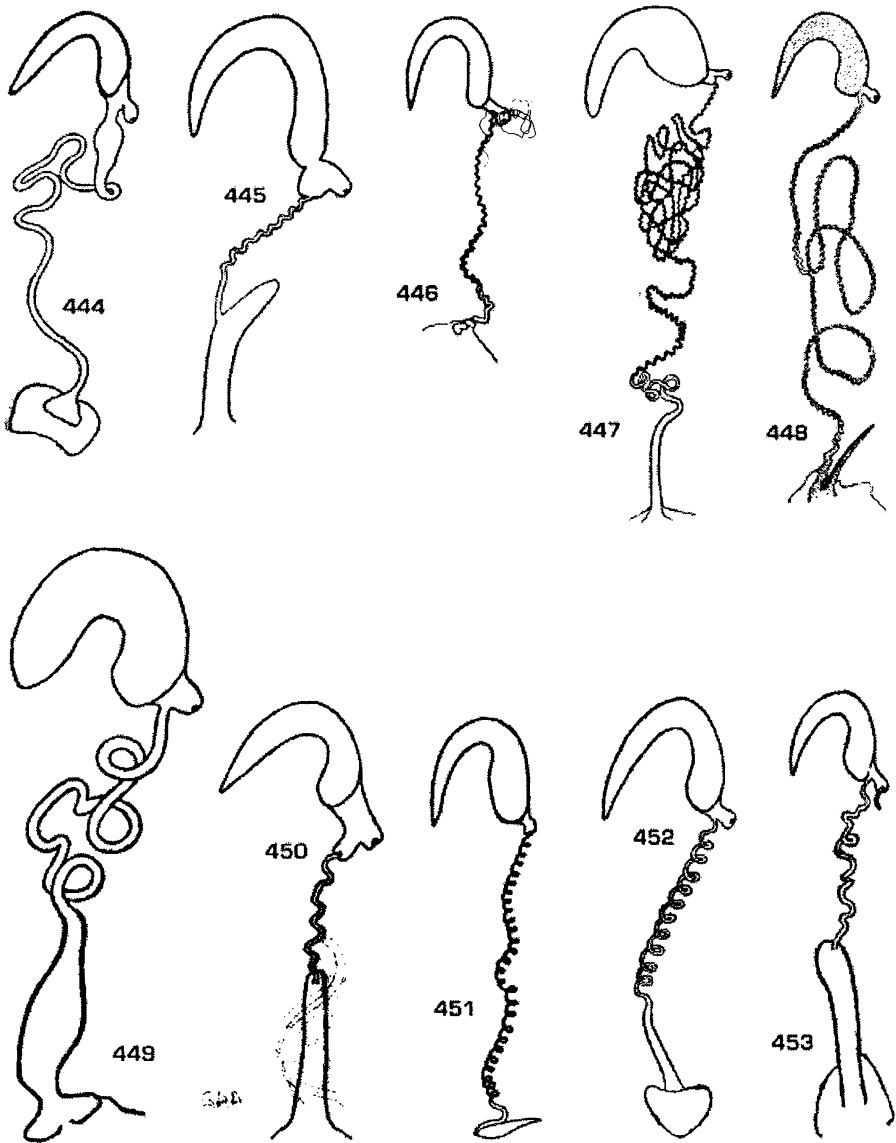
Figs 433, 434. Left mandibula in lateral view (after WARCHALOWSKI 1986): 433 – *L. (L.) rubripennis*; 434 – *L. (L.) taxicornis*.

from Greece, externally similar to *longimana*, female genitalia not studied; *issykensis* Medvedev, 1971 from Kirgisia, externally similar to *rufa*, but much smaller, female genitalia not studied; *lipskyi* LOPATIN, 1961 from Tadzhikistan, externally similar to *tridentata*, female unknown; *tymphristica* TOMOV, 1990, from Greece, externally similar to *longimana*, female genitalia not studied.



Figs 435-443. Spermatheca (after WARCHALOWSKI 1986): 435 - *Labidostomis (Labidostomis) amurensis*; 436 - *L. (L.) asiatica*; 437 - *L. (L.) beckeri*; 438 - *L. (L.) crebrecollis*; 439 - *L. (L.) (Chlorostola) centromaculata*; 440 - *L. (L.) (Labidostomis) bipunctata*; 441 - *L. (L.) brevipennis*; 442 - *L. (L.) arcuata*; 443 - *L. (L.) basanica*.

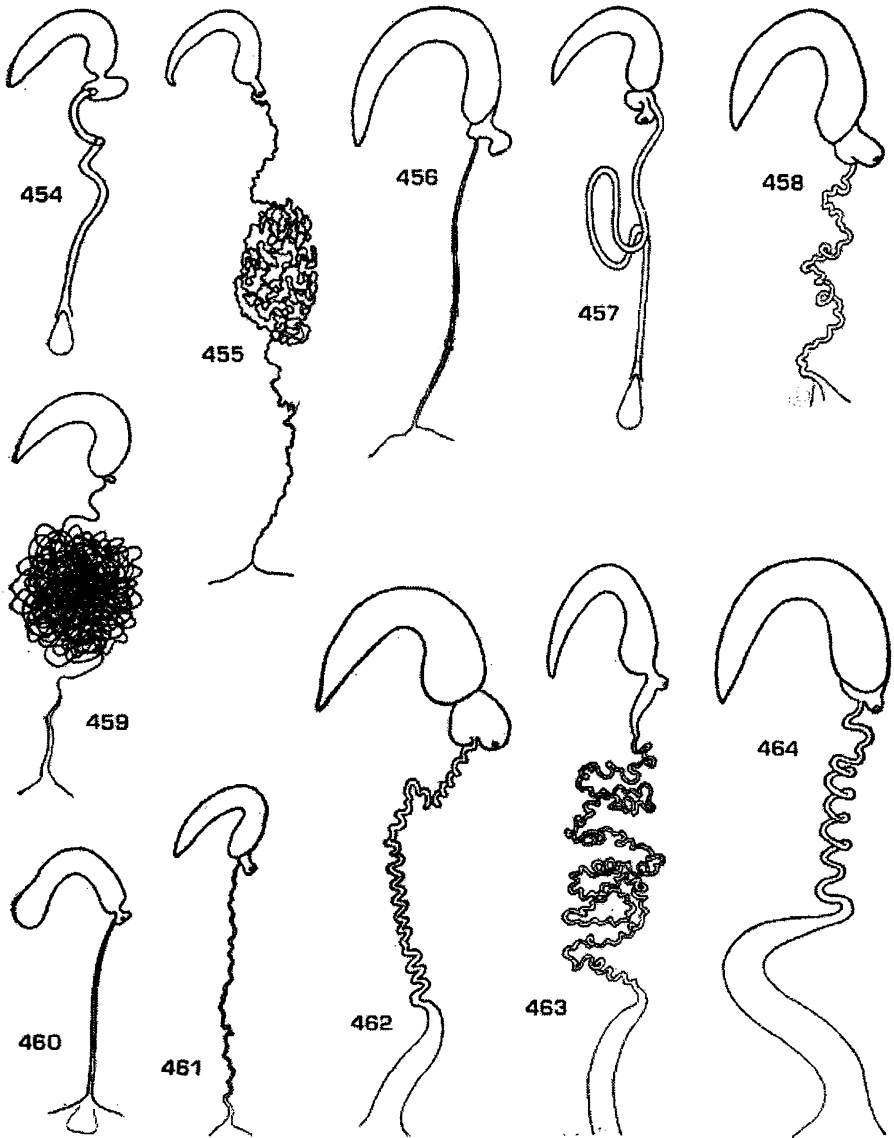
1. Elytra entirely pale or pale with dark humeral spot only ..... 2.
- . Elytra differently coloured ..... 46.
2. Elytra uniformly pale ..... 3.
- . Elytra pale with dark humeral spot ..... 9.



Figs 444-453. Spermatheca (after WARCHAŁOWSKI 1986): 444 - *Labidostomis (Labidostomis) cyanicornis*; 445 - *L. (L.) hebraea*; 446 - *L. (L.) deserta*; 447 - *L. (L.) elegans*; 448 - *L. (L.) diversifrons*; 449 - *L. (L.) humeralis*; 450 - *L. (L.) imitatrix*; 451 - *L. (L.) decipiens*; 452 - *L. (L.) glasunovi*; 453 - *L. (L.) fedtschenkoi*.

3. Labrum pale ..... **4**  
 - Labrum dark, usually blackish ..... **21**
4. Pronotum bare. Species from E Europe ..... *lepida* LEFÈVRE, 1872.  
 - Pronotum covered by hairs ..... **5**
5. Legs, sometimes also pronotum, pale. Species from S Turkey and Syria .....  
 ..... *testaceipes* PIC, 1904.  
 - Legs black or black with metallic reflex. Species distributed in Europe and W Asia ....  
 ..... **6**
6. Pronotum finely punctate ..... *pallidipennis* (GEBLER, 1830).  
 - Pronotum strongly punctate ..... *cyanicornis* GERMAR, 1822.
7. Vertex bare. Species widely distributed in W Palaearctic area .....  
 ..... *tridentata* (LINNAEUS, 1758).  
 - Vertex covered by hairs ..... **8**
8. Punctures on pronotum very unequal, mixed with small smooth, impunctate  
 areas. Spermatheca as in fig. 471. Species from NW Africa .....  
 ..... *rubripennis* (LUCAS, 1845).  
 - Punctures of pronotum strong, dense, here and there confluent. Surface of pro-  
 notum shining like brocade. Spermatheca as in fig. 484. W Mediterranean  
 species ..... *taxicornis* (FABRICIUS, 1792).
9. Pronotum anteriorly with a deep transverse furrow ..... **10**.  
 - Pronotum anteriorly without any furrow ..... **11**.
10. Furrow on pronotum deep and sharply incised. Species from Caucasian countries ...  
 ..... *kaszabi* MEDVEDEV, 1962.  
 - Furrow on pronotum distinct, but shallower. Species from Asia Minor .....  
 ..... *sulcicollis* (LACORDAIRE, 1848).
11. Pronotum bare. Species from E Siberia ..... **12**.  
 - Pronotum covered by hairs ..... **14**.
12. Ductus thick ( $\emptyset$  about 50  $\mu\text{m}$ ), as long as vasculum, ductus with less than 10 twists.  
 Species from Far East ..... *amurensis* HEYTDEN, 1884.  
 - Ductus thin ( $\emptyset$  under 15  $\mu\text{m}$ ) 3–6  $\times$  longer than vasculum, with at least 80 twists ....  
 ..... **13**.
13. Ductus as in fig. 486, shorter than elytra. Species from NE Asia .....  
 ..... *tjutschewi* JACOBSON, 1902.  
 - Ductus as in fig. 483, longer than elytra. Species from E Siberia .....  
 ..... *transitoria* JACOBSON, 1901.
14. Hairs on pronotum adpressed, forming in posterior part a transverse stripe or  
 two densely haired fields ..... **15**.  
 - Hairs on pronotum erect or semierect. On pronotum no densely haired areas ... **17**.
15. Species from Asia Minor, Caspian area and Caucasian countries ..... **16**.  
 - Species from Central Asia. Ductus about 2  $\times$  longer than vasculum, wavy, not  
 twisted ..... *arcuata* PIC, 1920.
16. Elytra almost matt. Ductus (fig. 448) with more than 100 twists. Species from  
 Libanon, Israel and Syria ..... *diversifrons* LEFÈVRE, 1872.  
 - Elytra shining. Ductus (fig. 451) with less than 100 twists. Species from Asia Minor  
 and Caucasian countries ..... *decipiens* FALDERMANN, 1837.
17. Hairs on pronotum very short (35–45  $\mu\text{m}$ ), erect, distinctly visible in lateral view ...  
 ..... **18**.  
 - Hairs on pronotum longer (60–100  $\mu\text{m}$ ) or very long (over 200  $\mu\text{m}$ ) ..... **19**.

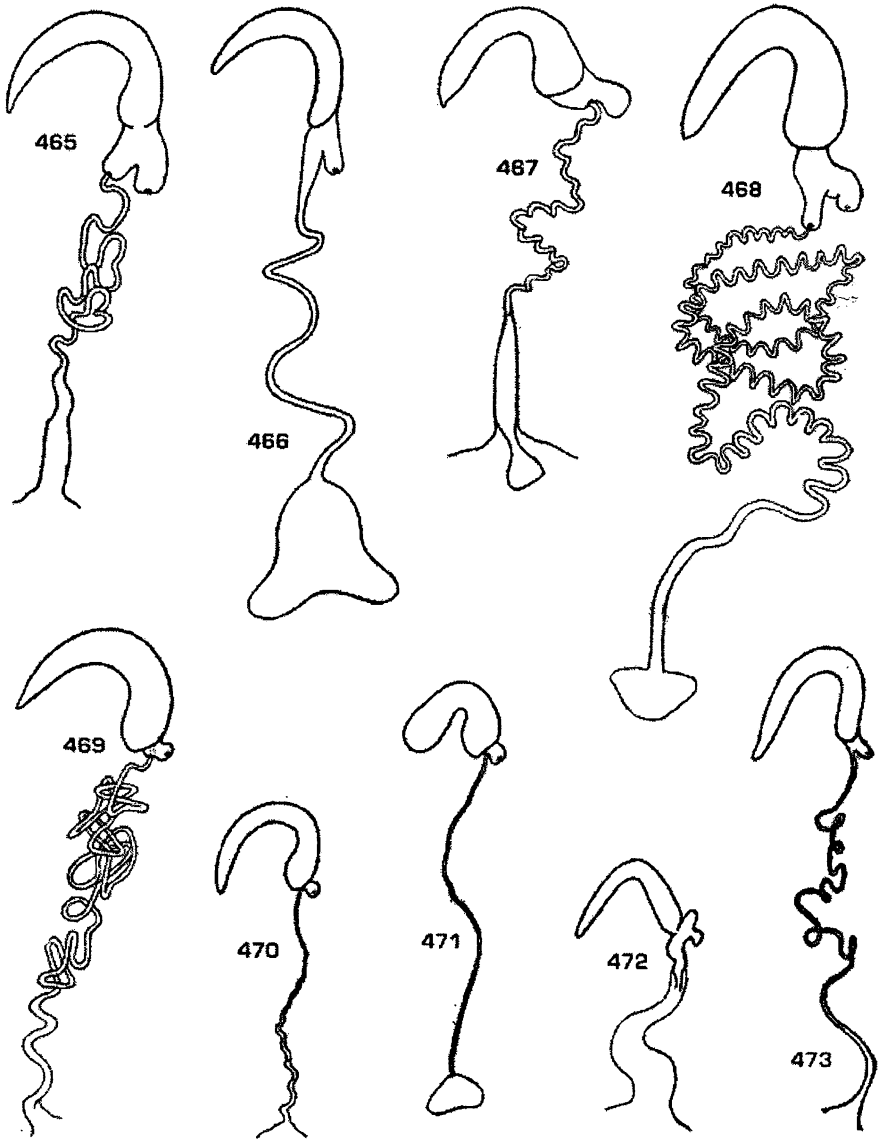
18. Length 6.7–7.2 mm, ductus as in fig. 461. Species from Asia Minor and Syria ....  
 ..... *mesopotamica* HEYDEN, 1886.  
 -. Length 6.8–8.1 mm, ductus as in fig. 473 ..... *peregrina* WEISE, 1900.  
 19. Species from Balkan Peninsula and Asia Minor ..... *oertzeni* WEISE, 1889.  
 -. Species from NE Iran ..... 20.



Figs 454-464. Spermatheca (after WARCHAŁOWSKI 1986): 454 - *Labidostomis (Labidostomis) karamanica*; 455 - *L. (L.) korbi*; 456 - *L. (L.) lepida*; 457 - *L. (L.) longimana*; 458 - *L. (L.) lucida*; 459 - *L. (L.) lusitanica*; 460 - *L. (L.) mairei*; 461 - *L. (L.) mesopotamica*; 462 - *L. (L.) medvedevi*; 463 - *L. (L.) metallica steppensis*; 464 - *L. (L.) maculipennis*.

20. Hairs on pronotum sparsely scattered, elytra finely punctate. Species from Iran ....  
 ..... **harazensis** RAPILLY, 1984.
- Hairs on pronotum more densely scattered, elytra moderately strongly punctate.  
 Species from N Iran and Caucasian countries ..... **martensi** MEDVEDEV, 1983.
21. Pronotum bare ..... **22**.
- Pronotum covered by hairs ..... **26**.
22. Pronotum finely or moderately strongly punctate ..... **23**.
- Pronotum strongly punctate ..... **25**.
23. Ductus short, at most 2 × longer than vasculum. W Palaearctic species ..... **24**.
- Ductus very long, forming a globulous coil. E Palaearctic species .....  
 ..... **urticarum** FRIVALDSZKY, 1892.
24. European species ..... **lucida** GERMAR, 1824.
- Species occurring in Asia Minor and Caucasian countries .....  
 ..... **brevipennis** FALDERMANN, 1837.
25. Length of body over 8.0 mm. Proximal part of ductus swollen (fig. 449). European  
 species ..... **humeralis** (SCHNEIDER, 1792).
- Length of body under 7.0 mm. W Palaearctic species. Proximal part of ductus not  
 swollen (here also larger specimens of *brevipennis*, antithesis 24) with pronotum  
 strongly punctate and *karamanica*, thesis 31, with very sparse hairs on pronotum ...  
 ..... **longimana** (LINNAEUS, 1761).
26. W Mediterranean species ..... **27**.
- E European and Asiatic species ..... **8**.
27. Pronotum covered by often sparse, adpressed hairs. Ductus very long, forming a  
 globulous coil (fig. 459). SW European species ..... **lusitanica** (GERMAR, 1824).
- Hairs on pronotum very long, erect, usually shaggy. Ductus absent, replaced by  
 an appendix of bursa (fig. 472). Here ab. *deficiens* of *quadrinotata* (thesis 51),  
 a N African species.
28. E Palaearctic species ..... **29**.
- W Palaearctic species ..... **30**.
29. Ductus very short (fig. 450). Here a pale form of *imitatrix* (thesis 49).
- Ductus long. Species from Far East ..... **crebrecollis** MEDVEDEV, 1962.
30. Species from SE Europe, Asia Minor and Near East ..... **31**.
- Species from Transcaspian area and Central Asia ..... **38**.
31. Length of body under 5.5 mm. Ductus as in fig. 454. Species from Asia Minor and  
 Cyprus ..... **karamanica** WEISE, 1900.
- Length of body over 5.5 mm ..... **32**.
32. Punctuation of pronotum fine ( $\emptyset$  under 30  $\mu\text{m}$ ) ..... **33**.
- Punctuation of pronotum moderately strong ( $\emptyset$  on average about 40  $\mu\text{m}$ ) .... **35**.
33. Hairs on pronotum long (on average 160–180  $\mu\text{m}$ ). Species from Syria .....  
 ..... **basanica** SAHLBERG, 1913.
- Hairs on pronotum much shorter (under 100  $\mu\text{m}$ ) ..... **34**.
34. Bulbus large, irregular, sack-shaped (fig. 437). Species from Black Sea area, Asia  
 Minor and Transcaspian area ..... **beckeri** WEISE, 1881.
- Bulbus normal, not sack-shaped (here also some subspecies of *metallica*). Species  
 from N Iran ..... **medvedevi** WARCHAŁOWSKI, 1985.
35. Pronotum very strongly and densely punctate, covered by erect hairs. Species from  
 Balkan Peninsula and Asia Minor ..... **rufa** (WALTZ, 1838).

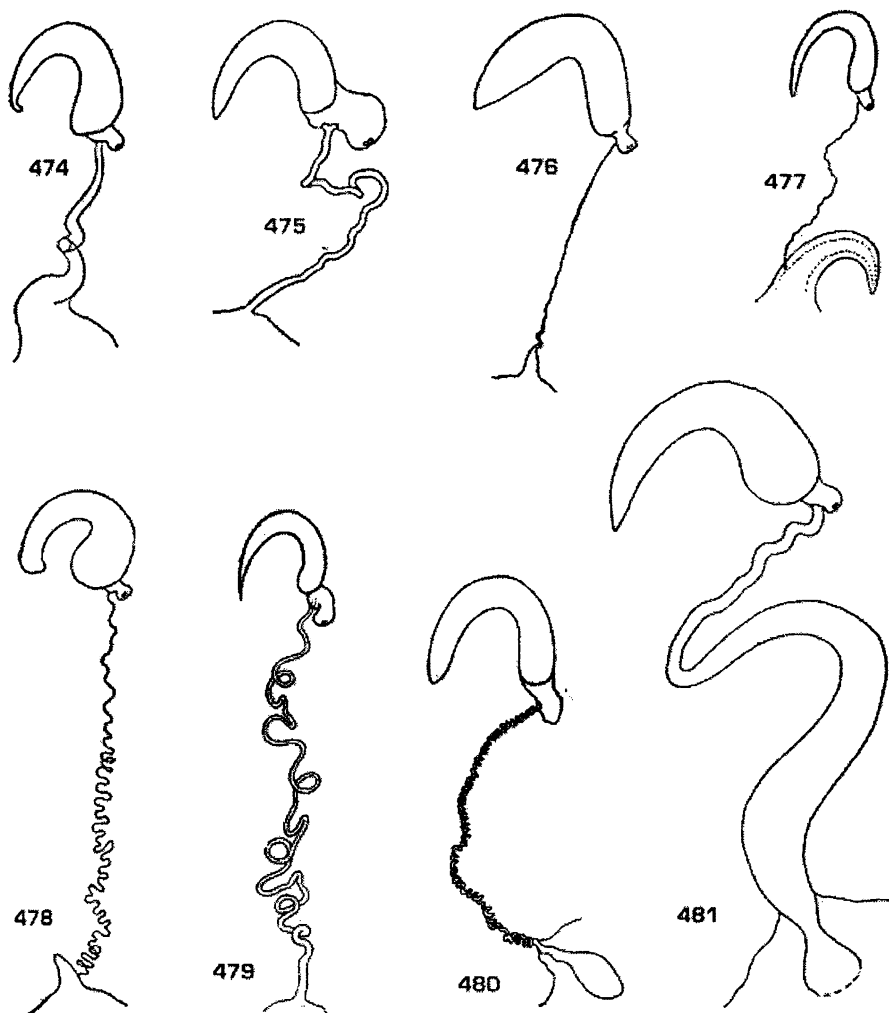
- Punctuation of pronotum moderately strong and not particularly densely scattered ... 36.
- 36. Length of body over 9.2 mm. Ductus 1.5 × longer than vasculum. Species from Asia Minor and Caucasian countries ..... *asiatica* FALDERMANN, 1837.
- Length of body over 9.0 mm. Ductus at least 2 × longer than vasculum ..... 37.



Figs 465-473. Spermatheca (after WARCHAŁOWSKI 1986): 465 - *Labidostomis (Labidostomis) metallica centrisculpta*; 466 - *L. (L.) pallidipennis*; 467 - *L. (L.) nuristanica afghanica*; 468 - *L. (L.) propinqua*; 469 - *L. (L.) rufa*; 470 - *L. (L.) oertzeni*; 471 - *L. (L.) rubripennis*; 472 - *L. (L.) quadrinotata*; 473 - *L. (L.) peregrina*.

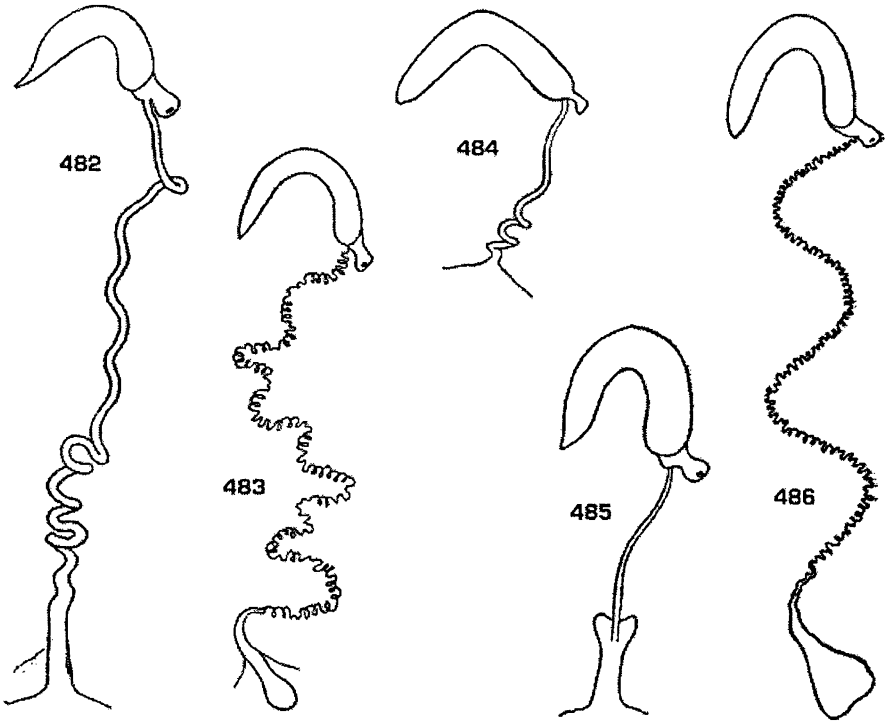


37. Ductus at least 4 × longer than vasculum, bulbus large, Y-shaped (fig. 468). Length of body on average about 9.5 mm. Species from Balkan Peninsula, Asia Minor and Caucasian countries ..... ***propinqua*** FALDERMANN, 1837.
- Ductus at most 2 × longer than vasculum, bulbus normal (fig. 473). Length of body on average about 8.0 mm. Species from Crimea and Circumcaspiian area ..... ***peregrina*** WEISE, 1900.
38. Hairs on pronotum adpressed, forming in posterior part a transverse stripe or two densely haired fields ..... **39.**
- Hairs on pronotum erect or semierect, on pronotum no densely haired areas ... **43.**



Figs 474-481. Spermatheca (after WARCHALOWSKI 1986): 474 - *Labidostomis (Labidostomis) senicula*; 475 - *L. (L.) stenostoma*; 476 - *L. (L.) schneideri*; 477 - *L. (L.) rugicollis*; 478 - *L. (L.) shirazica*; 479 - *L. (L.) sulcicollis*; 480 - *L. (L.) sibirica*; 481 - *L. (L.) subfasciata*.

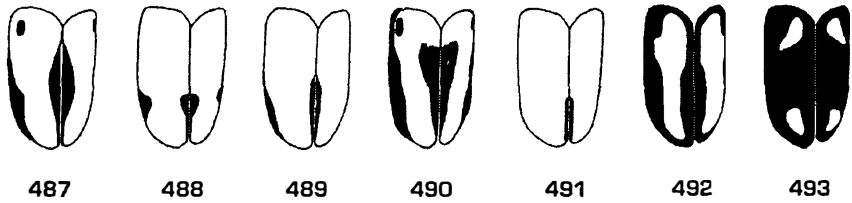
- 39. Bulbus very large (fig. 475), Length of body over 8.4 mm. Species from Turkmenia, Iran and Afghanistan ..... *stenostoma* WEISE, 1900.
- . Bulbus normal .....
- 40. Ductus very short ant thick, its proximal part change gradually into bursa (fig. 474). Species from Transcaspien area ..... *senicula* KRAATZ, 1872.
- . Ductus not very short and thick, not changing, but leading into bursa .....
- 41. Ductus short, very thin, wavy, not twisted. Species distributed in Transcaspien mountains, from Kopet-Dag to Tienshan ..... *rugicollis* LEFÈVRE, 1872.
- . Ductus twisted .....
- 42. Ductus about 3 × longer than vasculum, its proximal part relatively strongly thickened. Some subspecies of *metallica*.
- . Ductus short, about 1.5 × longer than vasculum (fig. 446), on whole length twisted, its proximal part only moderately thickened. Species from Central Asia ....  
..... *deserta* MEDVEDEV, 1971.
- 43. Bulbus large, irregular, sack-shaped (fig. 437). Species from Black Sea area, Asia Minor and Transcaspien area. See *beckeri* (thesis 34).
- . Bulbus normal .....



Figs 482-486. Spermatheca (after WARCHAŁOWSKI 1986): 482 – *Labidostomis (Labidostomis) testaceipes*; 483 – *L. (L.) transitoria*; 484 – *L. (L.) taxicornis*; 485 – *L. (L.) tridentata*; 486 – *L. (L.) tjutschwi*.

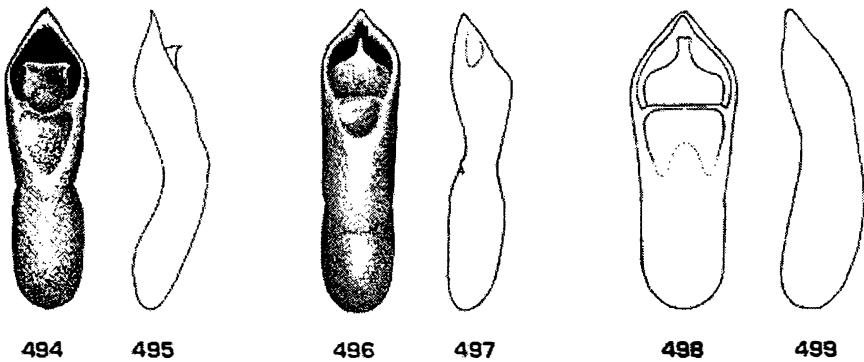
44. Bursa copulatrix with a finger-like process (fig. 453). Species from Tadshikistan and Kirgisia ..... ***fedtsdhenkoi*** LOPATIN, 1963.  
 -. Bursa copulatrix without any finger-like process ..... 33.
45. Ductus about as long as vasculum (fig. 476). Species from Central Asia .....  
 ..... ***schneideri*** WEISE, 1900.  
 -. Ductus about 3 × longer than vasculum, its proximal part relatively strongly thickened. Some subspecies of *metallica*.
46. W Mediterranean species ..... 47.  
 -. Asiatic species ..... 53.
47. Elytra uniformly greenish or bluish black, with metallic luster ..... 48.  
 -. Elytra partly yellowish or reddish ..... 49.
48. Hairs on antennae roughly erect, stiff. Metallic lustre stronger, usually greenish. Species from NW Africa and Iberian Peninsula ..... ***hordei*** (FABRICIUS, 1787).  
 -. Hairs on antennae semierect, thin. Metallic lustre rather weak, usually bluish. Unicolorous forms of *guerini* (antithesis 55).
49. Elytra pale with blackish pattern ..... 50.  
 -. Elytra metallic black-blue with reddish pattern on fore- lateral- or apical margin ....  
 ..... 52.
50. Pronotum particularly strongly and sparsely punctate. Elytra differently coloured (fig. 439), usually yellowish with a sutural, central black spot. Species distributed in Sardinia and Corsica ..... ***centromaculata*** (GÉNÉ, 1791).  
 -. Pronotum not very strongly punctate ..... 51.
51. Hairs on pronotum very long, erect, usually shaggy. On each elytron, except humeral spot one blackish spot in hind part. Species distributed in NW Africa ...  
 ..... ***quadrinotata*** (FABRICIUS, 1787).  
 -. Hairs on pronotum not very long, adpressed. On each elytron humeral spot and one blurred longitudinal brownish spot in central part. Some colour variations of *lusitanica* (thesis 27).
52. Hairs on elytra erect, uniform, here and there more condensed. Elytra black with bluish metallic lustre, theirs margins red. Length 4.6–4.9 mm .....  
 ..... ***rufomarginata*** (VAULOGER, 1895).  
 -. Hairs on elytra absent or sparse ..... 56.
53. Mid part of elytral margin reddish ..... 54.  
 -. Mid part of elytral margin black ..... 55.
54. Body length under 5.5 mm. General view as in plate X, **phot. 86**. Species from Spain .....  
 ..... ***nevadensis*** (DANIEL et DANIEL, 1904).  
 -. Body length over 6.0 mm. Spermatheca as in fig. 231. Species from Morocco .....  
 ..... ***mairei*** (PEYERIMHOFF, 1922).
55. Apical margin of elytron black. Species from Morocco and Spain. Length 3.7–4.8 mm .....  
 ..... ***bolivari*** (ANTOINE, 1936).  
 -. Apical margin of elytron reddish. Species from Algeria, Tunisia, Sicily and Italy. Length 4.0–5.2 mm ..... ***guerini*** (BASSI, 1834).
56. Elytra pale with blackish pattern ..... 57.  
 -. Elytra either uniformly black with metallic reflex or blue-black with reddish margins, see theses 54–55.
57. Labrum dark ..... 58.  
 -. Labrum yellow ..... 60.

58. On each elytron black humeral spot and longitudinal brown stripe ..... 59.  
 -. On each elytron black humeral dot and a large spot behind middle. Here *ornata* MEDVEDEV, 1962 (genitalia of female not studied) and *metallica ornatipennis* MEDVEDEV, 1971 (female unknown).



Figs 487-493 Colour variations in *Labidostomis (Chlorostola) centromaculata* (after WARCHALOWSKI 1986): 487 - typical form; 488 - ab. *syriaca* LACORDAIRE, 1848; 489 - ab. *quadrinotata* OLIVIER, 1791; 490 - ab. *lineata* PIC, 1920; 491 - ab. *suturella* PIC, 1920; 492 - ab. *obliterata* PIC, 1920; 493 - ab. *damryi* WEISE, 1881.

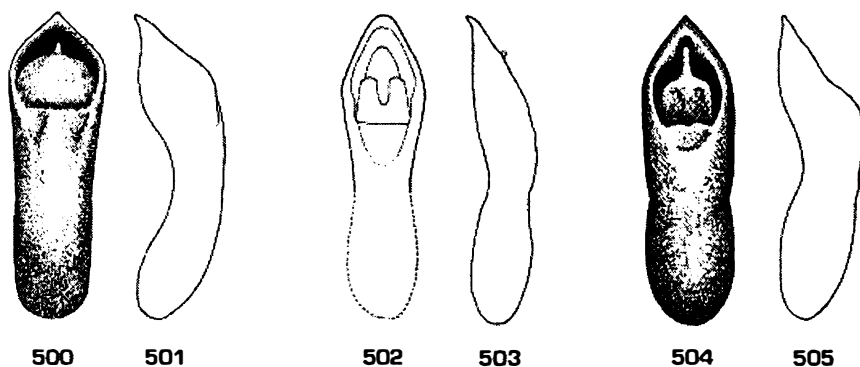
59. Length of body under 5.8 mm. Ductus as in fig. 452. Species from Tadzhikistan ...  
 ..... *glasunowi* JACOBSON, 1893.  
 -. Length of body over 5.8 mm. Ductus as in fig. 450. Species from Yakutia .....  
 ..... *imitarix* OGLOBLIN et MEDVEDEV, 1971.



Figs 494-499. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1986): 494, 495 - *Labidostomis (Chlorostola) hordei*; 496, 497 - *L. (C.) rufomarginata*; 498, 499 - *L. (C.) nevadensis*.

60. On each elytron a humeral dot and a longitudinal stripe in the middle of posterior part. Length 6.3-8.5 mm. Distributed from Syria and Cyprus to Caucasian countries and N Iran ..... *decipiens* FALDERMANN, 1837.  
 -. Elytra without longitudinal stripes ..... 61.

61. In the middle of each elytron a great, bluish, shining patch, always considerably (15–20 times) greater than humeral dot. Here fifth species: *elegans* LEFEVRE, 1876, *luristanica* PIC, 1920, *damavendensis* RAPILLY, 1984, *laeta* MEDVEDEV, 1992 and *kantneri* WARCHAŁOWSKI, 2004, distinguishable by characters given in the auxiliary group (key to males, p. 74).
- Elytra with black spots ..... **62.**
62. Body length under 7.5 mm. Black discal spot situated in the middle of elytron ... **63.**
- Body length over 8.0 mm. Black discal spot situated in anterior part of elytron ... **64.**



Figs 500-505. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1986): 500, 501 – *Labidostomis (Chlorostola) embergeri*; 502, 503 – *L. (C.) bolivari*; 504, 505 – *L. (C.) guerini*.

63. Ductus very long (fig. 455). Species described from Asia Minor ..... **korbi** WEISE, 1901.
- Ductus shorter and thicker (fig. 467). Species from Afghanistan ..... **nuristanica** REINECK, 1937.
64. Length under 9.5 mm. Pronotum nude. One discal spot only. Species from Circumcasian area ..... **maculipennis** LEFÈVRE, 1870.
- Length over 9.5 mm. Posterior part of pronotum covered by hairs. In anterior part of elytron two black spots side by side, the external spot sometimes absent. Species from Asia Minor, Caucasian countries and Iran ..... **subfasciata** WEISE, 1885.

#### Subgenus *Wellschmiedia* WARCHAŁOWSKI, 1985

One species only. Elytron yellowish with humeral dot and one black spot in posterior part, remaining parts of body pure black. In male mandibulae very small. General view as in plate XI, **phot. 99**. Aedeagus as in figs 278, 279. Length 5.0–5.6 mm. Occurs in Spain ..... **ghilianii** (LACORDAIRE, 1848).

*Lachnaea* auct.

Key to subgenera

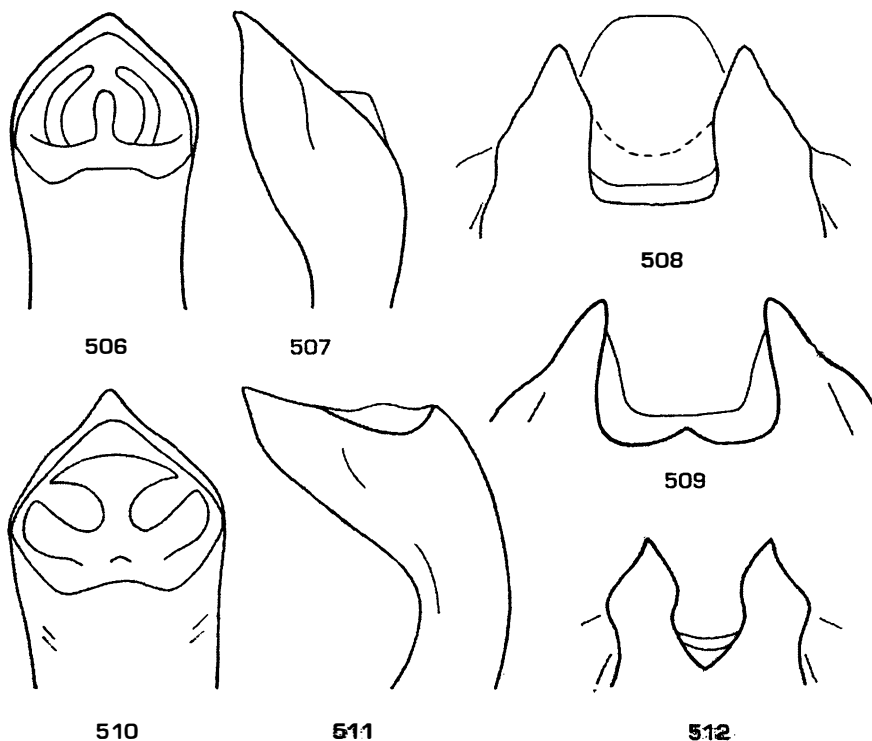
- 1. In male clypeus very deep excavated (fig. 291), the excavation rectangular or semicircular ..... *Barathraea* (p. 108).
- In male clypeus shallowly emarginate, the emargination usually triangular ..... *Lachnaia s. str.* (p. 110).

Subgenus *Barathraea* LACORDAIRE, 1848

Literature: TOMOV 1982.

Key to species

- 1. Elytra more or less haired ..... 2.
- Elytra glabrous ..... 3.



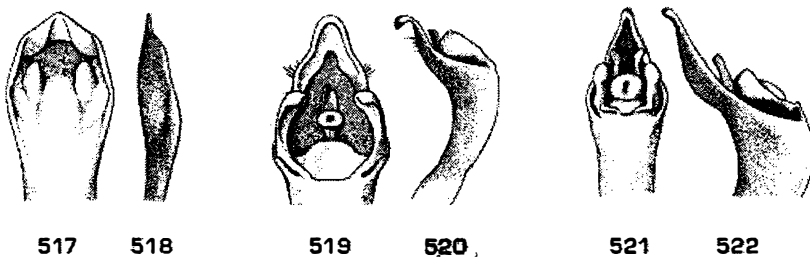
Figs 506-512 (after TOMOV 1982): 506, 507, 510, 511 - apical part of aedeagus in dorsal and lateral view; 508, 509, 512 - clypeus: 506-508 - *Lachnaia (Barathraea) cerealis*; 509 - *L. (B.) straminipennis*; 510-512 - *L. (B.) padillai*.

2. In male lateral angles of clypeus shorter and broader (fig. 509). Elytra covered with long and relatively abundant hairs. Apical part of flagellum forked. Length 7.0–10.0 mm (= ?*tripunctata* SCHNEIDER, 1792). Distributed in Morocco and Algeria ..... ***straminipennis*** (LUCAS, 1845).
- In male lateral angles of clypeus longer and narrower (fig. 516). Elytra sparsely covered with short hairs. Aedeagus not examined. Perhaps a form of *straminipennis* (thesis 2) ..... ***separata*** (PIC, 1897).



Figs 513-516 (after Tomov 1982). 513, 514 – apical part of aedeagus in dorsal and lateral view; 515, 516 – clypeus: 513-515 – *Lachnaia (Barathraea) octomaculata*; 516 – *L. (B.) separata*.

3. Apical part of aedeagus in lateral view strongly curved, apical part of flagellum forked (figs 296, 297). In male excavation of clypeus rather roundish (fig. 515). Aedeagus as in figs 261, 262. General view as in plate XII, phot. 100. Aedeagus as in figs 513, 514. Length 8.5–11.5 mm (= *octopunctata* PIC, 1897, *pardoii* COBOS, 1956). Variations: on each elytron four (2, 2) black spots (typical form), on each elytron three black spots (1, 2) (unnamed). Distributed in Morocco and Algeria ..... ***octomaculata*** (PIC, 1895).
- Apical part of aedeagus in lateral view not curved, flagellum not forked ..... 4.



Figs 517-522. Apical part of aedeagus in dorsal and lateral view (after PETITPIERRE 2000): 517, 518 – *Lachnaia (s. str.) puncticollis*; 519, 520 – *L. tristigma*; 521, 522 – *L. pseudeobarathraea*.

4. In male labrum with high semilunar ridge. Clypeus broadly excavated, lateral angles broad (fig. 508). Aedeagus as in figs 506, 507. Length 8.0–12.0 mm. Distributed in North-Africa, Israel and Syria ..... ***cerealis*** (OLIVIER, 1808).

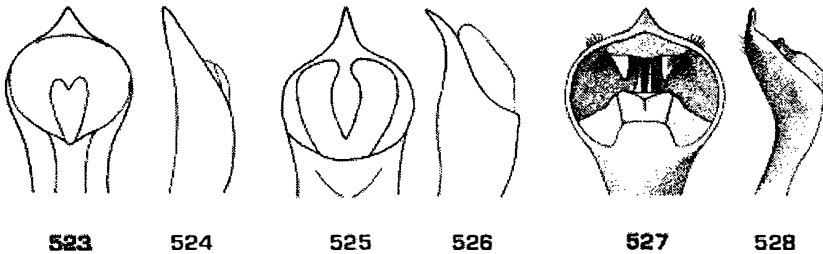
- In male labrum without semilunar ridge. Clypeus narrowly excavated (fig. 512). Aedeagus as in figs 510, 511. Length about 7.0 mm. Described from Tunisia .....  
 ..... ***padillai*** TOMOV, 1982.

Subgenus ***Lachnaia*** s. str.

Key to species

Not included: *Lachnaia rugicollis* NORMAND, 1937: 121, described from Tunisia based on two females only. Pronotum 3 times broader than long, length 8.0 mm. Incertae sedis (probably *Otiocephala*).

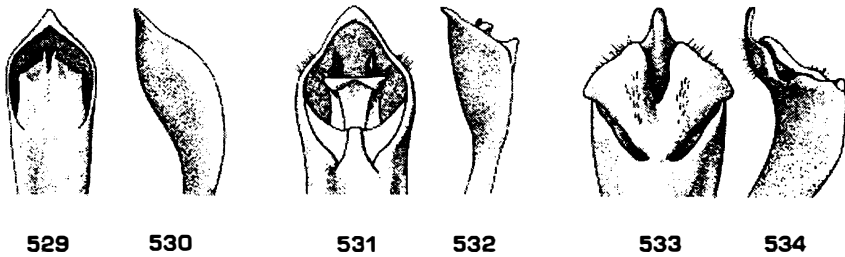
1. Head and pronotum black with (usually bluish) metallic lustre ..... 2.
- Head and pronotum black without metallic lustre ..... 6.
2. Pronotum nude. General view as in plate IX, phot. 79. Aedeagus as in figs 517, 518. Length 5.8–8.1 mm. Variations: pronotum black, without metallic lustre (ab. *curtipennis* PIC, 1936, see thesis 5), on elytron present humeral spot only (ab. *uniustigmata* PIC, 1898). Distributed in southern France, Iberian Peninsula, Morocco and Algeria ..... ***puncticollis*** CHEVROLAT, 1840.
- Pronotum with long hairs ..... 3.
3. Apex of aedeagus in lateral view crooked down ..... 4.
- Apex of aedeagus in lateral view very feebly curved or straight ..... 5.
4. Apex of aedeagus strongly crooked down. On elytra spots great, posterior spots often fused. Aedeagus as in figs 519, 520. Length 7.5–9.5 mm (= *triguttata* LACORDAIRE, 1848). Distributed in northern Africa, Iberian Peninsula, Italy and southern France ..... ***tristigma*** (LACORDAIRE, 1848).
- Apex of aedeagus slightly crooked down. On elytra black spots small, normally not joined. Aedeagus as in figs 521, 522. Length 7.0–8.5 mm (= *insidiosa* COBOS, 1954). Distributed in Sierra Nevada, sometimes considered as a local form of *tristigma* (thesis 4) ..... ***pseudobarathraea*** (DANIEL et DANIEL, 1898).
5. Length of body 7.0–9.0 mm. General view as in plate XII, phot. 102. Anterior tibiae straight. Along dorsal side of aedeagus run a deep furrow. Apex of aedeagus as in figs 533, 534. Occurs in Morocco ..... ***peyerimhoffi*** (KOCHER, 1953).



Figs 523-528. Apical part of aedeagus in dorsal and lateral view (527, 528 after PETITPIERRE 2000, remaining after WARCHAŁOWSKI 2003): 533, 524 – *Lachnaia* (s. str.) *peyerimhoffi*; 525, 526 – *L. lucidipennis*; 527, 528 – *L. variolosa*.



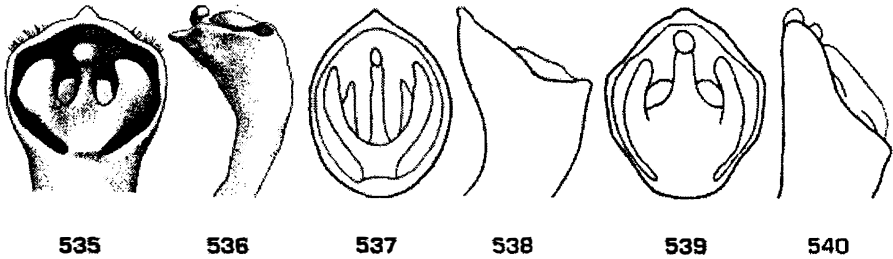
- Length of body 10.0–12.5 mm. Anterior tibiae a little curved outward. Dorsal side of aedeagus with a short impression only. Apex of aedeagus as in figs 525, 526. Occurs in Morocco ..... *lucidipennis* (PEYERIMHOFF, 1926).
- 6. Pronotum hairless. Here ab. *curtipennis* of *L. puncticollis* (see thesis 2).
- Pronotum with hairs ..... 7.
- 7. Elytra red, irregularly covered with numerous, black, punctate depressions. Intervals red, impunctate. General view as in plate XII, **phot. 103**. Aedeagus as in figs 527, 528. Length 7.0–11.0 mm (= *lentisci* FABRICIUS, 1792). Distributed in Algeria, Morocco and southern Spain ..... *variolosa* (LINNAEUS, 1767).
- Elytra normally punctate, red, yellow or yellow ochre, usually with three black spots (1, 2) ..... 8.



Figs 529-534. Apical part of aedeagus in dorsal and lateral view (after PETITPIERRE 2000): 529, 530 – *Lachnaia* (s. str.) *paradoxa*; 531, 532 – *L. cylindrica*; 533, 534 – *L. hirta*.

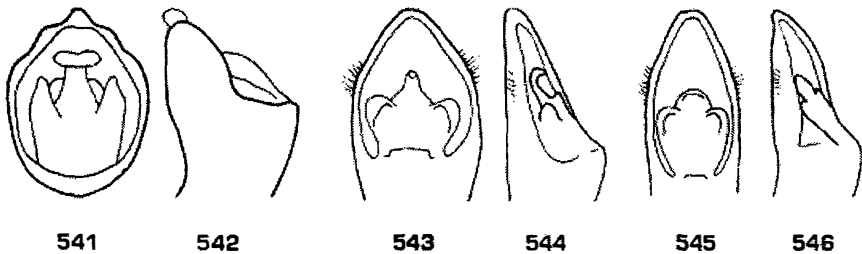
- 8. In male segment 1 of anterior tarsi much longer than 2+3. General view as in plate XII, **phot. 104**. Aedeagus as in figs 529, 530. Length 7.0–10.5 mm. Variations: elytron without black spots (typical form), humeral spot present only (ab. *kabyliana* PIC, 1912), inner posterior spot present only (ab. *bistigmata* PIC, 1912), both the spots present (ab. *jurjurenensis* PIC, 1913), all three spots present (ab. *vicina* LACORDAIRE, 1848). Perhaps here *L. fuchsi* PAPP, 1950, described from Algeria, with posterior part of elytra broadly black. Distributed in Algeria, Morocco and southern Spain ..... *paradoxa* (OLIVIER, 1808).
- In male segment 1 of anterior tarsi at the outside as long as 2+3 ..... 9.
- 9. In male segment 1 of anterior tarsi very short and relatively broad. General view as in plate XII, **phot. 105**. Aedeagus as in figs 531, 532, opercular lobi absent, central process long, bifurcate. Length 8.0–11.5 mm. Distributed in southern France, Iberian Peninsula, Algeria, Sicily and southern Italy ..... *cylindrica* (LACORDAIRE, 1848).
- In male segment of anterior tarsi elongate. Opercular lobi always present, central process never bifurcate ..... 10.
- 10. Pygidium very convex, strongly narrowed. In male mandibulae very broad, their lateral margins thickened and elevated. General view as in plate XII, **phot. 106**. Aedeagus as in figs 533, 534, opercular lobi great, strongly sclerotized, central process reduced, in dorsal view not visible. Length 8.5–12.0 mm (= *hirtipes* ALLARD,

- 1864, *suffriani* KRAATZ, 1872). Distributed in southern France, Iberian Peninsula, north-western Africa, Sicily and southern Italy ..... ***hirta*** (FABRICIUS, 1801)
- . Pygidium not very convex, in male mandibulae not enlarged, their lateral margins neither thickened nor elevated. Central process of operculum always visible, usually great ..... **11.**



Figs 535-540. Apical part of aedeagus in dorsal and lateral view (535, 536 after PETITPIERRE 2000, remaining after GRASSO 1958): 535, 536 – *Lachnaia* (s. str.) *pubescens*; 537, 538 – *L. caprai*; 539, 540 – *L. italica*.

11. In male third segment of anterior tarsi shallowly cut out, his lobi shorter than the basal part. Aedeagus as in figs **535, 536**. Opercular lobi narrow, central process long, very feebly thickened apically, strongly crooked backwards. Length 9.5–12.0 mm (= *macroductyla* LACORDAIRE, 1848, *palmata* LACORDAIRE, 1848). Variation: the black spots in hind part of elytra enlarged and fused (ab. *subfasciata* PIC, 1897). Distributed in southern France, Iberian Peninsula, north-western Africa, Corsica and Sardinia ..... ***pubescens*** (DUFOUR, 1820).
- . In male third segment of anterior tarsi deeply cut out, his lobi at least as long as the basal part ..... **12.**
12. Operculum very deeply cut out anteriorly, lobi long and narrow, claw-like, central process long ..... **13.**
- . Operculum not deeply cut out, central process shorter ..... **14.**



Figs 541-546. Apical part of aedeagus in dorsal and lateral view (541, 542 after GRASSO 1958, remaining after REGALIN 1997): 541, 542 – *Lachnaia* (s. str.) *sexpunctata*; 543, 544 – *L. orientalis*; 545, 546 – *L. zoi*.

13. Aedeagus as in figs **537, 538**. Central process long and narrow, not upturned. General view as in plate XII, **phot. 107**. Length 7.5–10.0 mm. Occurs in Sicily. Elytra very pale yellow ..... **caprai** (GRASSO 1958).  
 –. Aedeagus as in figs **539, 540**. Central process long, thickened at apex, strongly crooked backwards. Length 9.0–11.5 mm (= *sexpunctata* PETAGNA nec LINNAEUS, 1758). In Sardinia occurs a form with broader apex of central process (subsp. *occidentalis* GRASSO, 1963). Distributed in Italy, Sicily and Corsica, subsp. *occidentalis* in Sardinia only ..... **italica** (WEISE, 1882).
14. Aedeagus as in figs **541, 542**, operculum cut out, lobi distinctly separated. Central process broadened at apex and crooked backwards. General view as in plate XII, **phot. 108**. Length 8.5–11.0 mm (= *taurinensis* MÜLLER, 1766, *longipes* FABRICIUS, 1775, *brachialis* KÜSTER, 1844, *glabricollis* SUFFRIAN, 1851). Variations: elytra stronger punctate, four spots in posterior part of elytra form a straight row (ab. *pontica* WEISE, 1884). Distributed in north-eastern France (basin of Moselle), southern Germany, basin of Danube, Romania, Ukraine, Balkan Peninsula and Asia Minor ..... **sexpunctata** (SCOPOLI, 1763).  
 –. Operculum not cut out, lobi thickened but entirely joined with central process ... **15**.
15. Aedeagus as in figs **543, 544**, central process longer, his apex distinctly upturned. Length 8.5–10.5 mm. Distributed in northern part of Greece ..... **orientalis** (WEISE, 1882).  
 –. Aedeagus as in figs **545, 546**, central process short, at apex only a little thickened, not upturned. Length 8.5–10.5 mm. Distributed in southern Greece and in Crete ..... **zoiai** REGALIN, 1997.

### Genus *Macrolenes* CHEVROLAT, 1836

*Macrolenes janczyki* COBOS, 1956 from High Atlas does not belong here; this is a *Tituboea*, probably of *T. octopunctata*-group. *M. robusta* REINECK, 1911 described from Syria is synonymous with *Labidostomis testaceipes* PIC, 1904.

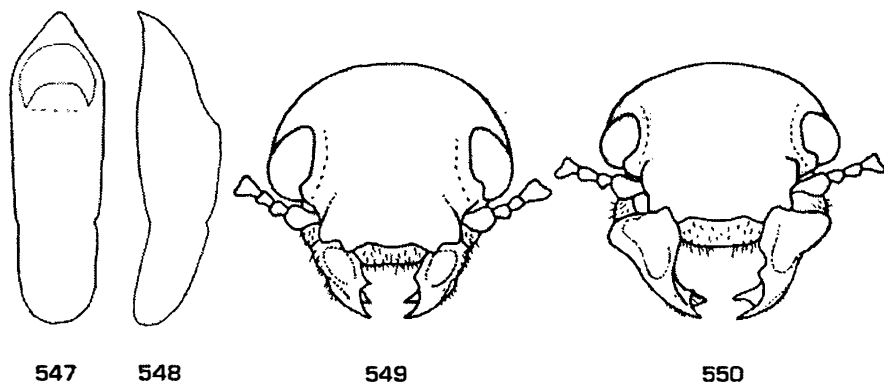
#### Key to species

1. Legs dorsally (mid and hind legs sometimes entirely) black. In male anterior femur with two distinct teeth. General view as in plate XIII, **phot. 109**. Aedeagus as in figs **547, 548**. Length 4.5–7.5 mm (= *crassimana* FORSBERG 1821, *zoufali* REITTER, 1918). Variations: elytron without black spots (ab. *immaculata* SCHULZ, 1909), humeral spot present only (ab. *gallica* SCHULZ, 1909), on each elytron two (1, 1) little spots (ab. *bimaculata* ROSSI, 1790), on each elytron two (1, 1) great spots (ab. *latemaculata* PIC, 1897), on each elytron three (2, 1) spots (ab. *salicariae* MÉNÉTRIÉS, 1826), on each elytron three (1, 2) spots (ab. *trimaculata* SCHULZ, 1909), on each elytron four (2, 2) spots (ab. *quadrimalculata* SCHULZ, 1909), all spots fused (ab. *confluens* WEISE, 1893). Distributed in all Mediterranean area fro, from Morocco and Iberian Peninsula to Central Anatolia, in Europe to S France, Alps and western part of Danube valley ..... **dentipes** (OLIVIER, 1808).  
 –. Legs yellow, knees and tarsi brown or blackish. In male anterior femur without teeth. Upper side dark yellow, front, occiput and scutellum black. On each elytron

usually one (humeral) spot, sometimes elytra entirely yellow or two (humeral and postmedian) brown spots present. Aedeagus as in *dentipes*. Described from Sicily and Algeria, possibly a form of *dentipes* ..... **bellieri** REICHE, 1860.

Genus **Melitonoma** CHEVROLAT, 1836

An Ethiopian genus, in discussed area one species only. Body entirely reddish yellow, on each elytron normally 5 black spots (1, 2, 2). Length 4.0–4.5 mm. Variation: external anterior spot absent (ab. *sefrensis* PIC, 1897). Described from Algeria, reported also from Tunisia ..... **saadensis** PIC, 1894.



Figs 547-550 (547, 548 after WARCHALOWSKI 2003; 549, 550 after COBOS 1957): 547, 548 – *Macrolenes dentipes*, aedeagus in dorsal and lateral view; 549, 550: mandibulae: 549 – *Otiocephala pardoii*; 550 – *O. opaca*.

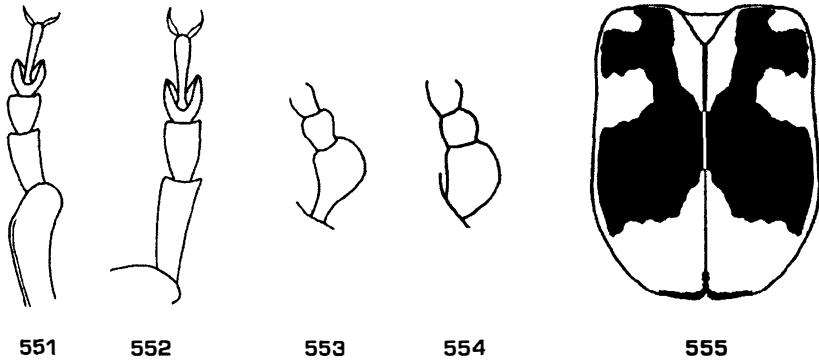
Genus **Otiocephala** LEFÈVRE, 1872

Literature: COBOS 1955a.

Key to species

1. Surface of elytra finely reticulated, opaque, without microsculptural punctures .... **2.**
- . Surface of elytra smooth and shining, without reticulation, sometimes with secondary microsculptural puncture ..... **11.**
2. In male mandibles strongly enlarged (fig. **549**) ..... **3.**
- . In male mandibles very feebly enlarged (fig. **550**) ..... **5.**
3. Frons impressed anteriorly. Elytron reddish with two spots anteriorly and a transverse stripe in posterior part (fig. **398**). Pronotum widest before its midlength. Length 6.5 mm. Described from Morocco, based on one specimen only. Female unknown ..... **pardoii** (COBOS, 1957).
- . Frons flat. Pronotum widest behind its midlength. Elytron with two transverse stripes, posterior stripe broader, extended to suture ..... **4.**

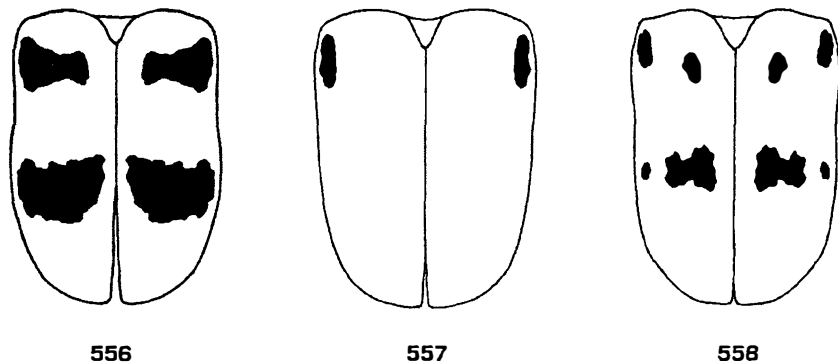
4. In male external margin of mandible nearly straight. Ground colour of elytra pale testaceous. Elytral pattern as in fig. 399. Length 5.8 mm. Described from Tunisia, based on one specimen only. Female unknown ..... *freyi* (COBOS, 1957).
- In male external margin of mandible strongly widened basally. Ground colour of elytra orange reddish, black patten as in *freyi* (thesis 4). Length 5.5 mm. Described from Morocco, based on two specimens (males) only. One specimen described as a subspecies: mandible at basis very broad, punctures on posterior part of elytron rugose (subsp. *obsoletesculpta* Cobos, 1957). Female unknown ..... *proxima* (COBOS, 1957).
5. Length of body 8.0–9.0 mm. Clypeus truncate. Ground colour of elytra vivid, orange reddish. On each elytron three little black spots: one postbasally and two in the middle of length, sometimes fused in a transverse stripe not reaching to suture (fig. 558). Distributed in Morocco ..... *rotroui* PIC, 1934.
- Length of body 7.0 mm not exceeding. Clypeus more or less arcuately emarginate ... ..... 6.



Figs 551-555 (after COBOS 1957): 551, 552 – fore tarsus of male: 551 – *Otiocephala antoinei*; 552 – *O. maroccana*. 553, 554 – basal antennomeres in male: 553 – *O. forcipifera*; 554 – *O. quadrinotata*; 555 – *O. antoinei*, elytral pattern.

6. Basal ridge of elytron long, reaching almost to scutellum .....7.
- Basal ridge of elytron short, reaching to the middle of anterior margin ..... 9.
7. In male first segment of anterior tarsus short (fig. 551). Pronotum irregularly and rather sparsely punctate. Elytral pattern as in fig. 555. Length 4.5–5.0 mm. Occurs in Morocco ..... *antoinei* (COBOS, 1957).
- In male first segment of anterior tarsus long (fig. 552). Pronotum regularly punctate ..... 8.
8. Pronotum widest in the middle of its length. Elytral pattern as in *tripolitana* (plate XIII, phot. 112). Length 6.0 mm (= ?*warioni* LEFEVRE, 1873). Described from Morocco, female unknown ..... *ornatissima* (ESCALERA, 1914).
- Pronotum widest before its basis. Elytral pattern as in *quadrinotata* (plate XIII, phot. 111). Length 5.5–6.7 mm. Distributed in Morocco ..... *maroccana* (COBOS, 1957).

9. In male tarsomeron 2 of anterior tarsus 1.5 × longer, in middle and posterior tarsus as long as 3. Ground colour of elytra pale fulvous ..... **10**.  
 - In male tarsomeron 2 of anterior tarsus as long as 3, in middle and posterior tarsus shorter than 3. Elytral pattern as in *quadrinotata* (plate XIII, **phot. 111**), but usually a little larger. Length 4.7–5.5 mm (= *andalusica* HEYDEN, 1870, *?lethierryi* CHEVROLAT, 1859, *?bisbipunctata* DESBROCHERS, 1870). Variations: elytral pattern extended (ab. *latecyanescens* PIC, 1946) or even fused together (ab. *rufolimbata* PIC, 1897), an additional little spot near scutellum (ab. *carnerii* PIC, 1920 described from Egypt). Distributed in S Spain and N Africa .....  
 ..... ***opaca*** (ROSENHAUER, 1856).



Figs 556-558. Elytral pattern (after COBOS 1957): 556 - *Otiocephala grossepunctata*; 557 - *O. kocheri*; 558 - *O. rottroui*.

10. Pronotum as broad as elytra. Elytral pattern in male as in plate XIII, **phot. 110**, in female additionally a great blackish spot in apical part of elytron. Length 4.6–5.5 mm. Distributed in Morocco ..... ***atlantica*** (COBOS, 1957).  
 - Pronotum narrower than elytra. On elytron one oblong humeral spot only (fig. 557). Length 6.0 mm. Described from Morocco, based on one specimen only. Female unknown ..... ***kocheri*** (COBOS, 1957).  
 11. First antennomeron at basis shaft-like elongated and narrowed (fig. 553). In male mandibles strongly enlarged ..... **12**.  
 - First antennomeron formed normally (fig. 554). In male mandibles not enlarged ..... **13**.  
 12. In male mandibles dorsally with great spoon-like depression. Length 5.1–6.6 mm. Elytral pattern as in plate XIII, **phot. 111**. Distributed in Morocco and Algeria ..... ***forcipifera*** (LUCAS, 1845).  
 - In male mandibles dorsally convex. Elytral pattern as in plate XIII, **phot. 113**. Length 5.0–6.0 mm. Described from Libya. Female unknown ..... ***tripolitana*** (COBOS, 1957).  
 13. On each elytron two short transverse stripes (fig. 556). Punctures of pronotum very strong, dense and deep. Length 5.5 mm. Described from Morocco, based on two males only. Female unknown ..... ***grossepunctata*** (COBOS, 1957).

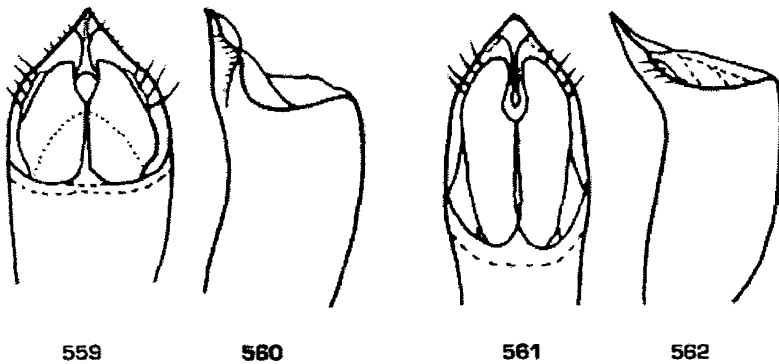
- On each elytron a roundish humeral dot and a great subrectangular spot in posterior part plate XIII, **phot. 112**). Punctures of pronotum not particularly strong and deep. Length 4.9–5.7 mm. In High Atlas forms a subspecies with lateral groove of left mandible in male considerably broader and deeper (subsp. *atlasica* COBOS, 1957). Distributed in Morocco and Algeria ..... ***quadrinotata*** (FABRICIUS, 1787).

Genus ***Otiotraea*** WARCHAŁOWSKI, 1990

Literature: VELA and BASTAZO 1993.

Key to species

- 1. Upper side black without metallic lustre, with yellow pattern. On pronotum two lateral and one central spot ..... **2**.
- Upper side with bluish metallic lustre, elytra unicolorous ..... **3**.
- 2. On each elytron four (subhumeral, scutellar, premedian and apical) spots. General view as in plate XIII, **phot. 114**. Length 5.0 mm. Described from Algeria ..... ***ghardaiensis*** WARCHAŁOWSKI, 1990.
- On each elytron only apical spot, margins of apical part black. Antennomeres 1–3 orange. Length 4.0 mm. Described from Morocco ..... ***rotroui*** (KOCHER, 1960).
- 3. Pronotum orange with a great central black spot. General view as in plate XIII, **phot. 115**. Length 3.8–4.4 mm. Distributed in east-southern Spain ..... ***avilai*** VELA et BASTAZO, 1993.
- Upper side unicolorous. Length 3.6–3.8 mm. Distributed in east-southern Spain ..... ***flabrensis*** (COBOS, 1957).



Figs 559-562. Tubular part of aedeagus in dorsal and lateral view (after MEDVEDEV 1996): 559, 560 – *Paraclytra signata*; 561, 562 – *P. crocata*.

Genus ***Paraclytra*** MEDVEDEV, 1971

In the discussed area two species.

## Key to species

1. Elytra usually with humeral and postscutallar spots and a transverse stripe in hind part. Aedeagus broader than in *crocata*. Aedeagus as in figs 559, 560. Length 6.5–8.5 mm. Distributed in Palaeotropical part of Africa and in Arabian Peninsula. Nominotypical subspecies does not occur in discussed area, subspecies *sennariensis* LACORDAIRE, 1848 (= *rufitarsis* LACORDAIRE, 1848), known from Saudi Arabia ..... *signata* (LACORDAIRE, 1848).
- . Elytra usually with transverse preapical stripe only, often also with shorter premedian stripe. General view as in plate XIII, phot. 116. Aedeagus (figs 561, 562) narrower. Length 7.0–8.5 mm. Variation: pronotum black (ab. *melanaria* MEDVEDEV, 1996). Described from Saudi Arabia ..... *crocata* (LACORDAIRE, 1848).

## Genus *Physosmaragdina* MEDVEDEV, 1971

In discussed area one species only. Pronotum, ground of elytra, scutellum and proximal part of tibiae yellowish. Head, antennomeres 3–11, remaining part of legs and underside black. Elytra usually with black pattern. General view as in plate XIII, phot. 117. Length 4.8–5.5 mm (= *japonica* BALY, 1873, *coreana* KOLBE, 1886, *kiotoensis* PIC, 1927, *atripes* PIC, 1927, *submarginata* PIC, 1927, *kolthoffi*, PIC, 1938). Variations: median yellow band on elytra very narrow (ab. *mandarina* WEISE, 1889). On elytron basal black band divided (ab. *basidisjuncta* PIC, 1932), on elytron black bands shortened (ab. *latereducta* PIC 1932), on elytra basal black band present only, remaining black pattern disappear (ab. *atrobasalis* PIC, 1932), elytra entirely pale (ab. *immaculata* HEYDEN, 1887). From Taiwan is described a larger form (length 5.5–7.0 mm) with abdominal sternites yellowish basally, perhaps a distinct subspecies (ab. *formosana* CHŪJŌ, 1934). Rather broadly distributed in E Asia, from Korea and Japan to Central China, Taiwan and Vietnam .... *nigrifrons* (HOPE, 1842).

## Genus *Smaragdina* CHEVROLAT, 1836

*Cyaniris* CHEVROLAT, 1836, nec DALMAN, 1816 (*Lepidoptera*).

## Key to subgenera

1. Hind angles of pronotum slightly but distinctly elevated. Body parallel, slender and small, usually under 3.5 mm. Two asiatic species only ..... *Nanosmaragdina* (p. 127).
- . Hind angles of pronotum not elevated ..... 2.
2. Genae longer than half longer eye diameter. Pronotum unicolorous, blackish-green or bluish-black, at least laterally rather strongly punctate, its metallic lustre usually vivid. Sexual dimorphism in structure of head and legs sometimes very distinct (= *Calyptorhina* LACORDAIRE, 1848) ..... *Smaragdina* s. str. (p. 127).
- . Genae much shorter than half longer eye diameter. Pronotum unicolorous or bicolorous, finely punctate, its metallic lustre, if present, never vivid. Sexual dimorphism in structure of head and legs very feeble or absent (= *Gynandrophthalma* LACORDAIRE, 1848) ..... *Monrosia* (p. 119).



Key to auxiliary groups

1. Elytra bicolorous ..... auxiliary **group A** (p. 119).
- Elytra unicolorous ..... **2**.
2. Pronotum unicolorous ..... auxiliary **group B** (p. 120).
- Pronotum bicolorous ..... auxiliary **group C** (p. 124).

Auxiliary group **A**

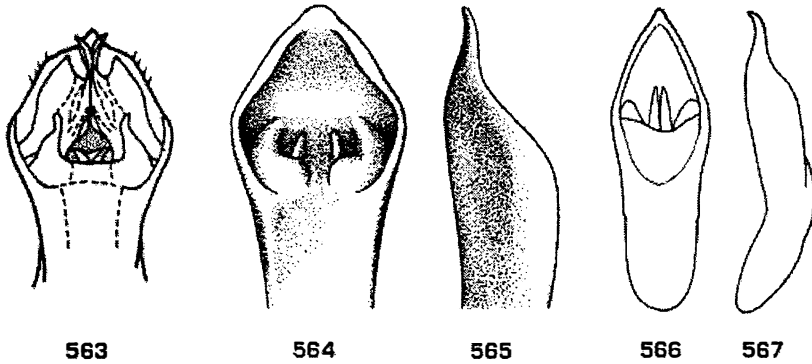
Elytra bicolorous.

Key to species

1. Pronotum black. Elytra pale with two black spots (humeral and postmedian), underside black. Length 5.0 mm. Described from ?Egypt. Probably a mistake; supposedly an oriental species ..... *atricollis* (PIC, 1922).
- Pronotum pale or bicolorous, pale with blackish marking ..... **2**.
2. Pronotum pale. Species from N Africa and Arabian Peninsula ..... **3**.
- Pronotum bicolorous, pale with black marking. Asiatic species ..... **5**.
3. Upper side pale (reddish or yellow) ..... **4**.
- Elytra dark green with yellowish spot on apex. Length 3.5 mm. Described from Morocco, based on one female only ..... *bechynei* (COBOS, 1956).
4. On each elyteron a great black spot. Underside and legs black, fore femora and tibiae on the inner side reddish. Length about 4.0 mm (= *picturata* NORMAND, 1949, nec JACOBY, 1901). Described from Tunisia, based on one female only; perhaps a colour variation of *pallescens* (auxiliary group B, thesis 2) ..... *tunisea* WARCHAŁOWSKI, 2000.
- On each elytron transverse or oblique black-greenish bands in basal and in hind part. Basal band often reduced to humeral spot only, divided into two spots or disappearing, hind band sometimes divided into two spots. Aedeagus as in fig. **563**. Length 4.8–5.8 mm. Described from Saudi Arabia ..... *saudica* MEDVEDEV, 1993.
5. Pronotum with central marking only ..... **6**.
- Pronotum with central marking and two lateral spots blackish. Forms two subspecies: elytra bluish-black with pale lateral and apical margins (subsp. *dzhungarica* MEDVEDEV, 1980 from Mongolia), elytra pale with 7 large black-blue or black-green spots (nominotypical subspecies from Central Asia). General view as in plate XIV, **phot. 118**. Length 4.3–5.8 mm (= *fischeri*, HEYDEN, 1881, *hilaris* KRAATZ, 1879, *undecimnotata* WEISE, 1892). Distributed in Kirgisia, Altai, W China and Mongolia ..... *thoracica* (FISCHER, 1842).
6. Larger. Central black marking on pronotum reduced to a short spot in hind part. Elytra black with very weak bluish reflex, anterior part dark yellow with a large black humeral spot, apical part also yellow, lateroapical margin black. Sometimes black colour reduced to humeral spot and an arched stripe in the middle. In some specimens yellow marking of elytra reduced to apical zone only. General view as in

plate XIV, **phot. 119**. Length about 6.0 mm. Variation: larger (8.0 mm), on elytra pale colour strongly expanded (ab. *dauidis* LEFÈVRE, 1893, perhaps not conspecific). Typical form distributed in NW China (Kansu) .... ***peplopteroides*** (WEISE, 1889).

- Smaller. Central black marking on pronotum forms a broad median stripe reaching to anterior margin ..... 7.



Figs 563-567. Aedeagus in dorsal and lateral view (563 after MEDVEDEV 1996; 564, 565 after PETITPIERRE 2000; 566, 567 after WARCHALOWSKI 1991): 563 - *Smaragdina* (*Monrosia*) *saudica*; 564, 565 - *S. (M.) cobosi*; 566, 567 - *S. (M.) tibialis*.

- 7. Elytra bluish-black with pale apical area. General view as in plate XIV, **phot. 120**. Length 4.0-5.4 mm (= *lateralis* GEBLER, 1848). Distributed in W China, Altai and Mongolia. Populations from W Siberia and NO Kazakhstan known as (? subsp.) *lateralis* GEBLER ..... ***collaris*** (FABRICIUS, 1781).
- Elytra pale with dark brown pattern. Length 4.7 mm. Described from N China ....  
..... ***boreosinica*** GRESSIT et KIMOTO, 1961.

### Auxiliary group B

Elytra unicolorous, pronotum unicolorous.

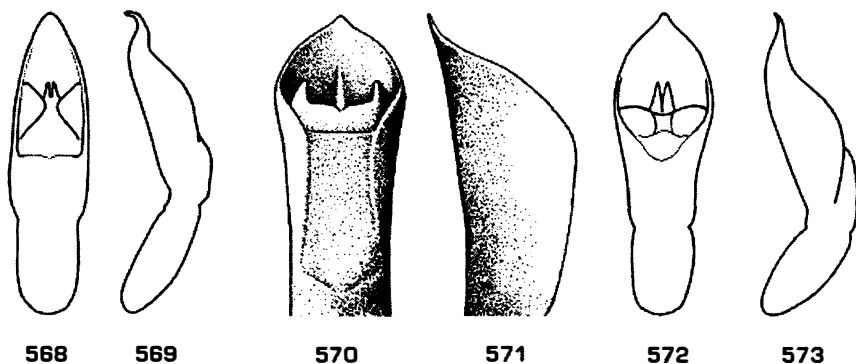
#### Key to species

- 1. Elytra uniformly pale ..... 2.
- Elytra entirely black or black with metallic reflex ..... 3.
- 2. Head, abdomen, meso- and metathorax blackish, remaining parts of body yellowish or yellowish testaceous. Length 4.0-5.0 mm. Described from N Algeria .....  
..... ***pallescens*** (PIC, 1895).
- Body testaceous to pale reddish brown. Antennomeres 3-11 or 4-11 dark brown, tibiae in apical part and tarsi darkened or blackish. General view as in plate XIV, **phot. 121**. Length 5.4-6.2 mm. Distributed in E China (Chekiang), Japan (Honshu, Shikoku, Kyushu), Ryukyu Isl. and Taiwan ..... ***nipponensis*** (CHŪJŌ, 1951).

3. Pronotum black or black with metallic reflex ..... **4**  
 - Pronotum uniformly pale ..... **7**  
 4. E Asiatic species ..... **5**  
 - European and Mediterranean species ..... **6**  
 5. Elytra strongly and deeply punctate, interstices convex, smooth. Pronotum with transverse impression in anterior part. Legs dark brown, fore tibiae paler, usually rusty-red. General view as in plate XIV, **phot. 122**. Length 3.6–5.0 mm (= *compressipennis* PIC, 1927, *obscuricolor* PIC, 1927). Distributed in E Siberia and N China ..... **obscuripes** WEISE, 1887.  
 - Elytra finely and more shallowly punctate, interstices flat, minutely punctulate. Pronotum with a weak impression basally, its lateral margins (or fore angles only) indistinctly paler. Dark forms of *aurita nigrocyanea* (auxiliary group C, thesis 12).  
 6. Body slender. Length of elytron about three times greater than breadth General view as in plate XIV, **phot. 123**. Aedeagus as in figs **564, 565**. Length of body 3.3–5.0 mm. Iberian species, distributed in mountains of Andalusia (Sierra Nevada, Serrania de Ronda) ..... **cobosi** (CODINA, 1963).  
 - Body not slender. Length of elytron about 2.5 times greater than his breadth. Fore legs pale, mid and hind femora blackish. General view as in plate XIV, **phot. 124**. Aedeagus as in figs **566, 567**. Length of body 2.9–4.2 mm. Variations<sup>4</sup>: pronotum entirely black (typical form), on pronotum two pale spots behind anterior angles (ab. *bioculata* LACORDAIRE, 1848), on pronotum anterior angles reddish (ab. *liturata* WEISE, 1882), length of body about 4.5 mm, all femora yellow (ab. *hellenica* MARSEUL, 1869). Distributed in the Balkans, Asia Minor and Syria. In Israel occurs sub-species *flavipes* MEDVEDEV, 1992, with entirely fulvous legs ..... **tibialis** (BRULLÉ, 1832).  
 7. Species from C and E Asia ..... **8**  
 - Mediterranean and European species ..... **13**  
 8. Legs entirely pale ..... **9**  
 - Coxae and basal part of femora black ..... **12**  
 9. Head and scutellum yellowish. Length 4.0–5.0 mm. Distributed in S Kazakhstan ..... **discolor** s. str. (SOLSKY, 1882).  
 - Scutellum and at least frons and vertex black ..... **10**  
 10. Clypeus orange yellow. Length 4.0–5.0 mm. Distributed in SE Kazakhstan and Kirgisia. Perhaps here *moutoni* (PIC, 1892) described from SW China and *semiviridis* (PIC, 1922), described from Tibet ..... **discolor rufilabris** (WEISE, 1887).  
 - Clypeus black ..... **11**  
 11. Labrum yellowish, antennae entirely pale or in apical part brownish. General view as in plate XIV, **phot. 125**. Larger, length 5.0–6.4 mm (= *japonica* FLEISCHER, 1916, *garretai* ACHARD, 1921, *fleischeri* PAPP, 1946). Distributed in E Siberia, N China, Korea and Japan ..... **semiauranthiaca** (FAIRMAIRE, 1888).  
 - Labrum piceous, antenna in apical half dark. Pronotum usually with a small, brownish, blurred spot before scutellum. Smaller, length 4.9–5.4 mm. Distributed in basin of Amur and NO China ..... **potanini** MEDVEDEV, 1970.  
 12. Elytra strongly, deeply and densely punctate, interstices on average narrower than diameter of punctures (= *ignorata* LOPATIN, 1954). Remaining characters as

<sup>4</sup> ab. *hungarica* WEISE, 1895 from Hungary was described based on a misidentified specimen.

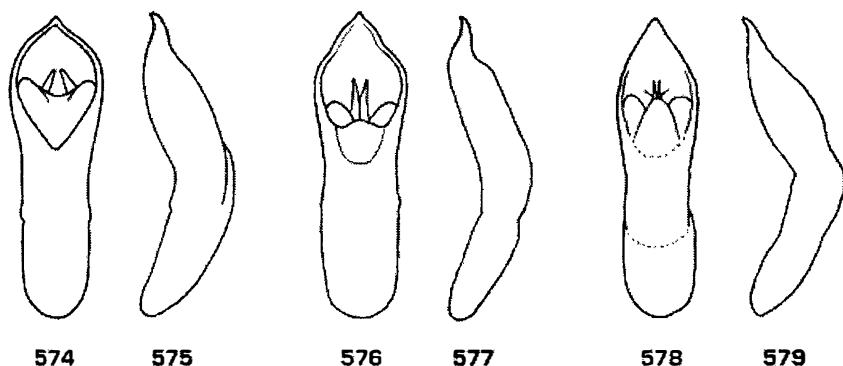
- in *discolor rufilabris* (thesis 10). Distributed in SE Kazakhstan, Tadzhi-kistan, Uzbekistan and Kirgisia ..... ***discolor viridiceps*** (WEISE, 1892).
- Elytra less strongly and densely punctate, interstices on average as broad as diameter of punctures. On average larger, length 5.0–6.2 mm ..... **13.**
  - 13. Legs entirely pale ..... **14.**
  - At least hind and mid femora in basal part black ..... **17.**
  - 14. Labrum and mandibulae black ..... **15.**
  - Labrum and mandibulae yellow or only insignificantly darkened ..... **16.**
  - 15. E Mediterranean species. Body not elongate. Length of elytron less than three times greater than breadth. Described from northern Turkey. Length 4.0–5.0 mm. Possibly identical with *vaulogeri* (auxiliary group C, thesis 5) ..... ***amasina*** (PIC, 1897).
  - W Mediterranean species. Body rather elongate. Perhaps a colour form of *algorica* (antithesis 16) ..... ***apicitarsis*** (FAIRMAIRE, 1876).
  - 16. Elytra strongly, very densely punctate, interstices smaller than diameter of punctures. Body cylindrical, elongate. General view as in plate XIV, **phot. 126**. Length 4.0–5.0 mm. Distributed in Sardinia and Corsica ..... ***ferulae*** (GENÉ, 1839).
  - Elytra strongly punctate, interstices approximately as broad as diameter of punctures. Length 3.7–4.6 mm. Known from Algeria, reported also from Morocco ..... ***algorica*** (WEISE, 1894).
  - 17. Pronotum sparsely and irregularly, but distinctly punctate ..... **18.**
  - Pronotum, at least in his central part, impunctate ..... **20.**



Figs 568–573. Aedeagus in dorsal and lateral view (570, 571 after PETITPIERRE 2000, remaining after WARCHAŁOWSKI 2003): 568, 569 – *Smaragdina (Monrosia) graeca*; 564, 565 – *S. (M.) rufimana*; 566, 567 – *S. (M.) diversipes*.

- 18. Eastern-mediterranean species. Tibiae always entirely yellow General view as in plate XV, **phot. 127**. In male pronotum bicolorous, with a great median black stripe, in female entirely reddish yellow. Aedeagus as in figs **576, 577**. Length 3.7–4.5 mm (= *graeca* LEFÈVRE, 1872 nec KRAATZ, 1872, *brucki* PIC, 1897). Distributed in southern part of Balkan Peninsula ..... ***graeca*** (KRAATZ, 1872) (female).
- Western-mediterranean species ..... **19.**

19. Hind angles of pronotum weakly, but perceptibly elevate. Mid and hind tibiae often darkened, sometimes brown or blackish. General view as in plate XV, **phot. 128**. Length 3.9–5.0 mm. Here females of *Chilotomina oberthuri* (ibidem, thesis 5), often determined as *S. rufimana* (thesis 21).
- . Hind angles of pronotum not elevate, all tibiae pale. Length 4.0–4.5 mm. Distributed in Iberian Peninsula ..... **clavareau** (JACOBSON, 1906).
20. Mid and hind legs darkened ..... **21**.
- . Femora in basal part and sometimes last tarsomeron darkened, remaining parts of legs yellowish ..... **22**.



Figs 574-579. Aedeagus in dorsal and lateral view (578, 579 after WARCHAŁOWSKI 1993, remaining after WARCHAŁOWSKI 1991): 574, 575 – *Smaragdina (Monrosia) salicina*; 576, 577 – *S. (M.) graeca*; 578, 579 – *S. (M.) vaulogeri*.

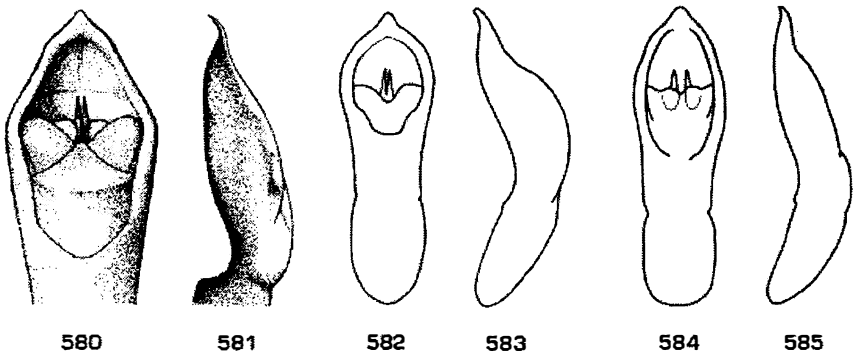
21. Mid and hind legs dark brown or black, fore legs yellowish, sometimes with darker external edge of tibia. On pronotum a great, brownish, blurred stain. Aedeagus as in figs **564, 565**. Length 3.8–4.8 mm (= ?*marocana* PIC, 1936). Distributed in Morocco and Algeria, probably conspecific with *Chilotomina erberi* (ibidem, thesis 2) ..... **rufimana** LACORDAIRE, 1848.
- . Mid and hind legs brownish, not black. Pronotum without stains. Aedeagus as in figs **374, 375**. Length 3.6–5.2 mm. Distributed in European mountains (Pyrenees, Alps, Sudetes), reported also from Transsylvania (perhaps here the doubtful species *transsylvanica* FRIVALDSZKY, 1883, usually considered as synonymous with *salicina*, thesis 22) ..... **diversipes** LETZNER, 1839.
22. Elytra strongly punctate, legs robust. General view as in plate XV, **phot. 129**. Aedeagus as in fig. **574, 575**. Length 5.5–7.5 mm (= *cyanea* FABRICIUS, 1775). Distributed in central and southern Europe from northern Spain and Danmark to basin of Volga and Caucasian countries. Here perhaps also unclear species *laeviceps* ABELLE, 1995 described from Syria ..... **salicina** (SCOPOLI, 1763).
- . Elytra moderately punctate, legs slender. Length 3.5–5.5 mm. Variation: pronotum with a few dark spots (ab. *picticollis* WEISE, 1889). Distributed in Europe from France and northern Italy to Ukraine, northern Turkey and Caucasian countries, recorded also in Lithuania and in southern Finland ..... **flavicollis** CHARPENTIER, 1825.

## Auxiliary group C

Pronotum bicolorous, elytra black or black with metallic reflex.

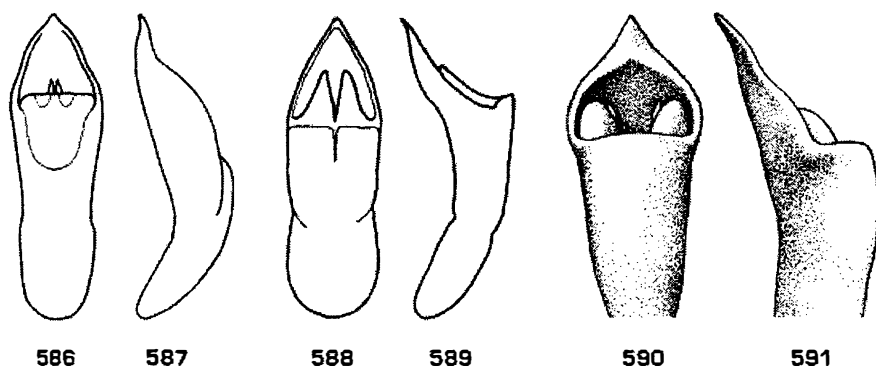
### Key to species

1. Ground colour of pronotum black, pale lateral pattern small or blurred ..... 2.
- Ground colour of pronotum yellowish or reddish with dark pattern, mostly in form of a black median longitudinal stripe ..... 3.
2. Pronotum black with anterior angles or with a spot behind anterior angles pale. Forms of *tibialis* (auxiliary group B, antithesis 6).
- Pronotum black with indistinctly paler lateral margins. Dark form of E Palaearctic *aurita nigrocyanea* (thesis 12).
3. Species from Europe and Mediterranean area ..... 4.
- Species from Central and E Asia ..... 15.
4. Pronotum with a blurred stain ..... 5.
- Pronotum with a few dark spots or with a black longitudinal, well-delimited median stripe ..... 6.
5. Mid and hind legs dark brown or blackish. See *S. rufimana* (auxiliary group B, thesis 21).
- In mid and hind legs only femora in part blackish, sometimes also third and fourth tarsomera darkened, but tibia always entirely yellow. Aedeagus as in figs 578, 579. Length 3.6–4.6 mm (= *uyguni* WARCHAŁOWSKI, 1993). Distributed in Asia Minor and Syria ..... *vaulozeri* (PIC, 1894) (female).
6. Pronotum with a few little dark spots ..... 7.
- Pronotum with a broad, black, longitudinal stripe ..... 8.
7. Legs yellow, sometimes basis of hind femora brownish. Here *S. flavicollis* ab. *picticollis* (auxiliary group B, antithesis 22).
- Hind femora at least in basal part black. Here variations of *S. vaulozeri* (see thesis 5).



Figs 580-585. Aedeagus in dorsal and lateral view (580, 581 after PETITPIERRE 2000, remaining after WARCHAŁOWSKI 1991): 580, 581 – *Smaragdina (Monrosia) reyi*; 582, 583 – *S. (M.) xanthaspis*; 584, 585 – *S. (M.) aurita*.

8. Mid and hind legs brown or black ..... **9**.  
 - Mid and hind legs yellow, sometimes mit (partly) blackened femora ..... **10**.  
 9. Median stripe on pronotum posteriorly strongly widened. Pronotum strongly punctured. Aedeagus as in figs **580**, **581**. Length 4.2–5.5 mm. Variation: mid and hind legs brownish, not black (ab. *lucidipes* PIC, 1897). Distributed in Iberian Peninsula ..... **reji** (BRISOUT, 1866).  
 - Median stripe on pronotum not widened. Pronotum moderately strongly or rather finely punctured. Length 4.0–5.5 mm. Here *affinis* subsp. *manicata* (see anti-thesis 14), occurring in Spain, probably a distinct species.  
 10. Median stripe on pronotum strongly narrowed ahead General view as in plate XV, **phot. 130**. Aedeagus as in (figs **582**, **583**) Length 5.5–7.5 mm (= ?*bicoloripes* PIC 1922). Distributed in northern Italy, northern part of Balkan Peninsula, basin of Danube, southern Ukraine and in Asia Minor ..... **xanthaspis** (GERMAR, 1824).  
 - Median stripe on pronotum not strongly narrowed ahead ..... **11**.  
 11. Hind femora at least in the basal 1/2 black ..... **12**.  
 - Hind femora entirely yellow or in basal 1/4 brownish. Mandibulae yellow ..... **14**.  
 12. Pronotum in central part impunctate. General view as in plate XV, **phot. 131**. Aedeagus as in figs **584**, **585**. Length 5.2–7.0 mm (= *bicolor* GRIMMER, 1841, *alpigena* GISTEL, 1857, ?*auritoides* ACHARD, 1922). Distributed in Pyrenees, western France, Italy and central Europe, reported also from Caucasian countries. In E Palaeartic forms two subspecies: larger (4.7–6.2 mm) with legs, labrum and mandibulae yellowish (subsp. *nigrocyanea* MOSCHULSKY, 1866, = *geniculata* MOTSCHULSKY, 1866, distributed in E Siberia) and smaller (3.5–4.8 mm) often with darkened legs, labrum and mandibulae black (subsp. *hammarstroemi* JACOBSON, 1901 from basin of Amur and N China) ..... **aurita** (LINNAEUS, 1767).  
 - Central part of pronotum punctate. Length of body 3.6–4.6 mm ..... **13**.  
 13. Pronotum rather strongly punctate. *S. graeca* (male), see auxiliary group B, thesis 18.  
 - Pronotum finely punctate. *S. vaulogeri* (male), see thesis 5.



Figs 586-591. Aedeagus in dorsal and lateral view (590, 591 after PETITPIERRE 2000, remaining after WARCHALOWSKI 1991): 586, 587 – *Smaragdina* (*Monrosia*) *affinis*; 588, 589 – *S. (Smaragdina) chloris*; 590, 591 – *S. (S.) concolor*.

14. Black stripe on pronotum broadened in the middle, diamond-shaped. Legs robust. General view as in plate XV, **phot. 132**. Length 4.0–5.0 mm (= *berchmansii* REITTER, 1911). Distributed in Asia Minor, Israel and Syria ..... ***judaista*** (LEFÈVRE, 1872).
- . Black stripe on pronotum broadened in the middle, not diamond-shaped. Legs slender. General view as in plate XV, **phot. 133**. Aedeagus as in (fig. 586, 587). Length 4.0–4.7 mm (= *noesskei* SCHATZMAYR, 1928). Distributed in England, France, Italy, central Europe, Bulgaria, Romania and southern Ukraine, reported also from Finland. In Iberian Peninsula represented by subsp. *manicata* LACORDAIRE, 1848 (mandibulae blackish, mid and hind legs darkened or black, see antithesis 9) ..... ***affinis*** (ILLIGER, 1794).
15. Black stripe on pronotum with metallic sheen, narrowed posteriad and sharpened anteriad, diamond-shaped. Legs entirely pale, hind femora sometimes darkened at base. Forms two subspecies: larger (5.0–5.7 mm), head and elytra metallic green, pronotum finely, but distinctly punctate (nominotypical subspecies), smaller (3.5–5.0 mm), head and elytra metallic blue, puncturation of pronotum extremely fine, barely perceptible (subsp. *sahlbergi* JACOBSON, 1901 (= *discithorax* PIC, 1902, *discalis* CHÛJÔ, 1941, *coreana* CHÛJÔ, 1936 nec KOLBE, 1886). Nominotypical subspecies described from N China (Kansu), subsp. *sahlbergi* distributed in Mongolia, E Siberia, N China (Heilungkiang) and Korea ..... ***labilis*** WEISE, 1889.
16. Central stripe on pronotum very broad. Upperside bluish-green. Legs darkened, reddish brown, hind femora at least basally dark brown. Frons partly pale. Length about 5.0 mm. Perhaps a dark form of *labilis* s. str. (antithesis 15). Described from China ..... ***viridipennis*** PIC, 1937.
- . Central stripe on pronotum not particularly broad ..... **17**.
17. Central stripe on pronotum in anterior part relatively narrow, broadened basally. Clypeus black. Central part of pronotum minutely and sparsely but distinctly punctate. Legs pale. General view as in plate XV, **phot. 134**. Length 4.5–5.7 mm. Distributed in Tibet ..... ***flavilabris*** (BREIT, 1917).
- . Central stripe on pronotum differently formed ..... **18**.
18. Elytra strongly, deeply and densely punctate, pronotum moderately strongly but deeply, rather densely and distinctly punctate. Legs robust, pale. Length 5.0–6.5 mm. Distributed in S Kazakhstan and Kirgisia ..... ***punctatissima*** (WEISE, 1892).
- . Elytra moderately strongly or finely punctate, pronotum finely punctate or smooth ... .. **19**.
19. On pronotum central stripe pure black, parallel, impunctate, smooth and shining ... .. **20**.
- . On pronotum central stripe finely, sparsely and irregularly but distinctly punctate, with bluish metallic reflex. Hind and mid femora at least partly blackened. General view as in plate XV, **phot. 135**. Length 4.0–5.0 mm. Distributed in E Uzbekistan, S Kazakhstan and Kirgisia ..... ***stenroosi*** (JACOBSON, 1901).
20. Length of body 3.5–4.4 mm. Clypeus and anterior margin of frons yellow. Legs entirely yellow. Distributed in China (Sichuan, Kansu) ..... ***flavifrons*** GRESSIT et KIMOTO, 1961.
- . Length of body on average larger, 4.0–6.2 mm. Clypeus and anterior margin of frons black. E Palearctic subspecies of *aurita* (thesis 12).



Subgenus *Nanosmaragdina* LOPATIN et KULENOVA, 1984

= *Smaragdina* MEDVEDEV, 1971, nec ADAMS, 1848 (*Mollusca*).

Key to species

1. Upperside entirely bluish black. General view as in plate XVI, **phot. 136**. Length 2.9–3.6 mm. Distributed in E Uzbekistan, S Kazakhstan, Kirgisia and Tadzhikistan ..... **macilenta** (WEISE, 1887).
- . Pronotum entirely pale ..... **2**.
2. Elytra entirely bluish black. General view as in plate XVI, **phot. 137**. Length 2.8–3.3 mm. Described from Syria ..... **djebellina** (LEFÈVRE, 1872).
- . Elytra pale, each elytron with two large black spots: roundish (on anterior half) and oblique (on apical half). Length 3.5 mm. Described from Afghanistan, based on one male only ..... **minutissima** (LOPATIN, 1967).

Subgenus *Smaragdina* s. str.

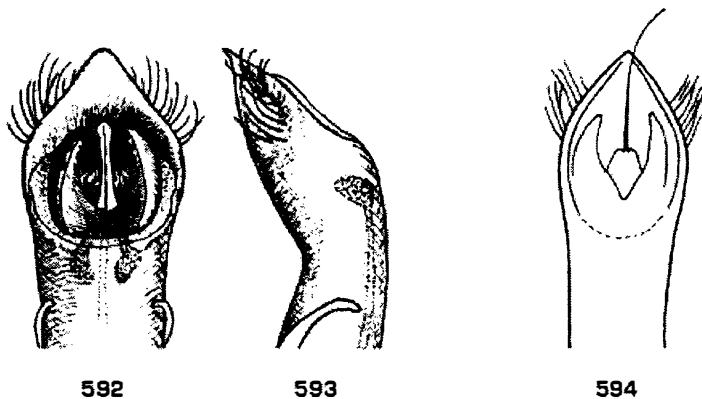
Literature: COBOS 1955b, ERBER and MEDVEDEV 1999.

*Calyptorhina* LACORDAIRE, 1848.

Key to species

1. In fore legs first tarsomere about as long as two following together ..... **2**.
- . In fore legs first tarsomere much shorter than two following together ..... **5**.
2. Antennomeres 6–9 broader than long ..... **3**.
- . Antennomeres 6–9 at most as broad as long. Remaining external characters as in *chloris* s. str. (thesis 3) ..... **4**.
3. Elytra entirely metallic, without yellow or orange pattern. Length 4.5–6.0 mm. Forms two subspecies: anterior margin of clypeus in male straight, outline of body broader (nominotypical subspecies), anterior margin of clypeus in male slightly but distinctly emarginate (subsp. *caucasica* MEDVEDEV, 1971). General view as in plate XVI, **phot. 138**. Aedeagus as in figs **588**, **589**. Distributed in Bulgaria, Greece, W Turkey (nominotypical subspecies) and in NW Caucasus (subsp. *caucasica*) ..... **chloris** (LACORDAIRE, 1848).
- . Elytra metallic green or blue, with roundish dark yellow spot on apical part. Forms two subspecies: body larger, in male about 6.0–6.5 mm, (nominotypical subspecies = *schelkownikowi* JACOBSON, 1894), body smaller and more slender, length of male 4.5 mm. (subsp. *angorensis* LOPATIN, 2002). Often considered as subspecies of *chloris* (thesis 3) because of great resemblance of aedeagi (with triangular apex). Distributed in Asia Minor, Transcaucasia, Mesopotamia and W Iran ..... **biornata** LEFÈVRE, 1872.
4. Lateral margin of pronotum very narrow, in the middle barely perceptible. Length of male 4.3 mm. Perhaps a southern form or race of *viridis* (antithesis 4) ..... **aeneoviridis** LOPATIN, 1975.
- . Lateral margin of pronotum well-developed on whole length. Length 3.9–5.1 (female) to 4.2–5.8 mm (male). Forms two subspecies: upper side almost bare

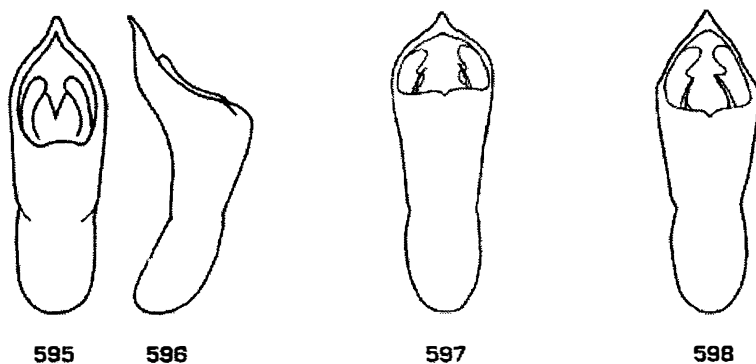
- (nominotypical subspecies = *russowi* HEYDEN, 1889), upper side covered by hairs (subsp. *comans* JACOBSON, 1925). Distributed in N Iran and W Turkmenistan (subsp. *comans*) and from E Turkmenistan to E Kirgisia (nominotypical subspecies) ..... ***viridis*** (KRAATZ, 1882).
5. Elytra entirely metallic ..... 6.  
 - Elytra partly or (very rarely) entirely pale, yellow or reddish ..... 10.
6. Species from E Asia. Length of body under 4.0 mm ..... 7.  
 - Species from Europe, Mediterranean area and Near East ..... 8.
7. In male clypeus rather narrowly, triangularly emarginate. Body entirely blue-black, upper side strongly punctate. Length 3.3–3.6 mm (= *kusanagii* CHŪJŌ, 1940). Distributed in basin of Amur, Korea and Japan ..... ***golda*** JACOBSON, 1925.  
 - In male emargination of clypeus very broad, arch-shaped. Remaining characters as in *golda* (thesis 7). Length 2.8–3.4 mm. Perhaps here *blackwerderi* GRESSIT et KIMOTO, 1961, almost 4.0 mm long, described from W China (Sikang). Distributed in Mongolia and NE China ..... ***mandzhura*** (JACOBSON, 1925).



Figs 592-594. Apical half of aedeagus in dorsal and lateral view (592, 593 after ERBER and MEDVEDEV 1999, 594 after MEDVEDEV 1992) 592, 593 – *Smaragdina* (*Smaragdina*) *viridana*; 594 – *S. (S.) clypealis*.

8. Pronotum distinctly finer punctate than elytra. Aedeagus as in figs 357, 358. Forms three subspecies: upper side unicolorous, body smaller (3.2–4.3 mm) and finer punctate (subsp. *hypocrita* LACORDAIRE, 1848), upper side unicolorous, body relatively great (4.5–5.5 mm) and a little stronger punctate (nominotypical subspecies = *aenea* GERMAR, 1824), each elytron with orange apical spot (subsp. *amabilis* LACORDAIRE, 1848). Distributed in central and southern Spain (*amabilis*), northern Spain, France and Italy (nominotypical subspecies), Bulgaria, Romania and Asia Minor (*hypocrita*) ..... ***concolor*** (FABRICIUS, 1792).  
 - All the upper side uniformly, densely and strongly punctate ..... 9.
9. Pronotum broader than elytra. In male mandibles not distinctly widened at base. Length 4.3–5.8 mm. General view as in plate XVI, phot. 139. Variations: upper side green (typical form), upper side dark bluish (ab. *azurea* REICHE, 1858). Forms three

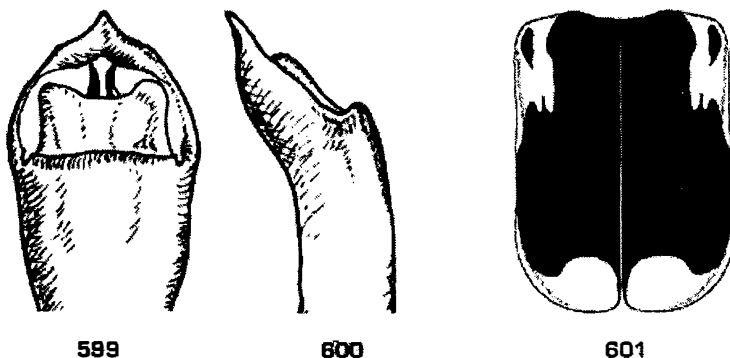
- subspecies: first antennomere metallic, aedeagus as in figs **592, 593** (nominotypical subspecies), first antennomere entirely reddish or dorsally darkened only (subsp. *heinzi* ERBER et MEDVEDEV, 1999), body very small, length about 3.5 mm (subsp. *marionutensis* WITTMER, 1936, described from N Egypt, perhaps only a dwarf form). Nominotypical subspecies distributed in Syria, Iraq, Israel and southern part of Asia Minor, subsp. *heinzi* in central Jordania ..... ***viridana*** (LACORDAIRE, 1848).
- In male mandibles broad, flattened above and distinctly widened at base. Aedeagus as in fig. **594**. Length 4.8–4.9 mm. Described from Israel ..... ***clypealis*** (MEDVEDEV, 1992).
10. Legs entirely black with metallic reflex ..... **11**.  
 – In legs at least tibiae yellow or reddish ..... **13**.
11. Elytra metallic with orange apical spot only. Here *S. concolor amabilis* (see thesis 8).  
 – Elytra yellowish with very broad, posteriorly often widened sutural stripe or metallic with two large spots (humeral and apical) ..... **12**.



Figs 595-598. Aedeagus in dorsal and lateral view (597 after WARCHAŁOWSKI 2000, remaining after WARCHAŁOWSKI 1991): 595, 596 – *Smaragdina (Smaragdina) limbata*; 597 – *S. (S.) clypealis*; 598 – *S. (S.) limbifera*.

12. Head, pronotum and the mentioned stripe blackish-green with vivid metallic lustre. General view as in plate XVI, **phot. 140**. Aedeagus as in figs **595, 596**. Length 5.4–6.6 mm (= *dorsalis* OLIVIER 1808). Variations: sutural stripe very broad, the yellowish lateral margins narrow, parallel (ab. *cincta* LEFEVRE, 1876), pale marking reduced, reflex on metallic coloured parts golden-aeneous (ab. *aurichalcea* MARCU, 1938). E Mediterranean species, distributed in Balcanian Peninsula, Asia Minor, Caucasian countries, Middle East and northern Iran ..... ***limbata*** (STÉVEN, 1806).  
 – Upper side violaceous, on elytra pale lateral stripe divided into two area at humerus and at apex. Blackish humeral spot isolated, surrounded by pale humeral area. Length 4.7–5.8 mm. Described from N Iran ..... ***rapillyi*** (LOPATIN, 2002).
13. Elytral suture entirely yellow or pale reddish. In posterior part of each elytron a great, usually round or oval, bluish-black spot. Length 4.1–5.6 mm (= *menetriesii*

- FALDERMANN, 1837). General view as in plate XVI, **phot. 141**. Variations: elytral spot very small (ab. *venusta* LEFÈVRE, 1872), elytra unicolorous pale orange, without black pattern (ab. *aegyptiaca* LEFÈVRE, 1872). Distributed in Asia Minor, Caucasian countries, Egypt, Syria and Iraq ..... ***unipunctata*** (OLVIER, 1808).
- Suture at least partly black ..... **14.**
  - 14. Femora yellow. W Mediterranean species ..... **15.**
  - Femora black ..... **16.**
  - 15. Elytra greenish-blue or blue with yellowish-orange apical spot, lateral borders bluish, epipleura entirely black. Legs yellowish-orange, last two tarsomeres more or less darkened, usually brownish. General view as in plate XVI, **phot. 142**. Apical part of aedeagus (fig. **362**) shorter, in broad outline roundish, its sides slightly but distinctly sinuate. Length 3.4–4.2 mm. Rather widely distributed in Morocco, Algeria and S Spain ..... ***gratiosa*** (LUCAS, 1845).
  - Elytra green or green with golden reflex, with yellow or yellowish-orange apical spot and yellow marginal borders, epipleura entirely yellow. Legs usually entirely yellowish-orange, rarely last two tarsomeres slightly darkened, at most pale brownish. General view as in plate XVI, **phot. 143**. Apical part of aedeagus (fig. **365**) longer, in broad outline triangular, its sides not or indistinctly sinuate. Length 3.4–4.2 mm. Known mostly from Middle Atlas, reported also from High Atlas ..... ***limbifera*** (ESCALERA, 1928).



Figs 599-601. *Smaragdina (Smaragdina) furthi* (after ERBER and MEDVEDEV 1999): 599, 600 aedeagus in dorsal and lateral view; 601 – elytral pattern.

- 16. Pronotum and elytra finely punctured. Elytra without humeral spot, pale orange with a shorter or longer, bluish-black, posteriorly often enlarged sutural stripe. General view as in plate XVI, **phot. 144**. Length 4.0–6.0 mm. Variations: sutural stripe posteriorly not enlarged (typical form), sutural stripe posteriorly enlarged (ab. *latemaculata* PIC, 1897). Distributed in Asia Minor, Lebanon and Syria, also recorded in Bulgaria ..... ***scutellaris*** (LEFÈVRE, 1872).
- Pronotum and elytra strongly punctured ..... **17.**
- 17. Elytra with humeral spot ..... **18.**

- Elytra without humeral spot, pale with shortened black sutural stripe and (not always) one lateral spot, sometimes fused with sutural stripe as in *scutellaris* ab. *latemaculata* (thesis 14). Length 3.8–4.5 mm. Described from Jordan ..... *jordanica* MEDVEDEV, 2002.
- 18. Body green blue. Elytral pattern as in fig. 601. Aedeagus as in figs 599, 600. Length about 4.8 mm. Described from Israel ..... *furthi* ERBER et MEDVEDEV, 1999.
- Body blue or blue violaceous, on elytra central part or at least broad sutural stripe black with metallic shine. Length 4.0–4.9 mm. Described from Iran ..... *persica* (PIC, 1911).

Genus *Tituboea* LACORDAIRE, 1848

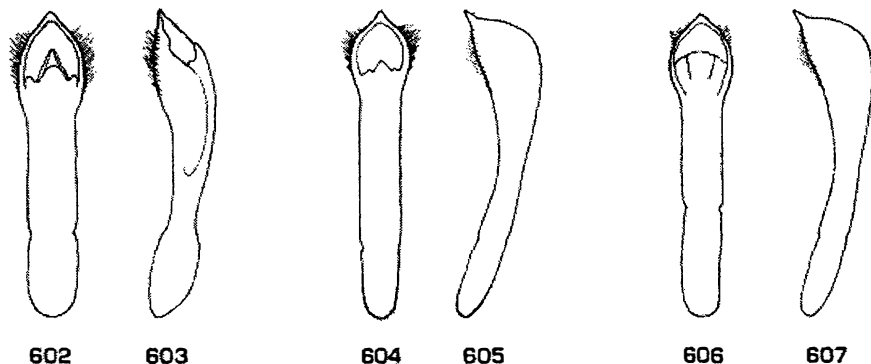
Systematics of the genus *Tituboea* has not been fully investigated and at present it is hard to indicate natural affinities existing within genus. The investigations carried in the last fifty years resulted in the description of over 25 new species. They were mostly based on very short series or on single specimens, which prevents definition and description of their range and morphological variability. In such conditions it is necessary to introduce for dichotomic division – rather unreliable – characteristics reflecting individual variability (colouration of body) and biogeographic criteria, thus basing final identification of specimens on aedeagus structure. In the discussed area almost 60 species occur.

The doubtful species: *Tituboea obliquata* LACORDAIRE, 1848, an African species reported also from Yemen, not included in the key.

Key to species

- 1. Lateral margin of elytron shallowly emarginate ..... 2.
- Lateral margin of elytron deeply emarginate ..... 4.
- 2. Legs yellowish, knees and tarsi black, femora sometimes darkened, brownish. On each elytron a humeral spot and two, usually confluent, postmedian spots. General view as in plate XVII, **phot. 145**. Aedeagus as in figs 602, 603. Length 7.5–9.0 mm (female) to 8.0–11.5 mm (male) (= *grandipes* FORSBERG, 1821). Variations: pronotum black with incomplete yellowish borders, posterior spot in elytron great (a dark form, ab. *ciliciensis* PIC, 1904), on each elytron three black spots (1, 2) (ab. *armeniaca* PIC, 1918). Distributed in south-eastern Europe and Asia Minor, from Austria and Albania to basin of Volga and Caucasian countries ..... *macropus* (ILLIGER, 1800).
- Legs black, ventral part of femora sometimes reddish ..... 3.
- 3. Pronotum black or red with black spots. General view as in plate XVII, **phot. 146**. Aedeagus as in figs 604, 605. Length 8.0–11.5 mm (= *nigricollis* HEYDEN 1886). Very variable: pronotum black, elytra unicolorous reddish (ab. *vaulogeri* PIC, 1939), pronotum black, his borders partly testaceous, elytron with one (humeral) spot only (ab. *uninotata* PIC, 1939), pronotum red with five or more dark spots, on each elytron three black dots (ab. *parviceps* LACORDAIRE, 1848, = ab. *leprieuri* PIC, 1895, = ab. *semiundulata* PIC, 1939). Perhaps local variations of *T. sexmaculata*. Distributed in Algeria ..... *illigeri* (LACORDAIRE, 1848).
- Pronotum and elytra reddish. Pronotum sometimes with little brownish spots, on each elytron usually three black spots (1.2). General view as in plate XVII, **phot.**

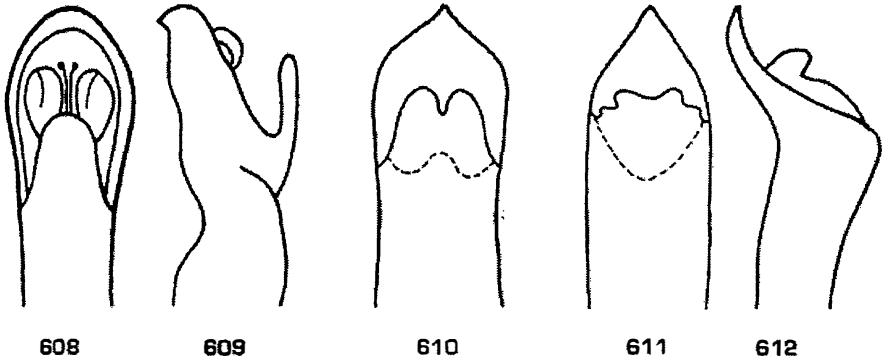
- \* **147.** Aedeagus as in figs **606, 607**. Length 9.0–12.5 mm. Variations: ventral side of femora reddish (ab. *fulvipes* LEFÈVRE, 1872), pronotum with four brownish spots (ab. *parviceps* LAORDAIRE, 1848), elytron with only one (humeral) spot (ab. *humeralifer* PIC, 1900), elytron with 2 spots (ab. *akbesiana* PIC, 1897). A mediterranean species, distributed from north-western Africa, Iberian Peninsula and southern France to Asia Minor, Syria and northern Iran ..... ***sexmaculata*** (FABRICIUS, 1781).
4. Species from Arabian Peninsula ..... **5.**  
 –. Species from other areas ..... **11.**  
 5. Elytra pubescent ..... **6.**  
 –. Elytra glabrous ..... **7.**



Figs 602-607 (after WARCHAŁOWSKI 2003). Aedeagus in dorsal and lateral view: 602, 603 – *Tituboea macropus*; 604, 605 – *T. illigeri*; 606, 607 – *T. sexmaculata*.

6. Fore femora covered by numerous small teeth or tubercles, fore tibiae with a sharp tooth at apex. Body yellowish, on each elytron three black spots (1, 2). Aedeagus as in figs **608, 609**. Female unknown. Length 6.5 mm. Described from Arabian Peninsula ..... ***wittmeri*** (MEDVEDEV, 1988).  
 –. Fore femora smooth, fore tibiae without tooth at apex. Upper side yellowish, on each elytron black transverse band in hind part and sometimes two small spots (iuxtascutallar and humeral) in anterior part. Aedeagus as in fig. **610**. Length 6.0–6.2 mm (= *pubipennis* MEDVEDEV, 1962). Described from Saudi Arabia ..... ***cingulata*** (LEFÈVRE, 1883).  
 7. Hind angles of pronotum at least in male slightly but distinctly elevated ..... **8.**  
 –. Hind angles of pronotum not elevated ..... **10.**  
 8. Pronotum with two black spots at hind margin. Scutellum, underside and pygidium black. On each elytron four black spots (2, 2), hind spots sometimes fused. Length 5.4–5.7 mm. Insufficiently known species, aedeagus not studied. Distributed in Oman. Reported also from Egypt, Israel and Yemen, but all the data are uncertain ... ***decemguttata*** (WALKER, 1871).  
 –. Pronotum uniformly pale ..... **9.**

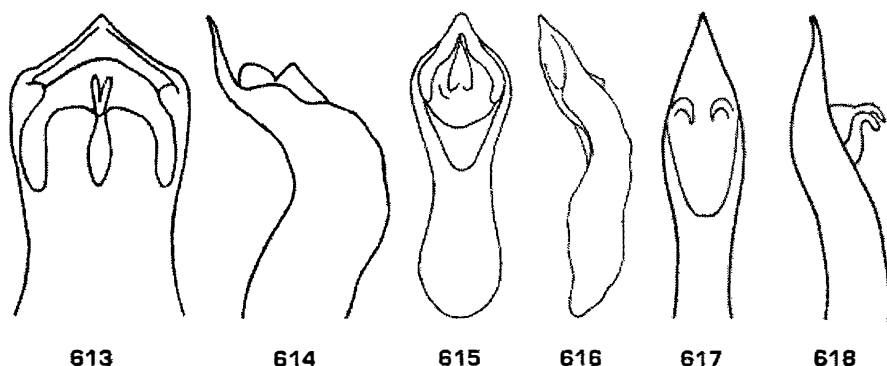
9. Larger. First tarsomere of fore legs much longer than second. Underside usually yellowish or partly slightly darkened. Head and scutellum entirely pale. General view as in plate XVII, **phot. 148**. Aedeagus as in figs **611, 612**. Length 5.7–7.2 mm. Distributed in Arabian Peninsula ..... **ogloblini** (MEDVEDEV, 1962).
- . Smaller. First tarsomere of fore legs only a little longer than second. Underside usually black, pygidium pale. On front usually a black longitudinal stripe, scutellum black. Aedeagus not studied. Length 4.5–5.5 mm (= *fairmairei* LEFÈVRE, 1891). Distributed in Egypt and Arabian Peninsula, reported also from Ethiopia (uncertain) ..... **flitarsis** (LACORDAIRE, 1848).



Figs 608-612. Apical half of aedeagus in dorsal and lateral view (608, 609 after MEDVEDEV 1988, remaining after MEDVEDEV 1962): 608, 609 – *Tituboea wittmeri*; 610 – *T. cingulata*; 611, 612 – *T. ogloblini*.

10. Pronotum entirely pale, on each elytron four black spots (2, 2), legs pale. Abdomen usually pale with marginal black spots on sternites 1–4, sometimes blackish with red anal sternite. Elytral punctures fine but distinct. Aedeagus as in figs **613, 614**. Length 7.0–10.0 mm. Distribution somewhat uncertain. Reported from Egypt, Israel, Iran and Arabian Peninsula; the forms from Egypt and Near East (with darker abdomen) perhaps not conspecific ..... **arabica** (OLIVIER, 1808).
- . On pronotum five blackish spots, femora and tarsi blackish. Length about 7.0 mm. Insufficiently known species, aedeagus not studied. Described from Arabian Peninsula ..... **peyerimhoffi** (PIC, 1902).
11. Body very stout, its length under 2 × longer than broad. Upper side pale, on pronotum blurred reddish spots, on each elytron four small black spots. Legs relatively long, fore tibiae bent. First tarsomere of fore legs as long as tarsomeres 2 + 3. Underside black, prosternum pygidium yellowish. Aedeagus as in figs **615, 616**. Length 6.3 mm. Described from Israel ..... **nevoi** LOPATIN et CHIKATUNOV, 2001.
- . Body less stout, its length at least 2 × (usually more) longer than broad ..... **12**.
12. Posterior angles of pronotum raised ..... **13**.
- . Posterior angles of pronotum not raised ..... **24**.

13. Pronotum uniformly pale, yellowish or reddish ..... 14.  
 -. Pronotum with black or pitchy spots ..... 20.  
 14. Length of body under 4.5 mm ..... 15.  
 -. Length of body over 4.5 mm ..... 16.

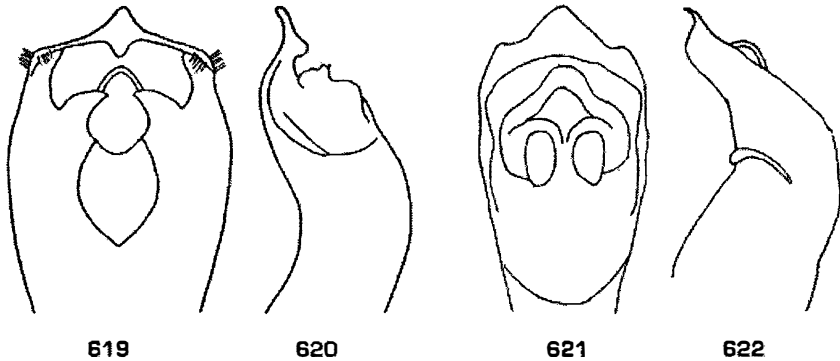


Figs 613-618. Aedeagus in dorsal and lateral view (613, 614 after LOPATIN 2001; 615, 616 after LOPATIN and CHIKATUNOV 617, 618 after LOPATIN 1969): 613, 614 - *Tituboea arabica*; 615, 616 - *T. nevoi*; 617, 618 - *T. minutissima*.

15. On elytron two dark large spots (1, 1). Apex of aedeagus (figs 617, 618) triangular, rather narrowly sharpened. Length 3.5 mm. Described from Afghanistan based on one male only ..... ***minutissima*** (LOPATIN, 1969).  
 -. Elytra with a broad blackish transverse stripe behind middle, shallowly and not very densely punctured. Pronotum entirely pale, densely and finely punctured, hind angles elevated. Underside black except prosternum. Aedeagus not studied. Length of body 4.0 mm. Described from Afghanistan based on one male only ....  
 ..... ***elegantissima*** (LOPATIN, 1966).  
 16. Elytra covered by short, usually sparse, erect hairs, at least before apex . On each elytron in anterior part two small, black spots (humeral and iuxtascutellar), and behind middle a large spot, somewhat transverse. General view as in plate XVII, **phot. 149**. Aedeagus as in fig. 623. Length 5.5-8.4 mm. Variation: on each elytron humeral spot present only, remaining spots disappear (unnamed). Distributed in Transcaspia ..... ***silensis*** WEISE, 1894.  
 -. Elytra bare ..... 17.  
 17. On each elytron two transverse, black bands. Hind band reaches from external margin of elytra almost to suture. Pronotum with two large blackish spots, its surface strongly and sparsely punctured, interstices very finely and densely punctulate. Scutellum black. Underside black except lateral parts of prosternum, borders of anal sternite, pygidium partly pale. Aedeagus as in figs 619, 620. Length 5.3-5.4 mm. Described from SW Iran ..... ***mirzayami*** (LOPATIN, 1985).  
 -. On each elytron three or four spots, sometimes hind spots fused into transverse band ..... 18.



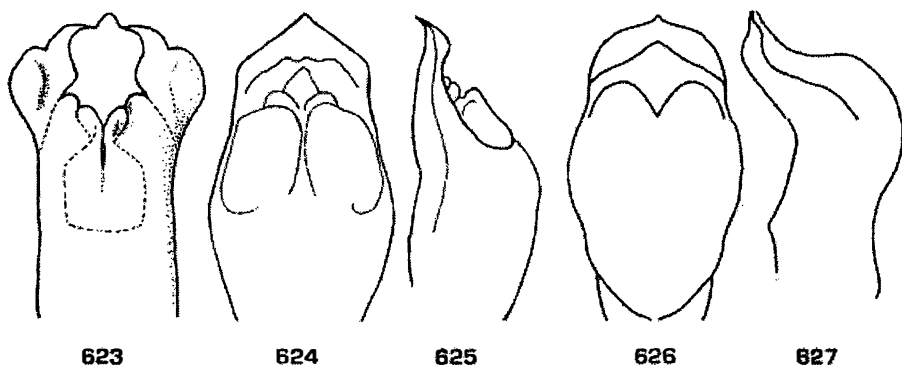
18. On each elytron three (1, 2) black spots, hind spots often fused forming an oblique stripe. Fore (humeral) spot sometimes absent. Pronotum entirely pale, shining, sparsely and finely punctulate. Punctuation of elytra dense and strong, but shallow. Scutellum, abdomen and pygidium black. Aedeagus as in figs **621**, **622**. Length 4.5–6.2 mm. Described from Israel ..... *carmelica* (LOPATIN, 2001).
- On elytron hind pair of spots situated transversely (not obliquely). Scutellum partly pale ..... **19**.
19. Upper side reddish with a blackish spot on frons, black anterior part of scutellum and two transversely situated black spots behind middle of elytra. Underside black, only prosternum partly, anal sternite and pygidium reddish. Aedeagus as in figs **624**, **625**. Length 5.6 mm. Described from Iran, based on one male only ...  
..... *zarudnii* LOPATIN, 2001.
- On each elytron four black spots (2, 2), hind pair often fused. Head uniformly pale, elytra shining, intersices without reticulation. Abdomen and pygidium black, apex of abdomen sometimes paler. Aedeagus as in figs **626**, **627**. Length 4.9–5.5 mm. Variations: on elytron each pair of black spots fused (unnamed), on elytron anterior pair of spots free, hind pair fused (unnamed), on elytron both pairs free (ab. *infasciata* Pic, 1912), on elytron three black spots only, humeral spot absent (unnamed). Distributed in Transcaucasia and Iran ..... *nigriventris* LEFEVRE, 1872.



Figs 619–622. Apical half of aedeagus in dorsal and lateral view (619, 620 after LOPATIN 1985; 621, 622 after LOPATIN and CHIKATUNOV 2001): 619, 620 – *Tituboea mirzayami*; 621, 622 – *T. carmelica*.

20. Elytra pitchy black with pale apex. Pronotum orange with five brownish spots: four forming transverse row and one spot before scutellum. Head blackish with pale clypeus, scutellum black with pale apex. Aedeagus as in figs **628**, **629**. Length 3.7–4.2 mm. Described from Afghanistan ..... *daccordii* (LOPATIN, 1982).
- Elytra yellowish or orange, with black markings ..... **21**.
21. Frons and vertex entirely black, anterior border of clypeus pale ..... **22**.
- Frons with black marking, vertex yellowish red ..... **23**.

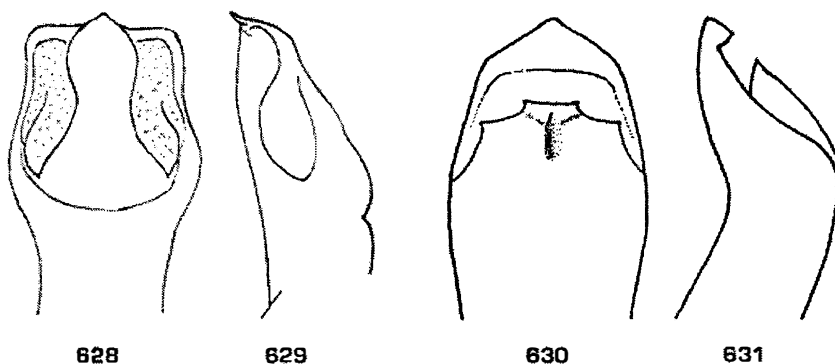
22. Black spots at hind margin of pronotum moderately large, widely separated. Hind pair of spots on elytra fused. Aedeagus as in figs 630, 631. Length 5.3–5.5 mm. Described from Iran based on one pair only ..... *kermanica* (MEDVEDEV, 1962).
- . Black spots on pronotum large. On each elytron 4 (2, 2) black spots. Aedeagus as in figs 632, 633. Length 5.5 mm. Described from Nuristan (Afghanistan), based on a single male only ..... *nuristanica* LOPATIN, 1966.



Figs 623-627. Apical half of aedeagus in dorsal and lateral view (623 after MEDVEDEV 1962, remaining after LOPATIN 2001): 623 – *Tituboea silensis*; 624, 625 – *T. zarudnii*; 626, 627 – *T. nigriventris*.

23. Elytral puncturation rather shallow, tending to form longitudinal rows. Pronotum almost smooth, with two blurred, dark grey spots at base. On each elytron three spots (2, 1), hind spot transverse. Scutellum black. Aedeagus as in figs 634, 635. Length 4.0 mm. Described from Iran, based on two males only ..... *ahwasa* (LOPATIN, 1985).
- . Elytral puncturation entirely random. On pronotum at hind margin two large, transverse spots. On each elytron two transverse bands, anterior band interrupted on suture, hind one joined. Puncturation of elytra arranged in confuse rows, interstices densely punctulate, matt Legs pale, sometimes femora darkened, blackisch, with pale apex. Aedeagus as in figs 636, 637. Length 5.4–5.8 mm. Described from Iran ...  
..... *heptneri* MEDVEDEV, 1957.
24. Pygidium black ..... 25.
- . Pygidium orange or reddish, sometimes blackened basally ..... 29.
25. Pronotum uniformly pale, at most with darker, blurred stripe along middle ..... 26.
- . Pronotum with black spots ..... 27.
26. Elytral epipleura densely covered by short hairs, matt. Margins of elytra shallowly sinuate. Pronotum entirely pale, with darker, blurred stripe along middle, mostly in anterior part only. Elytra shallowly and densely punctate, their anterior half without black pattern. Aedeagus as in figs 638, 639. Length 6.0–7.1 mm. Described from Iran ..... *iranica* MEDVEDEV, 1957.
- . Elytral epipleura at most with several hairs in anterior part. Margins of elytra deeper sinuate. See *macropus* (thesis 2).

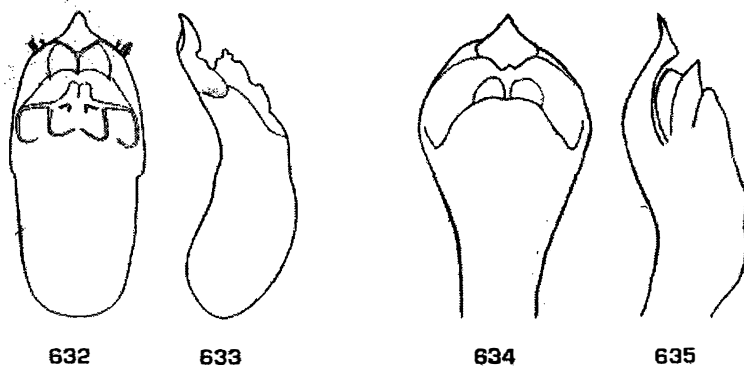
27. Frons and vertex strongly and rugosely punctured. Black spots on pronotum often very large or extended almost to anterior margin. On elytra two pairs of black spots, often fused into two transverse bands, rarely iuxtascutellar spot disappears. Aedeagus as in figs **640**, **641**. Length 4.9–5.5 mm. Distributed in Caucasian countries and N Iran ..... *rugulosa* WEISE, 1898.
- Frons sometimes densely and moderately strongly punctured, but vertex always smooth or covered by very finely puncturation ..... **28**.



Figs 628-631. (628, 629 after LOPATIN 1982; 630, 631 after LOPATIN 2001): 628, 629 – *Tituboea daccordii*; 630, 631 – *T. kermanica*.

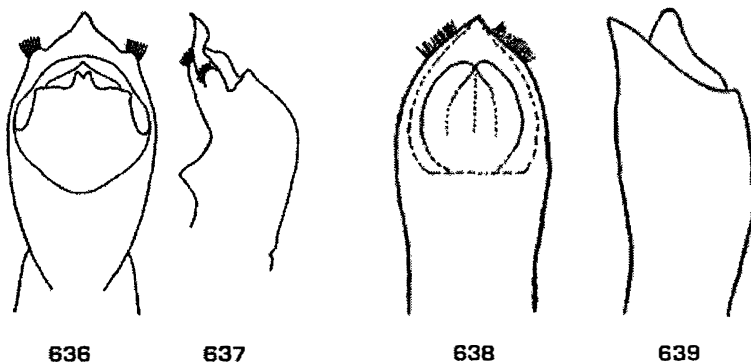
28. Puncturation of pronotum uneven. On elytron four large spots, usually fused into two broad transverse bands. Forms of *mirzayami* (thesis 17).
- Pronotum uniformly, evenly, finely but distinctly punctured, pale with two large basal spots (sometimes fused). Upper side coloured as in *rugulosa* (thesis 27), but anterior pair of spots on elytron always free. Frons strongly, vertex somewhat finer punctured. Aedeagus as in figs **642**, **643**. General view as in plate XVII, **phot. 150**. Length 5.5–5.6 mm. Described from Iran ..... *ornaticollis* (MEDVEDEV, 1957).
29. Length of body over 5.5 mm ..... **30**.
- Leng of body at most 5.3 mm. Three very similar species, distinguishable by shape of aedeagus only ..... **32**.
30. Head entirely pale. Body robust. Length 7.0–9.5 mm. See *arabica*, thesis 10.
- Frons and vertex black ..... **31**.
31. Body more stout Frons rather deeply impressed, in male tarsomere 1 of fore legs not longer than 4. Scutellum black or black with yellowish apex. Colouring rather variable. Pronotum uniformly pale or with 2–4 darker spots in hind part, vertex usually pale. On elytron two pairs of blackish spots, anterior pair sometimes absent. Abdomen black, anal sternite and pygidium sometimes reddish. Aedeagus as in figs **644**, **645**. Length 5.7–7.5 mm. Variations: pronotum uniformly pale (typical form), on pronotum blackish spots (ab. *maculicollis* MEDVEDEV, 1962). Distributed in Turkmenistan and N Iran ..... *puncticollis* (MEDVEDEV, 1962).

- Body more elongate. Frons shallowly impressed, in male tarsomere 1 of fore legs distinctly (1.6 ×) longer than 4. Colouration of body as in *puncticollis* (thesis 31). Aedeagus as in figs 646, 647. Length 7.9 mm. Described from Afghanistan based on one male only ..... **medvedevi** (LOPATIN, 1982).



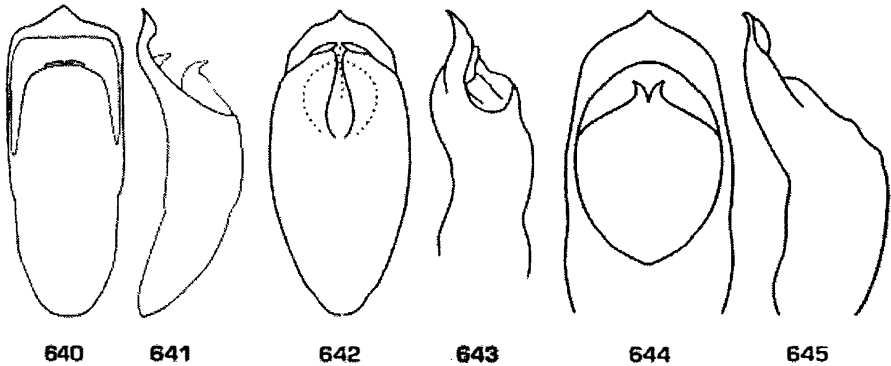
Figs 632-635. Aedeagus in dorsal and lateral view (632, 633 after LOPATIN 1966; 634, 635 after LOPATIN 1985): 632, 633 – *Tituboea nuristanica*; 634, 635 – *T. ahwasa*.

- 32. Apex of aedeagus (figs 648, 649) with distinct lamella. Upper side rust-yellow, on each elytron four (2, 2) or two (0, 2) black spots; fore pair, if present, very small. Punctuation of elytra dense and rather strong, but shallow, disappearing in apical part. Length 3.8–5.0 mm. Described from Afghanistan ..... **afghana** (MEDVEDEV, 1978).
- Apex of aedeagus without distinct lamella ..... 33.



Figs 636-639. Apical half of aedeagus in dorsal and lateral view (after LOPATIN 2001): 636, 637 – *Tituboea heptneri*; 638, 639 – *T. iranica*.

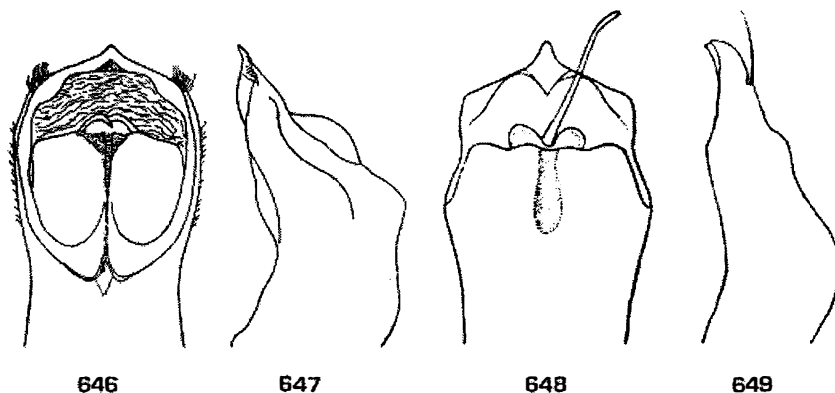
33. Apex of aedeagus (figs **650**, **651**) broadly triangular, operculum very broad with shallow impression in the middle. Pronotum sparsely and finely punctate. On each elytron two black spots in anterior part and a transverse stripe behind middle. Length 4.4–5.3 mm. Described from Iran ..... ***affinis*** MEDVEDEV, 1957.
- . Apex of aedeagus with gently rounded sides. Colouring of body similar as in *puncticollis* (thesis 31) ..... **34.**



Figs 640-645. Aedeagus in dorsal and lateral view (after LOPATIN 2001): 640, 641 – *Tituboea rugulosa*; 642, 643 – *T. ornaticollis*; 644, 645 – *T. puncticollis*.

34. Aedeagus (figs **652**, **653**) slightly constricted behind apex. Upper side yellow orange, at base of pronotum two small blackish spots. On each elytron a small humeral spot and rather short transverse band. Spots on pronotum and humeral spot sometimes strongly reduced or disappearing. Length 4.8–5.3 mm. Described from Iran ..... ***rufopygus*** (LOPATIN, 1985).
- . Aedeagus (figs **654**, **655**) not constricted behind apex. Length 3.5–5.0 mm. Described from Iran ..... ***pusilla*** LOPATIN, 2001.
35. In male first segment of anterior tarsi very long. Pronotum orange-reddish, sometimes with 2–5 rather indistinct dark spots. Elytron dark yellowish or pale testaceous with 4 obliquely situated, black spots. Scutellum always black. Tibiae usually reddish ..... **36.**
- . In male first segment of anterior tarsi not very long ..... **38.**
36. Anterior margins of elytra and anterior part of epipleuron with long hairs. Pronotum usually unicolorous, sometimes with indistinct brownish spots. Each elytron with 2 black spots (2, 2). General view as in plate XVII, **phot. 151**, in female as in plate XVII, **phot. 152**. Aedeagus as in figs **652**, **653**. Length 6.0–8.0 (female) to 7.0–9.5 mm (male). Variations: body smaller (5.0–6.0 mm), basal part of antennae and legs darker (ab. *mecheriensis* PIC 1895, possibly a form of *tredecimpunctata*, thesis 37), legs and antennae black (ab. *hypomelaena* BEDEL, 1921), on elytron only one (humeral) spot (ab. *unipunctata* PIC, 1897), on elytron three spots (ab. *siciliensis* PIC, 1912). Distributed in Morocco, Algeria and Sicily ..... ***octopunctata*** (FABRICIUS, 1787).

- Anterior margins of elytra and anterior part of epipleuron with short hairs. Pronotum with 2-5 indistinct brownish dots, rarely with 5 blackish spots (typical form). Each elytron with 4 (2, 2) obliquely situated spots ..... **37**.
- 37. Length 5.5-7.0 mm (female) to 6.3-7.5 mm (male). Legs black with tibiae partly or almost entirely reddish. General view as in plate XVII, **phot. 153**. Aedeagus as in fig. **658, 659** (= *urikkana* TOMOV, 1983 = ?*minor* FAIRMAIRE, 1894<sup>5</sup>). Variation: on pronotum three black dots (ab. *kocheri* PIC, 1949). Distributed in Morocco and Algeria ..... ***tredecimpunctata*** (DESBROCHERS, 1870).
- Length 5.4 mm (female) to 6.0 mm (male). Pronotum entirely pale, coarsely and sparsely punctured Aedeagus as in figs **660, 661**. Legs red with blackish tarsi. Described from Israel ..... ***israelita*** (MEDVEDEV, 1992).

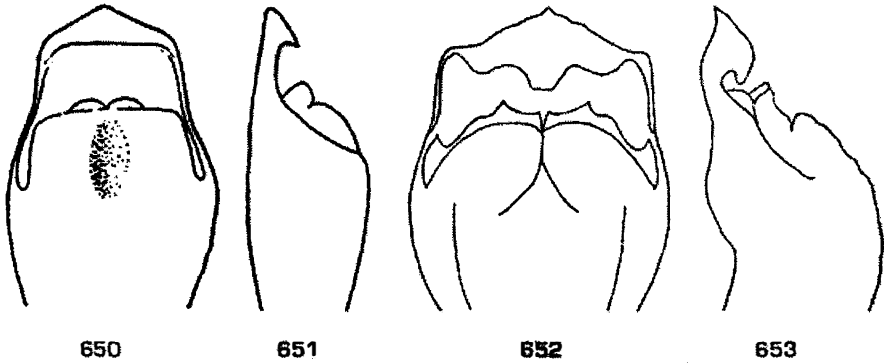


Figs 646-649. Apical half of aedeagus in dorsal and lateral view (646, 647 after LOPATIN 1982, 648, 649 after MEDVEDEV, 1978): 646, 647 - *Tituboea medvedevi*; 648, 649 - *T. afghana*.

- 38. Legs black or (in insufficient mature specimens) uniformly brown ..... **39**.
- Legs partly or entirely yellowish ..... **46**.
- 39. Pronotum densely punctate with anterior and lateral margins yellowish. On each elytron in anterior part two black, obliquely situated spots, in hind part a broad, transverse black stripe. Aedeagus not studied. General view as in plate XVIII, **phot. 154**. Length about 9.0 mm. Reported from Egypt .....  
..... ***olivieri*** (LACORDAIRE, 1848).
- Colouring of elytra not as above ..... **40**.
- 40. Anterior femur basally deeply emarginate (the *paykulli*-group). Scutellum usually entirely pale. Pronotum orange, elytra dark yellow, each elytron with 4 great, black spots. Abdomen black, mesosternum sometimes dark reddish. Length 8.0-10.5 mm ..... **41**.
- Anterior femur not emarginate ..... **44**.

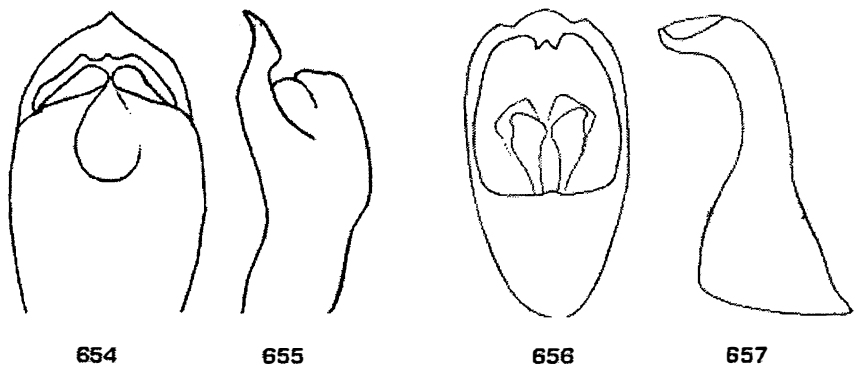
<sup>5</sup> *T. tredecimpunctata*: insufficient description based on one specimen only. Its variations described from Egypt (ab. *decemmaculata* PIC, 1937 and ab. *atriceps* PIC 1923) probably not here.

41. In male left mandibula long, sharp, obliquely projecting ..... **42.**  
 -. In male left mandibula without spine-like projection. Underside black. Prothorax with two large piceous spots on hind half and a very little one before scutellum. Aedeagus as in figs **662, 663**. Length 9.5 mm (= *femorata* MEDVEDEV, 1962). Described from Tunisia, based from one specimen only ..... **femoralis** (MEDVEDEV, 1962).



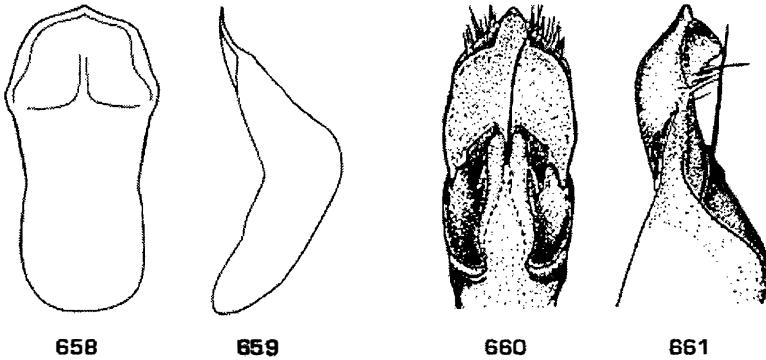
Figs 650-653. Apical half of aedeagus in dorsal and lateral view (after LOPATIN 2001): 650, 651- *Tituboea affinis*; 652, 653 - *T. rufopygus*.

42. Pronotum broader than elytra. Perhaps an eastern form of *T. paykulli*. Variation: black pattern in hind part of elytra partly joined (ab. *subjuncta* PIC, 1903). General view as in plate XVIII, **phot. 155**. Aedeagus as in figs **664, 665**. Length 8.5-10.0 mm (= *algerica* DESBROCHERS, 1870). Distributed in Algeria, Tunis, Egypt, ?Asia Minor ...  
 ..... **laticollis** (OLIVIER, 1808).  
 -. Pronotum as broad as elytra ..... **43.**



Figs 654-657. Aedeagus in dorsal and lateral view (654, 655 after LOPATIN 2001; 656, 657 after WARCHALOWSKI 2003): 654, 655 - *Tituboea pusilla*; 656, 657 - *T. octopunctata*.

43. Elytra without pubescence. General view as in plate XVIII, **phot. 156**. Aedeagus as in figs **666**, **667**. Length 8.5–10.0 mm. Variation: on pronotum basally two rather great black spots and one little before scutellum (ab. *trinotaticollis* KOCHER, 1958). Distributed in Algeria ..... *paykulli* (LACORDAIRE, 1848).  
 - Elytra covered by pubescence. Colouring of body as in *paykulli* ab. *trinotaticollis* (thesis 43). Aedeagus not studied. Length 8.5–10.0 mm. Described from High Atlas ..... *hirsutula* (KOCHER, 1958).



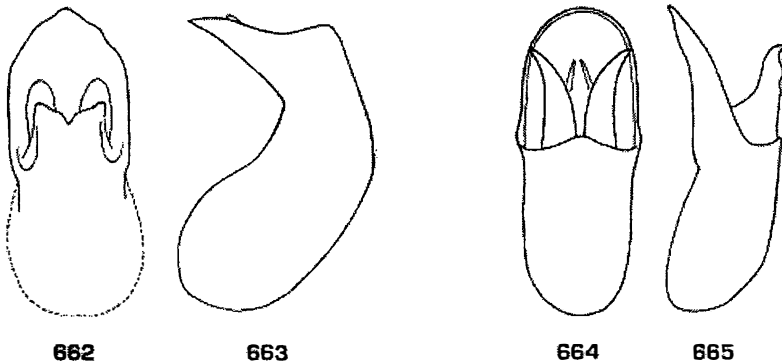
Figs 658-661. Aedeagus in dorsal and lateral view (658, 659 after WARCHALOWSKI 2003; 660, 661 after MEDVEDEV 1992): 658, 659 – *Tituboea tredecimpunctata*; 660, 661 – *T. israelita*.

44. Central part of pronotum relatively strong and distinctly punctate. Body black, ground colour of elytra dark yellowish, on each elytron four black spots, first 3–4 antennomera orange or reddish. In male first segment of anterior tarsi short, about two times shorter than distance between eyes. Aedeagus as in figs **668**, **669**. Length 9.0–10.5 mm. Known from Algeria only ..... *octosignata* (FABRICIUS, 1801).  
 - Central part of pronotum very finely and shallowly punctate, often almost impunctate ..... 45.  
 45. Head almost always black. First tarsomere of anterior tarsi longer, in male about as long as the distance between eyes, in female longer than the second. Colouring of body very variable. In male pronotum (plate XVIII, **phot. 157**) usually black, sometimes bicolorous (anteriorly pale), very rarely unicolorous red, in female (plate XVIII, **phot. 158**) usually red with a little brownish spot before scutellum (ab. *novempunctata* DUFOUR, 1820), sometimes with further 2–4 brown spots, rarely black with anterior margin reddish (ab. *maculicollis* BRULLÉ, 1832). Elytra always red or yellowish. On each elytron normally 4 little blackish spots (2, 2), sometimes very great and partly confluent (ab. *legionis* KOCHER, 1958), rather rarely 2 or 3 (ab. *sexpunctata* OLIVIER, 1808) or one spot only (typical form = ab. *vagenotata* PIC, 1939). Aedeagus as in figs **670**, **671**. Length 7.5–10.0 mm (= *rectangulum* BONELLI, 1812, *dispar* LUCAS, 1845). Distributed in western part of mediterranean area: Portugal, Spain, Morocco, Algeria, Sardinia, Sicily, southern Italy ..... *biguttata* (OLIVIER, 1791).



- Head red. In female first tarsomere of anterior tarsi as long as the second. Externally similar to female of *biguttata* (thesis 14), but pronotum less more feebly narrowed anteriorly and elytra a little stronger punctured. Colouring of upper side as in *biguttata* ab. *legionis*: on elytra anterior pairs of spots situated very obliquely, hind pair confluent, forming a transverse stripe. Length about 8.0 mm. Distributed in Algeria, recently synonymized with *biguttata* ..... ***attenuata*** (FAIRMAIRE, 1875).
- 46. Anterior femur basally deeply emarginate (the *paykulli*-group). Head behind eyes strongly constricted. Vertex normally with a transverse black stripe. General view as in plate XVIII, **phot. 159**. Aedeagus not studied. Length 8.5–9.5 mm. Variations: on each elytron four great black spots (2, 2) and one little dot at apex (typical form, rather rarely encountered), on each elytron only four spots (ab. *obliterata* PIC, 1897), on pronotum two black spots in basal part (ab. *binotaticollis* PIC, 1914), on each elytron hind spots confluent (ab. *semiconjuncta* PIC, 1914), head without black stripe (ab. *infasciata* KOCHER, 1952). Distributed in northern Sahara in Morocco and Algeria ..... ***fasciata*** LEFÈVRE, 1872.
- Anterior femur basally not emarginate ..... **47**.
- 47. On each elytron in anterior part two obliquely situated black spots, in hind part a broad, transverse black stripe ..... **48**.
- On each elytron four or five black spots ..... **50**.

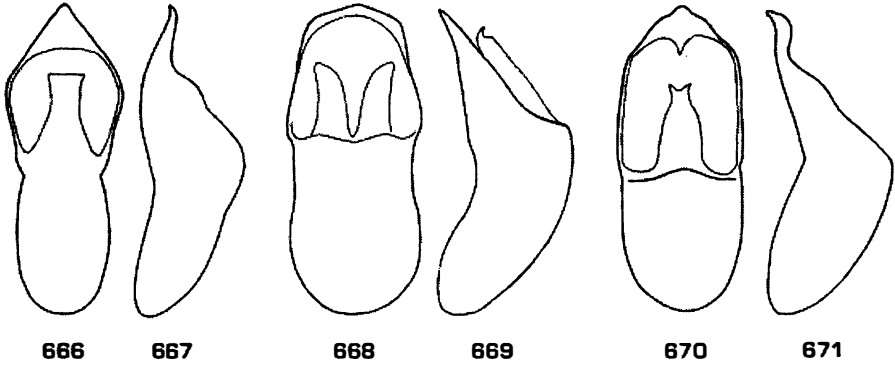
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Figs 662-665. Aedeagus in dorsal and lateral view (662, 663 after MEDVEDEV 1962; 664, 665 after WARCHALOWSKI 2003): 662, 663 – *Tituboea femoralis*; 664, 665 – *T. laticollis*.

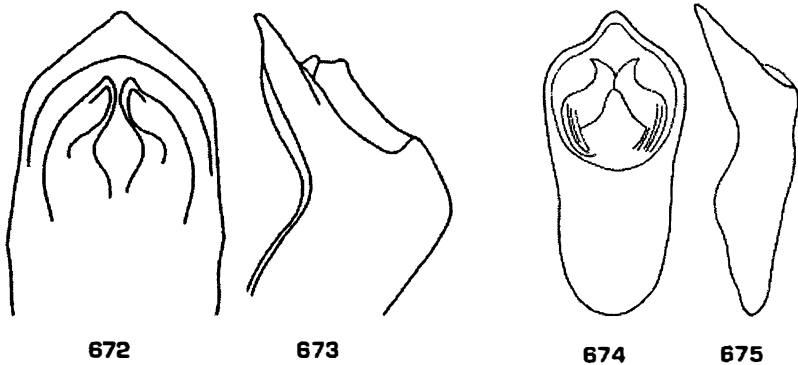
- 48. Punctuation of elytra strong and deep, partly arranged in indistinct longitudinal rows. Frons and vertex black. On pronotum two large broadly separate black spots at hind margin, on elytra with two black transverse bands. Anterior band interrupted on suture, posterior bands fused. Aedeagus as in figs 672, 673. Length 6.2–7.0 mm. Described from Israel based on three specimens ..... ***hebraica*** (LOPATIN, 1996).
- Punctuation of elytra fine or very fine ..... **49**.
- 49. Aedeagus (figs 613, 614) not particularly short and broad. Elytral punctures fine but distinct. See *arabica* (thesis 10).

- Aedeagus short and broad (figs 674, 675). Elytral punctures rather indistinct. Length 6.5–7.0 mm. Described from Israel ..... **chikatunovi** (LOPATIN, 1995).
- 50. On each elytron five (2, 2, 1) spots. Femora and two apical segments of tarsi darkened. General view as in plate XVIII, **phot. 160**. Aedeagus as in figs 676, 677. Length 5.5–6.5 mm (= *elegans* WEISE, 1898). Variation: two central spots confluent (ab. *semijuncta* PIC, 1918). Occurs in Morocco and Algeria .... **chobauti** (PIC, 1896).
- On each elytron four spots (2, 2). Legs entirely pale ..... **51**.



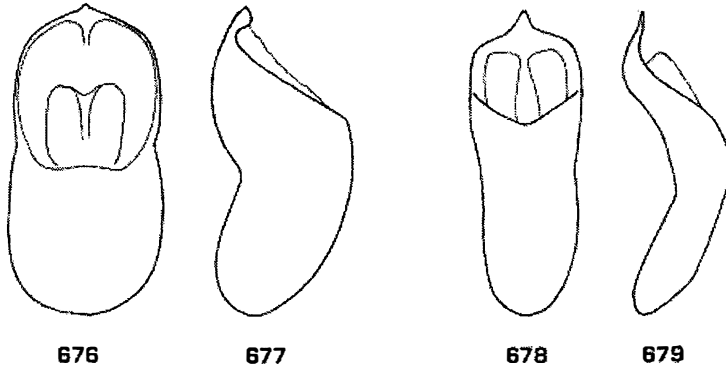
Figs 666-671. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 2003): 666, 667 – *Tituboea paykulli*; 668, 669 – *T. octosignata*; 670, 671 – *T. biguttata*.

- 51. Abdomen pale, testaceous, anteriorly more or less brownish ..... **52**.
- Abdomen black or black with pale apex ..... **55**.



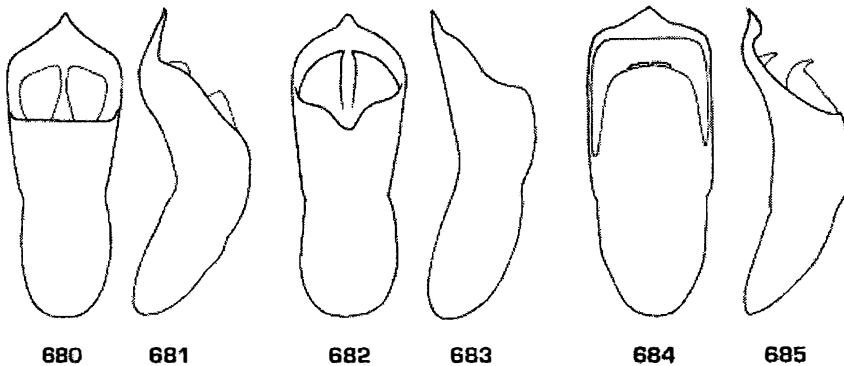
Figs 672-675. Aedeagus in dorsal and lateral view (672, 673 after LOPATIN 1996; 674, 675 after LOPATIN 1995): 672, 673 – *Tituboea hebraica*; 674, 675 – *T. chikatunovi*.

52. Length of body 5.0–6.0 mm. In male fore tarsi nearly as long as tibia ..... 53.  
 -. Length of body over 7.0 mm ..... 54.



Figs 676-679. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 2003): 676, 677 – *Tituboea chobauti*; 678, 679 – *T. reymondi*.

53. Occurs in Syria. Body relatively narrow, slightly narrowed posteriad. Aedeagus not studied. Length 5.5 mm ..... *testaceiventris* (PIC, 1913).  
 -. Occurs in Morocco. Body subcylindrical. General view as in plate XVIII, **phot. 161**. Length 5.0–6.0 mm. Variation: frons with a transverse black stripe (ab. *subfasciata* KOCHER, 1956). Aedeagus as in figs 678, 679. Colouring of body and the form of aedeagus almost identical as in *subabbreviata* (thesis 22). Perhaps a west-mediterranean race of the mentioned species ..... *reymondi* (KOCHER, 1956).



Figs 680-685. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 2003): 680, 681 – *Tituboea subabbreviata*; 682, 683 – *T. perrisi*; 684, 685 – *T. rugulosa*.

54. On elytron hind external spot situated normally. Aedeagus as in figs **680**, **681**. Length usually 7.0–8.0 mm. Variations: vertex with a black spot (ab. *notaticeps* PIC, 1912), body great and robust, length about 9.0 mm (ab. *robustior* PIC, 1912), similar to robustior, but on each elytron two hind spots only (ab. *bisbinotata* PIC, 1912). Described from Egypt ..... *subabbreviata* (PIC, 1912).
- . On elytron hind external spot situated in relatively great distance from lateral margin. Aedeagus not studied. Length 7.0–8.0 mm. Described from Morocco ..... *testaceipes* (PIC, 1939).
55. Elytral punctures extremely shallow, indistinct, nearly absent. Upper side dark yellowish or reddish-testaceous; scutellum and four black spots on each elytron (2, 2) black. Underside bicolorous: prosternum and apex of abdomen yellowish, meso- and metasternum alike the remaining part of abdomen black. General view as in plate XVIII, **phot. 162**. Aedeagus as in figs **682**, **683**. Length 6.5–8.0 mm. Distributed in Algeria and Tunisia ..... *perrisi* (DESBROCHERS, 1870).
- . Elytral punctures distinct, rather strong ..... **56**.
56. Length of body 7.0–8.0 mm. Underside entirely black. Elytra strongly and densely punctate, pronotum narrower than elytra, relatively short, his lateral margins rather straight. Aedeagus not studied. Described from Egypt ..... *mokattamensis* (PIC, 1912).
- . Length of body less than 6.5 mm ..... **57**.
57. Elytra strongly, very densely, rather coarsely punctate. Upper side dark yellowish, on pronotum two great black spots, on elytra 4 (2, 2) black spots, theirs posterior pair often confluent. Underside black. Aedeagus as in figs **684**, **685**. Length 5.5–6.5 mm. Distributed in Caucasian countries ..... *rugulosa* (WEISE, 1898).
- . Elytra not densely punctate, Colouring of pronotum and elytra as in *T. perrisi* (thesis 55), head with transverse black stripe. Aedeagus not studied. Length 6.0 mm. Described from Libya, based on one specimen only ..... *fasciiceps* (PIC, 1929).

## Subfamily *Cryptocephalinae*

### Key to genera

1. Scutellum invisible from above, body small, cylindrical, upper side covered with erect hairs (tribe *Stylosomini*). Body small, its length always under 2.8 mm ..... ***Stylosomus*** (p. 362).  
-. Scutellum large, distinct .....
2. Prothorax not margined posteriorly, closely fitted to basis of elytra (tribe *Cryptocephalini*) ..... **3.**  
-. Prothorax margined posteriorly, not closely fitted to basis of elytra (tribe *Pachybrachini*) ..... **6.**
3. Third tarsomere narrow, not bilobed. In female fossa ovigera longitudinal, very large and deep ..... ***Jaxartiolus*** (p. 320).  
-. Third tarsomere broad, incised or bilobed .....
4. Claws denticulate (one species described from N China, E Siberia and Kurile Isl.) ...  
..... ***Suffrianus*** (p. 369).  
-. Claws usually simple, rarely appendiculate, never denticulate .....
5. Antenna shorter than half of body length, terminal segments usually thickened. Body small (under 3.0 mm), short and stocky ..... ***Melixanthus*** (p. 321).  
-. Antenna longer than half of body length, filiform, if short (*Cryptocephalus*, subgenus *Cerodens*), than body length over 4.0 mm ..... ***Cryptocephalus*** (p. 175).
6. Apex of scutellum elevated. Epipleura of elytra widened anteriorly. Upper side usually hairless ..... ***Pachybrachis*** (p. 322).  
-. Apex of scutellum not elevated. Epipleura of elytra on whole length very narrow, sometimes almost imperceptible. Upper side covered with fine hairs .....  
..... ***Acolastus*** (p. 147).

Genus *Acolastus* GERSTAECKER, 1855

Literature: SCHÖLLER and WARCHALOWSKI 2009.

*Thelyterotarsus* WEISE, 1882; *Falsopachybrachys* PIC, 1947; *Serrinotus* TAN, 1992; *Pachylanka* MEDVEDEV, 1989.

### Key to subgenera

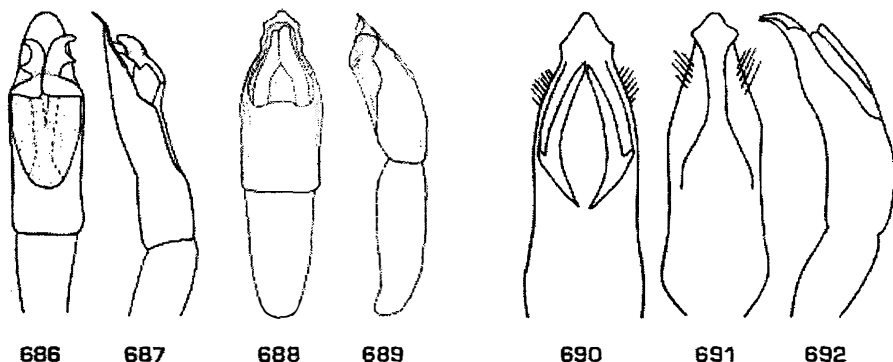
1. Lateral margin of pronotum crenulated or with a few distinct small teeth on hind part ..... **2.**  
-. Lateral margin of pronotum smooth ..... **3.**
2. Last maxillar palpomere strongly thickened, in male axe-shaped, in female cask-shaped, on lateral margin of pronotum a few small teeth, elytra with denticle on basal margin ..... ***Thelylankus*** (p. 175).  
-. Last maxillar palpomere normal, lateral margin of pronotum crenulated, elytra without denticle on basal margin ..... ***Anodontelytrus*** (p. 164).
3. Pronotum bare or with sparse, barely perceptible hairs, elytra usually also bare ...  
..... ***Anopsilus*** (p. 165).  
-. Pronotum and usually also elytra covered by distinct hairs ..... **4.**

- 4. Eyes in male very large, swollen, interocular space on frons narrower than width of upper half of eye ..... **Anopsilus** (pars) (p. 165).
- Eyes in male not very large or swollen, interocular space on frons broader than width of upper half of eye ..... **Acolastus** s. str. (p. 148).

Subgenus **Acolastus** s. str.

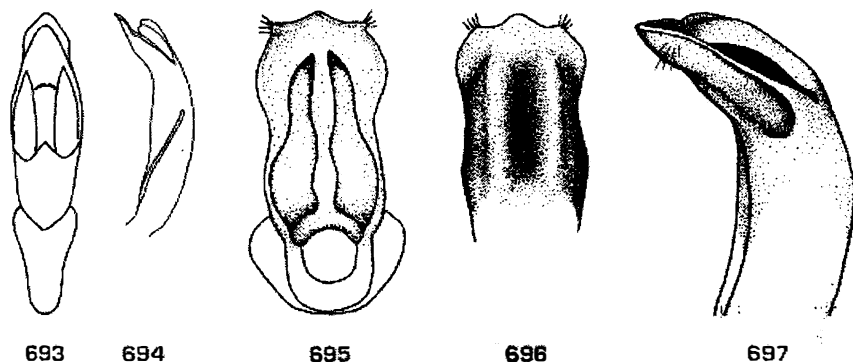
Key to species

- 1. Species from southern China (Sichuan, Yunnan) ..... 2.
- Species from remaining parts of Eurasia ..... 3.
- 2. Elytra covered by simple setae, upper side yellow with black markings along lateral margins of elytra and along suture, as in general view in plate XIX, **phot. 1**. Aedeagus as in figs **686, 687**. Described from S China (Yunnan, Sich ..... **batangensis** (TAN, 1992).
- Elytra covered by short and broad scale-like setae. Antennae long, reaching to basal third of elytra. Elytra yellowish-brown, humerus with a black spot, anterior margin of pronotum yellowish-brown. Aedeagus not studied. Described from Yunnan ..... **albopilosus** (TAN, 1992).
- 3. Upper side black, unicolorous, at most elytra with reddish markings at apex ..... 4.
- Upper side at least partly pale ..... 29.
- 4. Elytra uniformly black ..... 5.
- Elytra with reddish marking at apex ..... 13.
- 5. Upper side densely covered by dense scale-shaped hairs covering the sculpture of surface ..... 6.
- Hairs of upper side not particularly densely scattered, not covering the sculpture of surface ..... 7.



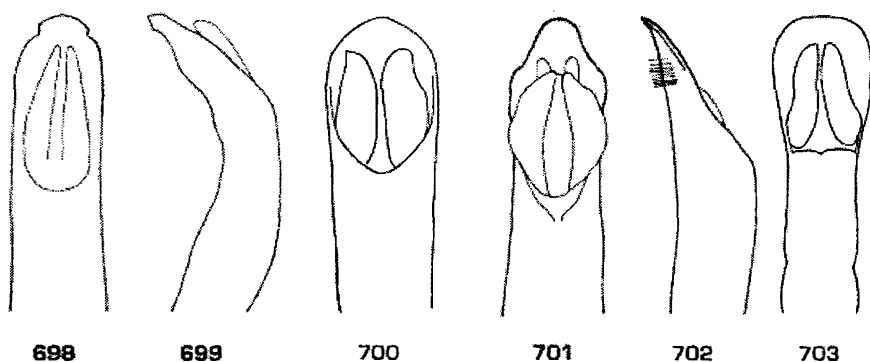
Figs 686-692. Aedeagus in dorsal, ventral and lateral view (686, 687 after SCHÖLLER 2000; 688, 689 after SCHÖLLER and WARCHAŁOWSKI in print; 690-692 after LOPATIN 1992): 686, 687 – *Acolastus (Acolastus) batangensis*; 688, 689 – *A. (A.) velutinus*; 690-692 – *A. (A.) issykensis*.

6. Length of body 3.5–4.0 mm. See *murinus* (thesis 20).
- . Length of body 2.0–2.5 mm. Body black, labrum, antennomeres 2–4 (5–8 also at basis) and legs pale rusty-yellow, claws slightly darkened. Pronotum 1.3 × broader than long, its puncturation very dense, fine and distinct, but visible only on fragments where scales were removed. Elytra about 3 × longer than pronotum, puncturation as dense as on pronotum, but stronger. Aedeagus as in figs 688, 689. Description based on many specimens from Tadzhikistan ..... ***velutinus*** (LOPATIN, 1967a).
7. Aedeagus (figs 690–692) with arch-shaped apex with small triangular extensions before apex. General outline of body and sculpture of upper side as in *badakshanicus* (thesis 21), but elytra uniformly black and shape of aedeagus different. Female not studied. Length 2.5 mm. Described from Kirghyzstan, based on two specimens only ..... ***issykensis*** (LOPATIN, 1992).
- . Aedeagus differently shaped ..... **8.**
8. Pronotum distinctly transverse, at least 1.6 × broader than long. Elytra covered by semierect hairs, their surface coarsely punctured. Legs and antennae black, except for antennomeres 2–4. Body relatively slender, subcylindrical. Aedeagus not studied. Length 2.7 mm. Description based on one male from Kirghyzstan ..... ***lygaeus*** (IABLOKOFF-KHNZORIAN, 1965).
- . Pronotum longer, 1.2–1.4 × broader than long ..... **9.**
9. Legs black, sometimes tarsi brownish only ..... **10.**
- . Legs at least partly brown ..... **13.**
10. Setae on elytra polymorph: short, semiadpressed and considerably longer, semierect. Here forms of *zaissanicus* (thesis 12) with strongly darkened legs.
- . Setae on elytra uniform, thin, semiadpressed, randomly scattered, tibiae and tarsi piceous ..... **11.**
11. Apical part of aedeagus (figs 693, 694) moderately narrowed, its apex rounded. Length 2.5–3.0 mm. Described from E Kazakhstan ..... ***iliensis*** (LOPATIN, 1967a).
- . Apical part of aedeagus (figs 695–697) broadened, apex transversely cut with short and broad lamella. Length 2.3 mm (male) to 2.7 mm (female). Described from SE Kazakhstan based on one couple only ..... ***inopinatus*** (LOPATIN, 1992).



Figs 693–697. Aedeagus indorsal, ventral and lateral view (after LOPATIN 1992): 693, 694 – *Acolastus (Acolastus) iliensis*; 695–697 – *A. (A.) inopinatus*.

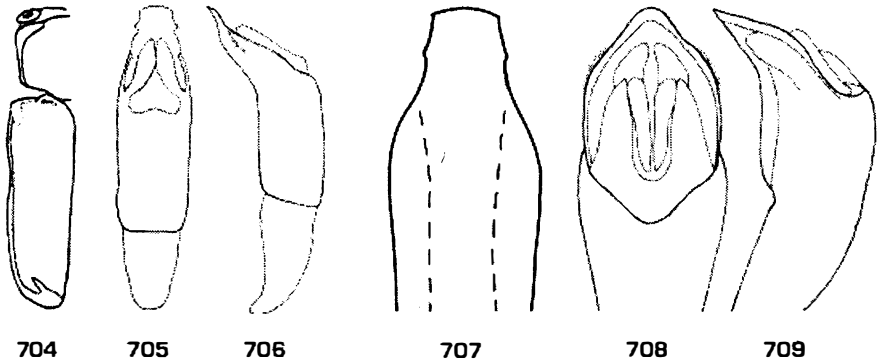
12. Smaller, length 2.0–2.5 mm. Apical part of aedeagus (figs **698**, **699**) in dorsal view with two little lateral angles and obtuse lamella. Legs partly brown, setae on elytra thin, uniform, semiadpressed, randomly scattered. Described from E Kazakhstan ...  
 ..... **zaissanicus** (LOPATIN, 1967).
- . Larger, length 3.2 mm. Body black, upper side deeply black, with barely perceptible metallic reflex, only labrum pale, yellow, in the middle rusty-yellow. Vertex and pronotum covered by dense, coarse, slightly wrinkled puncturation. Pronotum 1.3 × broader than long. Elytra punctured considerably stronger than pronotum. Aedeagus as in fig. **700**. Female unknown. Described from Kirghyzstan (mountains Tian-Shan), based on one male only ..... **anthracinus** (LOPATIN, 1976).
13. Reddish apical marking of elytra prolonged at least on hind part of lateral margin ...  
 ..... **14**.
- . Reddish colour limited to apex of elytra, not prolonged on lateral margin ..... **15**.
14. Puncturation of upper side deep and densely scattered. Apex of aedeagus (figs **701**, **702**) shortly obtuse-rounded, with two weak teeth laterally. Distributed in Tadzhikistan and E Uzbekistan ..... **karakirgiza** (JACOBSON, 1925).
- . Puncturation of upper side dense, but rather shallow. Apical part of aedeagus (fig. **703**) broadened and in dorsal view almost semicircular rounded. Length 2.5–3.0 mm. Described from SW Kazakhstan ..... **nanus** (LOPATIN, 1976).
15. Legs black, tibiae (sometimes also first tarsomere) brownish ..... **16**.
- . Legs rusty-yellow to brownish, femora often with darkening on dorsal side, rarely legs dark brown ..... **26**.
16. Upper side covered by forked setae. Antennae relatively short, hardly reaching hind margin of pronotum. Elytra black with the lateral border and a transverse spot at the apex brown, on anterior margin of pronotum only edges brown. Pale bordering of pronotum and elytra situated as in fig. **704**. Male unknown. Length 3.2 mm. Described from Tibet ..... **furcatus** SCHÖLLER, 2000.
- . Setae or scale-like hairs on upper side not forked ..... **17**.
17. Pronotum and elytra densely covered by whitish hairs ..... **18**.
- . Hairs on upper side not particularly dense ..... **21**.



Figs 698-703. Aedeagus indorsal, ventral and lateral view (698, 699 after LOPATIN 1967; 700 after LOPATIN 1976; 701-703 after LOPATIN 1977): 698, 699 – *Acolastus (Acolastus) zaissanicus*, dorsal and lateral view; 700 – *A. (A.) anthracinus*; 701, 702 – *A. (A.) karakirgiza*; 703 – *A. (A.) nanus*.



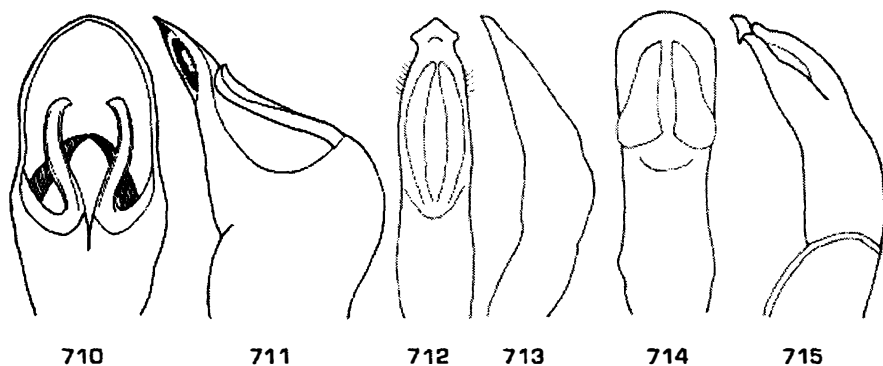
18. Larger, 3.2–4.0 mm, species from Tadzhikistan. Hairs on upper side very dense, covering sculpturation of dorsal surface. Two species similar to each other, distinguishable by aedeagus shape only ..... **20**.
- Smaller, 2.6–3.3 mm, species from Mongolia. Hairs on upper side dense, but not covering sculpturation. Legs black, sometimes knees and tarsi paler, brownish-grey. Pronotum not very broad, approximately 1.5 × broader than long. Elytra about 3.3 × longer than pronotum, strongly punctured, punctures considerably stronger than on pronotum ..... **19**.



Figs 704-709. Aedeagus (704 after SCHÖLLER 2000; 705, 706 after MEDVEDEV and VORONOVA 1977; 707 after MEDVEDEV 1980; 708, 709 after LOPATIN 1977): 704 – *Acolastus (Acolastus) furcatus*; 705, 706 – *A. (A.) atasicu*; 707 – *A. (A.) tsaganicus*; 708, 709 – *A. (A.) murinus*.

19. Aedeagus as in figs **705**, **706**, on its underside median longitudinal ridge distinct, lateral denticles of apex, which are bend downwards, clearly perceptible, larger as in *kaszabi* (thesis 25). Length 2.6–2.9 mm (male) to 3.0–3.3 mm (female). Described from Mongolia (Gobi-Altai distr.) ..... **atasicus** (MEDVEDEV et VORONOVA, 1977).
- All external characters and shape of aedeagus (fig **707**) as in *atasicus* (thesis 19), but median longitudinal ridge on underside of aedeagus feebly developed and lateral longitudinal impressions shallow. Length 2.8 mm (male) to 3.1 mm (female). Described from Mongolia ..... **tsaganicus** (MEDVEDEV, 1980).
20. Aedeagus as in figs **708**, **709**. Length 3.5–4.0 mm. Described from Tadzhikistan ..... **murinus** (LOPATIN, 1961).
- Aedeagus as in figs **710**, **711**. Length 3.2 mm. Described from Tadzhikistan based on one male only ..... **spitameni** (LOPATIN, 1990).
21. Lateral margins of pronotum broad, in hind part slightly denticulate. Hairs on upper side uniform, not very dense and not covering the surface. Lateral margins of pronotum broad, in hind part slightly denticulate. Aedeagus as in figs **712**, **713**. Length 3.0–3.2 mm. Distributed in Tadzhikistan and Afghanistan ..... **badakshanicus** (LOPATIN, 1967a).
- Lateral margins of pronotum narrow, smooth ..... **22**.

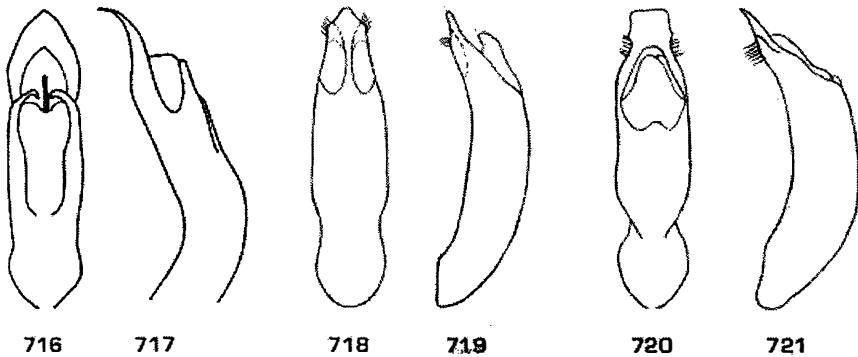
22. Hairs on upper side thin, not uniform, partly short, semiadpressed, partly considerably longer, semierect. General view as in plate XIX, **phot. 64**. Aedeagus as in figs **714, 715**. Length 2.8–3.0 mm. Described from SW Tadjikistan ..... ***atraxidis*** (LOPATIN, 1960).
- . Hairs on upper side short, erect or semierect. Here four species similar to each other, distinguishable only by shape of aedeagus ..... **23**.
23. Aedeagus as in figs **716, 717**. Externally similar to *atraxidis* (thesis 22), differing by shape of aedeagus, more distinct pale marginal stripes on upper side and uniform pubescence. Fore femora in great part brownish, remaining femora at apex, fore tibiae and all first tarsomeres lightened. Length 2.6 mm (male) to 3.1 mm (female). Described from Uzbekistan ..... ***volkovitshi*** (LOPATIN, 1986).
- . Aedeagus differently shaped ..... **24**.



Figs 710-715. Aedeagus in dorsal and lateral view (710, 711 LOPATIN 1990; 712, 713 after LOPATIN 1967; 714, 715 after LOPATIN 1977): 710, 711 – *Acolastus (Acolastus) spitameni*; 712, 713 – *A. (A.) badakshanicus*; 714, 715 – *A. (A.) atraxidis*.

24. Aedeagus as in figs **718, 719**, apex laterally with a small denticle. Externally similar to *aticus* (thesis 19), but hairs on pronotum and elytra considerably more sparsely scattered and aedeagus form different. Length 2.3–2.7 mm (male) to 3.0–3.4 (female). Described from Mongolia (Gobi-Altai distr.) ..... ***altaicus*** (MEDVEDEV et VORONOVA, 1977).
- . Aedeagus differently shaped ..... **25**.
25. Larger, length 3.0–3.5 mm. Apical part of aedeagus (figs **720, 721**) transversely cut, on its underside median longitudinal ridge restricted to very apex, and less distinct as in *aticus* (thesis 19), lateral denticles of apex, which are bend downwards, very small. General outline of body somewhat more stout than in allied species. Described from Mongolia (Chovd distr.) ..... ***kaszabi*** (LOPATIN, 1968b).
- . Smaller, length 2.5–2.7 mm. Only very tip of aedeagus (figs **722, 723**) transversely cut. Described from Mongolia (Gobi-Altai distr.) ..... ***gobicus*** (MEDVEDEV et VORONOVA, 1977).

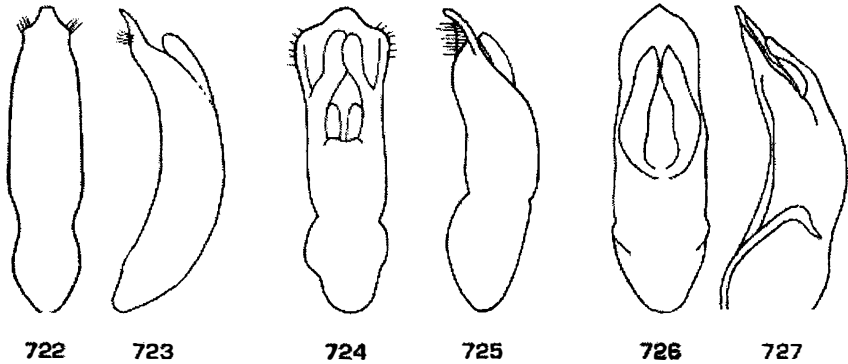
26. Legs entirely rusty-yellow, at most claws and last tarsomeres blackish ..... **27**.  
 -. Legs rusty-yellow with more or less darkened dorsal side of femora and tibiae. Pronotum slightly broader, 1.2–1.3 × broader than long, hairs on upper side shorter ..... **28**.
27. Pronotum almost quadrate, barely 1.2 × broader than long, strongly and densely punctured. Punctures of elytra coarse, distinctly stronger than on pronotum. Hairs on upper side longer, erect. Aedeagus as in figs **724**, **725**. General view as in plate XIX, **phot. 165**. Length 2.5–3.1 mm. Described from Mongolia (Bayan-Khongor distr.) ..... **medvedevi** (LOPATIN, 1977).  
 -. Pronotum about 1.35 × broader than long. Remaining external characters as in *medvedevi* (thesis 27). In male first tarsomeres of fore legs considerably broadened. Female unknown. Aedeagus as in figs **726**, **727**. Length of body 2.7 mm. Described from Kirghyzstan based on two males only ..... **limbatus** (LOPATIN, 1992).



Figs 716-721. Aedeagus in dorsal, ventral and lateral view (716, 717 after LOPATIN 1986; 718, 719 after MEDVEDEV and VORONOVA 1977; 720, 721 after LOPATIN 1968): 716, 717 – *Acolastus (Acolastus) volkovitshi*; 718, 719 – *A. (A.) altaicus*; 720, 721 – *A. (A.) kaszabi*.

28. Aedeagus (figs **728**, **729**) very characteristic, its apical part somewhat fan-shaped. Length 2.6–2.8 mm (male) to 2.8–3.4 mm (female). Described from Mongolia (Kobd distr.) ..... **lopatini** (MEDVEDEV et VORONOVA, 1977).  
 -. Aedeagus in lateral view broad (fig. **731**), its apex transversely cut in dorsal view (fig. **730**), laterally with a pair of small, broad, triangular lamella before apex. Length 2.5 mm (male) to 3.2 mm (female). Described from Kazakhstan (vicinity of lake Balkhash) ..... **balchaschensis** (LOPATIN et KULENOVA, 1982).
29. Punctuation of elytra partly arranged in more or less shortened regular rows, intervals convex, almost ridge-shaped, densely situated in hind part of elytra, each with narrow, yellow dorsal stripe. Here some forms of subgenus *Anopsilus* (see p. 165) with almost bare upper side.  
 -. On elytra no ridges ..... **30**.
30. Pronotum black or dark brown, at most lateral margins and (rarely) anterior margin narrowly yellow ..... **31**.

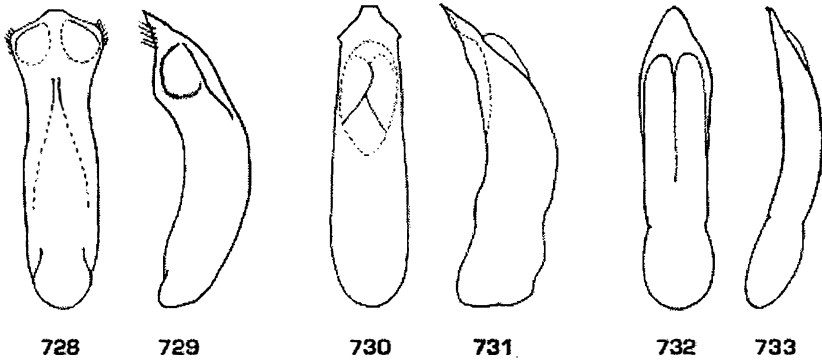
- Pronotum pale, pale with dark pattern or black with distinct yellow margins, in the last case posterior margin at least partly yellowish ..... 39.
- 31. Pronotum uniformly black ..... 32.
- Pronotum black with yellowish or brownish, sometimes shortened, stripe on lateral margin ..... 33.



Figs 722-727. Aedeagus in ventral and lateral view (722, 723 after MEDVEDEV and VORONOVA 1977; 724, 725 after LOPATIN 1977; 726, 727 after LOPATIN 1992): 722, 723 - *Acolastus (Acolastus) gobicus*; 724, 725 - *A. (A.) medvedevi*; 726, 727 - *A. (A.) limbatus*.

- 32. Legs rusty-yellow, elytra rusty-yellow with black humeral spot or with black pattern consisting of a black band at base, two black spots in the middle and one black spot at apex. Apical part of aedeagus (figs 732, 733) gently narrowed, apex rounded. Length 2.7 mm. Described from Tadzhikistan ..... **darvazicus** (LOPATIN, 1975).
- Legs black, apical part of femora, basal part of tibiae and first tarsomere lightened. Elytra black with yellow pattern consisting of narrow basal stripes, anchor-shaped mark before middle, a few longitudinal stripes before apex and lateroapical stripe on margin. General view as in plate I, **phot. 4**. Aedeagus as in figs 734, 735. Very similar to *A. cribripennis* (antithesis 37). General view as in plate XIX, **phot. 166**. Described from Israel based on one specimen only, recorded from Egypt (Sinai), Dead Sea area and Central Negev ..... **furthi** (LOPATIN, 1994).
- 33. Pronotum pitchy, yellow lateral borders enter somewhat on anterior and posterior margins at angles. Head rusty-yellow, vertex and longitudinal stripe on frons black. Elytra dark yellow, humeral spot pitchy; longitudinal stripe behind scutellum and traces of transverse band in hind part consisting of blurred short longitudinal stripes brownish-grey. Legs dark yellow, apices of femora whitish, lobi of third tarsomere and claws brown. Punctuation of elytra deep, random, considerably stronger than on pronotum. Aedeagus as in figs 736, 737, centre of lamella with a transparent "window". Length 2.8 mm. Described from Iran (prov. Beludzhistan), based on one male only ..... **hoberlandti** (LOPATIN, 1980).
- Yellow lateral borders reach angles only, anterior and posterior angles not partly yellow ..... 34.

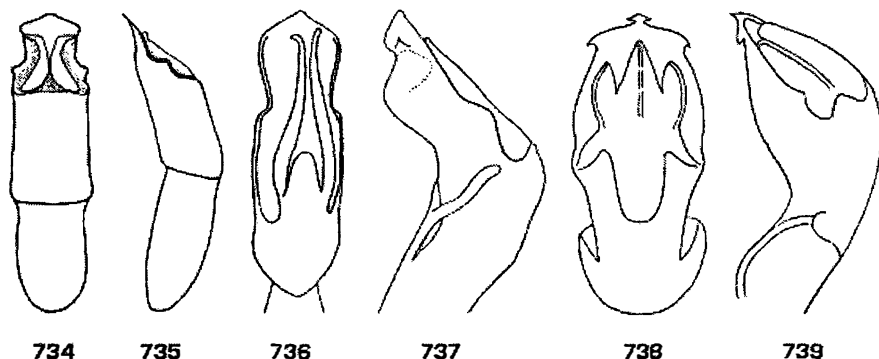
34. Larger species, length of body 3.2 mm (male) to 4.0 mm (female). Externally similar to *nigrifrons* (thesis 49) and *seravschanicus* (thesis 38). Legs except for fore rusty-yellow tibiae black or pitchy black, femora at base and on apex slightly lightened. Each elytron black with three rusty-yellow markings: transverse stripe on anterior margin, short oblique stripe in anterior half and large longitudinal spot on apex. Aedeagus as in figs 738, 739. Described from Tadzhikistan ..... *tatiana*e (LOPATIN, 1983a).
- Smaller species, length of body in female don't exceed 3.2 mm ..... 35.



Figs 728-733. Aedeagus in ventral and lateral view (728, 729 after MEDVEDEV and VORONOVA 1977; 730, 731 after LOPATIN and KULENOVA 1982; 732, 733 after LOPATIN 1975): 728, 729 – *Acolastus (Acolastus) lopatini*; 730, 731 – *A. (A.) balchaschensis*; 732, 733 – *A. (A.) darvazicus*.

35. Legs brown, at least apical part of femora and basal part of tibiae lightened ..... 36.
- Legs black or pitchy black, with pale spots at the end of femora. Elytra black with small rusty-yellow spots, rarely fused into semilunar bands ..... 38.
36. Pubescence of elytra abundant. Pronotum about 1.7 × broader than long, puncturation of its surface strong and dense, but covered by long, whitish, adpressed pubescence. Elytra somewhat stronger punctured than pronotum, covered by pubescence similar as on pronotum. Aedeagus as in figs 740, 741, general view as in fig. 742. Length 2.6 mm. Poorly studied species similar to *A. hoberlandti*, described from S Iran based on one female only ..... *miscellus* (BERTI et RAPILLY, 1973).
- Pubescence of elytra sparse ..... 37.
37. Ground of elytra rusty-yellow with large, common X-shaped brown pattern, consisting of triangular spot on scutellar area connected with transverse band in hind part. Vertex and mid part of frons blackish, rusty-yellowish lateral stripes running along lateral sides of pronotum broadened at anterior angles. Pronotum transverse, 2 × broader than long, covered by very dense and deep punctures and long adpressed hairs, less dense in hind part of disc. Elytra 2.5 × longer than pronotum, covered by coarse punctures and adpressed hairs, shorter than on pronotum. Aedeagus as in figs 743, 744. Length 2.2 mm (male) to 2.6–2.9 mm (female). Described from SW Iran ..... *xsignatus* (LOPATIN, 1985).

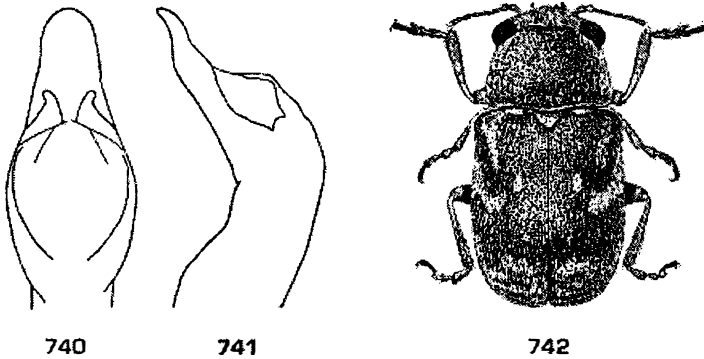
- Elytra brown with pale yellow markings. Yellow colour forms an approximately transverse stripe before midlength of elytra and covers the apical part except for one roundish, brown, preapical spot on each elytron, habitus similar to *A. furthi* (antithesis 32). Aedeagus as in figs 745, 746. Length 2.2 mm (male). Described from Peninsula Sinai, known from three males only ..... ***cribripennis*** (PIC, 1924).
- 38. Body black. Upper side feebly shining, almost matt. Hairs on pronotum not very thin and short. Labrum, narrow lateral margin of pronotum, narrow stripe along anterior margin of elytron and very small spots in the middle of elytron, on sloped apical part and at apex yellowish. Externally rather similar to *nigrifrons* (thesis 49), but smaller and darker coloured. Apex of aedeagus (figs 747, 748) in ventral view incised. Length 2.0–3.2 mm. Described from Tadzhikistan, recorded also from Uzbekistan ...  
..... ***seravschanicus*** (LOPATIN, 1960).
- Colouration of body similar as in *seravschanicus* (thesis 38). Hairs on pronotum very thin and short. Aedeagus as in figs 749, 750. Length 2.5 mm (male) to 3.0 mm (female). Described from Tadzhikistan based on one pair only, recorded also from Kyrgyzstan ..... ***karateginus*** (LOPATIN, 1992).



Figs 734-739. Aedeagus in dorsal and lateral view (734, 735 after SCHÖLLER and HEINIG 2006; 736, 737 after LOPATIN 1980; 738, 739 after LOPATIN 1983): 734, 735 - *Acolastus (Acolastus) furthi*; 736, 737 - *A. (A.) hoberlandti*; 738, 739 - *A. (A.) tatjanae*.

- 39. Frons and lateral sides of pronotum covered by rather thick, adpressed, sometimes even skale-like silvery or white hairs ..... 40.
- Pronotum, also laterally, covered by thin hairs ..... 44
- 40. Upper- and underside covered by very thick, whitish, scale-like hairs, more densely on frons, lateral sides of pronotum and on underside. Pronotum reddish with central large black spot with blurred margins, on elytra brownish pattern as in fig. 751. General view as in plate XIX, phot. 167. Puncturation of elytra fine, very uniform and entirely random. Aedeagus as in figs 752, 753. Length 2.5 mm (male) to 3.4–3.8 mm (female). Described from Saudi Arabia ... ***wittmeri*** (LOPATIN, 1979).
- Hairs on upper side not scale-like ..... 41.
- 41. Externally similar to *wittmeri* (thesis 40), but somewhat paler coloured, smaller, differing mainly by puncturation of elytra arranged in almost regular longitudinal

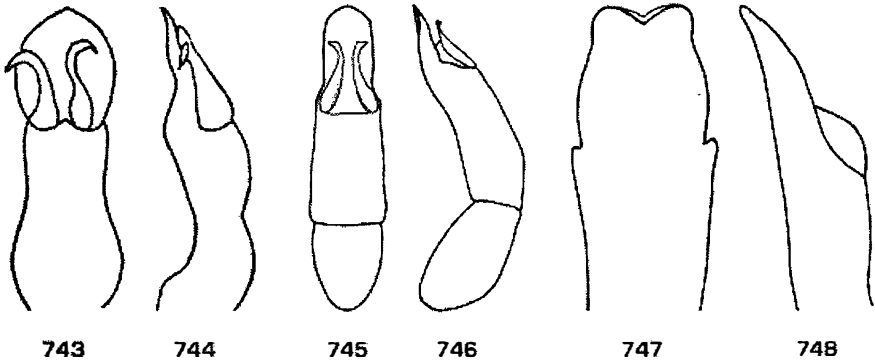
- rows, habitus similar to *A. furthi* (antithesis 32). Aedeagus as in figs 754, 755. Length 2.2 mm (male) to 3.0 mm (female). Described from Oman, recorded also from Saudi Arabia ..... ***substriatus*** (MEDVEDEV, 1996).
- Not as above ..... 42.



Figs 740-742. *Acolastus (Acolastus) miscellus* (740, 741 after LOPATIN 1985; 742 after BERTI and RAPILLY 1973): 740-741 – aedeagus in dorsal and lateral view; 742 – general view.

42. Pattern on elytra sharp, consisting on each elytron of 6 large black spots, usually fused in pairs. Frons and lateral borders of pronotum very densely covered by silvery-white adpressed hairs covering the ground. Pattern on elytra sharp, consisting of 6 large black spots, usually fused into pairs. Hairs on disc of pronotum thick, silvery-white, more loosely scattered than on borders. Aedeagus not studied. Length 3.6–4.6 mm (= *ogloblini* JANKOWSKI, 1932). Described from E Uzbekistan, recorded also from Turkmenistan (Bayram Ali) and Kirghyzstan ..... ***baeckmanni*** (JACOBSON, 1917).
- Pattern on elytra more weakly developed, markings only sometimes fused into pairs, often reduced or absent. Length of body on average smaller ..... 43.
43. Punctures on elytra very dense, deep, in females coarse and somewhat wrinkled. Spots on elytra grey-brown, often partly or entirely disappearing except for humeral spot. Pronotum about 1.5 × broader than long. Elytra yellow, sutural margin narrowly and usually in apical half black only, on each elytron humeral spot and four very small black spots or dots (2, 2). General view as in plate XIX, **phot. 168**. Aedeagus as in figs 756, 757. Length 2.9–3.8 mm. Variations: discal spots on elytra partly or entirely disappearing (ab. *armeniacus* PIC, 1906), humeral spot A-shaped (ab. *nigronotatus* PIC, 1906). Distributed in Turkmenistan, Armenia, Azerbaidzhan and N Iran ..... ***fausti*** (WEISE, 1882).
- Punctures of elytra finer, never coarsely-wrinkled. Elytral pattern consisting of small brownish spots at humeral callus and near apex. Aedeagus as in figs 758, 759. Length 3.2–3.6 mm. Forms two subspecies: punctures of elytra deep, very slightly wrinkled, dark pattern on elytra not very distinct, but perceptible (nominotypical subspecies); punctures of elytra more shallow, never wrinkled, elytra pale unicolorous (subsp.

- bergi* JACOBSON, 1917, general view as in plate XIX, **phot. 169**). Distributed in E Kazakhstan and in NW China ..... *regeli* (JACOBSON, 1898).
44. Head pale ..... 45.  
 -. Head at least partly black ..... 46.

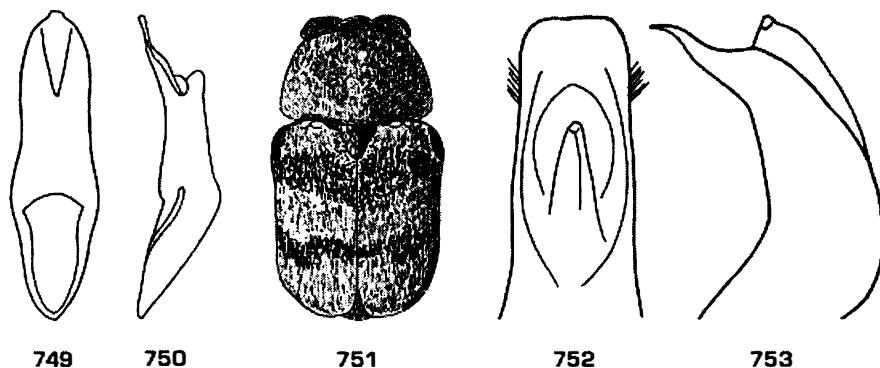


Figs 743-748. Aedeagus in dorsal and lateral view (743, 744 after LOPATIN 1985; 745, 746 after SCHÖLLER and HEINIG 2006; 747, 749 after LOPATIN 1960): 743, 744 - *Acolastus (Acolastus) x-signatus*; 745, 746 - *A. (A.) cribripennis*; 747, 748 - *A. (A.) serauschanicus*.

45. Body brownish yellow. Labrum, middle of clypeus, lateral borders of pronotum, basal margin of elytra, two transverse elytral bands and their apex pale yellow. Legs dark yellow, apices of femora pale yellow. Pronotum finely, elytra considerably stronger punctured, on each elytron three fine costae. Male unknown. Length 3.0 mm. Described from Afghanistan, based on two females .... ***ochraceus*** (LOPATIN, 1966).
- . Body rusty-yellow, scutellum blackish. Interocular space relatively narrow, not broader than eye. Pronotum 1.7-1.8 × broader than long, its puncturation dense and deep, interstices as broad as diameter of punctures. Hairs on pronotum semiadpressed, rather long and moderately densely scattered. Teeth on basal thickening of elytra large, sharpened. Aedeagus as in figs 760, 761. Length about 2.6 mm. Described from S Iran ..... ***rufus*** (LOPATIN, 1980).
46. Frons black, rarely with two small, not always well-visible reddish dots ..... 47.  
 -. Frons black with two distinct, large, pale spots ..... 54.
47. Elytra covered by long, relatively densely scattered semiadpressed hairs, similar to hairs on pronotum ..... 48.  
 -. Hairs on elytra short, erect, considerably shorter than on pronotum. Puncturation of elytra partly (especially in hind half, parallel to suture) arranged in semiregular longitudinal rows ..... 50.
48. Black pattern on elytra fused into two transverse bands (basal and postmedian), connected by broad, longitudinal sutural stripe. Yellow pattern consist of two spots: anterior semilunar or horseshoe-shaped, posterior covering apical part, both spots connected by pale stripe running along lateral margin ..... 49.



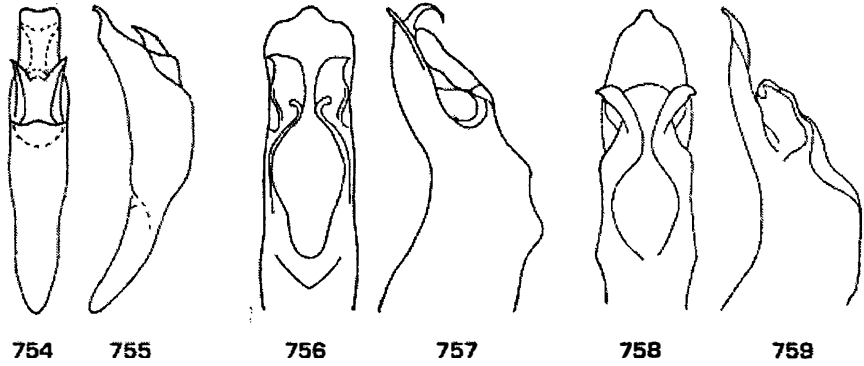
- Elytra black with a large horseshoe-shaped spot on anterior half of elytra and with wavy stripe on apical border. Pronotum black, around bordered with rusty-yellow. Aedeagus as in figs 762–764. Length 2.7–3.0 mm. Described from Tadzhikistan ....  
..... **mogoltavicus** (LOPATIN, 1992).



Figs 749-753 (749, 750 after LOPATIN 1992; 751, 752 after LOPATIN 1979): 749, 750 – *Acolastus (Acolastus) karateginus*, aedeagus in ventral and lateral view, 751-753 – *A. (A.) wittmeri*: 751 – dorsal side, 752, 753 – aedeagus in dorsal and lateral view.

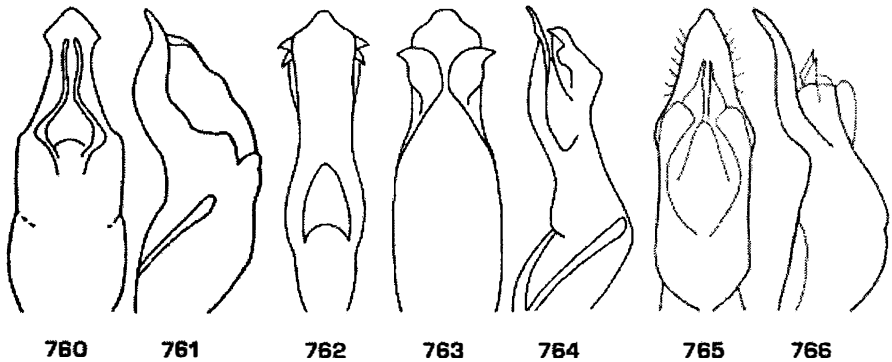
- 49. Elytral pubescence more densely scattered, margins of pale elytral pattern slightly blurred. General view as in plate XIX **phot.170**. Aedeagus as in figs 765, 766. Length 3.1–4.0 mm. Distributed in Tadzhikistan ..... **nigrifrons** (JACOBSON, 1917).
- Elytral pubescence more sparsely scattered, margins of pale elytral pattern more sharp. Aedeagus as in figs 767, 768. Length 3.3–4.1 mm. Distributed in Tadzhikistan. It isn't possible to expel the conspecificity *mogoltavicus* = *shahristanus*; different outlines in dorsal view of aedeagus (figs 762, 767) may be caused by different drawing manner ..... **shahristanus** (LOPATIN, 1987a).
- 50. Body more stout ..... **51**.
- Body more slender, 2 × longer than broad ..... **52**.
- 51. Puncturation of pronotum fine, interstices larger than diameter of punctures. Lateral margin of pronotum broad, slightly bend up. In both sexes disc of pronotum before hind margin always without brownish spots. Body black. On frons two very small, barely perceptible reddish dots, on clypeus small longitudinal reddish stripe. Pronotum black, around dark rusty-yellowish margined, yellow margin slightly but distinctly broadened at anterior angles. Elytra rusty-yellow with horseshoe-shaped spot on humerus, narrow black sutural stripe and black transverse band in hind part black. Legs entirely pale, rusty-yellow, apices of femora with whitish spot. Aedeagus as in figs 769, 770. Length 3.0–4.0 mm. Distributed in Tadzhikistan .....  
..... **intermedius** (LOPATIN, 1968a).
- Puncturation of pronotum strong, pale lateral margin of pronotum narrow. Colouration of elytra in general similar as in *intermedius* but generally darker.

Aedeagus as in figs 771, 772. Female unknown. Length 3.3 mm. Described from Tadzhikistan based on one male only ..... ***kuramensis*** (LOPATIN, 1997).



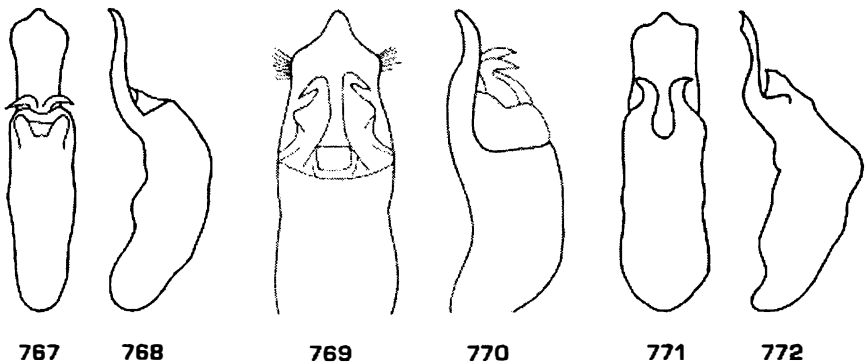
Figs 754-759. Aedeagus in dorsal and lateral view (754, 755 after MEDVEDEV 1996, remaining after LOPATIN 1977): 754, 755 – *Acolastus (Acolastus) substriatus*; 756, 757 – *A. (A.) fausti*; 758, 759 – *A. (A.) regeli*.

52. Length of body less than 3.0 mm ..... 53.  
 -. Length of body more than 3.0 mm. Pronotum black between yellowish borders. Elytra rusty-yellow with blackish spot behind humeral callus. Underside black, anal sternite and pygidium yellowish bordered at apical margin. Aedeagus as in figs 773, 774. Length 3.3 mm (male) to 4.1–4.2 mm (female). Described from SE Georgia ..... ***georgicus*** (LOPATIN, 1986).



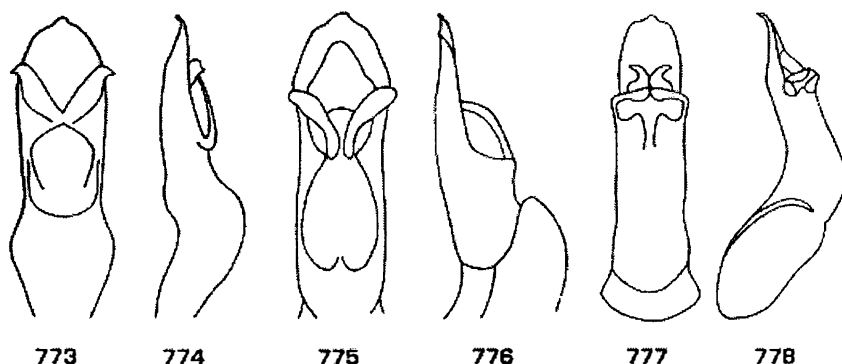
Figs 760-766. Aedeagus indorsal, ventral and lateral view (760, 761 after LOPATIN 1980; 762-764 after LOPATIN 1992; 765, 766 after LOPATIN 1977): 760, 761 – *Acolastus (Acolastus) rufus*; 762-764 – *A. (A.) mogoltavicus*; 765, 766 – *A. (A.) nigrifrons*.

53. Elytra usually uniformly yellowish, more rarely with small humeral spot or additionally with other dark pattern. Head and pronotum covered by long, whitish, adpressed hairs, on elytra hairs short, semierect, uniformly, not very densely scattered. Head black, pronotum black, yellowish bordered, scutellum black. General view as in plate XIX, **phot. 171**. Aedeagus as in figs 775, 776. Length 2.7–2.9 mm. Distributed in E Uzbekistan (lowland of Ferghana) ..... **ivanovi** (JACOBSON, 1925).
- Elytra yellowish with elongate black humeral spot and in hind part with broad black band consisting of several short, fused longitudinal stripes. Aedeagus as in figs 777, 778. Length 2.0 mm (male) to 2.5 mm (female). Described from Azerbeidzhan, based on one couple only ..... **gobustanus** (LOPATIN, 1992).
54. Puncturation of pronotum wrinkled, on elytra here and there wrinkle-shaped interstices fused into punctured convexities. Elytra yellow, humeral spot, shortened postscutellar, complete postmedian band and ragged preapical spot blackish, connected together by blackish sutural stripe. Length 3.0 mm. Described from S Iran (Kerman) based on one female only, aedeagus as in figs 779, 780 ..... **semenovi** (JACOBSON, 1917).
- Pronotum more or less strongly punctured but not rugose, elytra without fused wrinkles ..... **55**.
55. Large species, length of female 4.8 mm. On pronotum large M-shaped dark pattern. Head black with yellow spots, scutellum black with pale apex, remaining parts of upper side pale rusty-yellow. Punctures on elytra brown. Legs dark yellow, femora on underside whitish-yellow, last tarsomeres and claws pitchy brown. Pronotum 1.6 × broader than long, densely, deeply, finely punctured. Hairs on pronotum fine, adpressed, rather short, sparsely scattered. Puncturation of elytra random, considerably stronger and more loosely scattered than on pronotum. Interstices somewhat convex, secondary puncturation very fine and sparse, but perceptible. Aedeagus as in figs 781, 782. Described from Mongolia (prov. Bayankhongor) based on one female only ..... **mongolicus** (LOPATIN, 1971).
- Smaller species, length of female at most 4.0 mm ..... **56**.



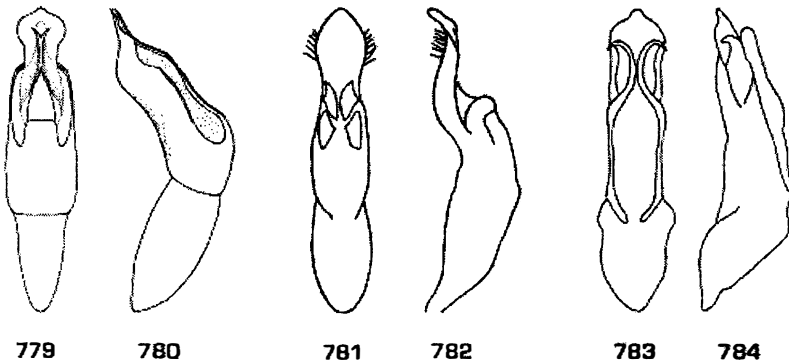
Figs 767-772. Aedeagus in dorsal and lateral view (767, 768 after LOPATIN 1987; 769, 770 after LOPATIN 1968; 771, 772 after LOPATIN 1997): 767, 768 - *Acolastus (Acolastus) shahristanus*; 769, 770 - *A. (A.) intermedius*; 771, 772 - *A. (A.) kuramensis*.

56. Upper side pale yellow. Head black with large, sharp and distinct yellow spots on frons and clypeus. Pronotum with large black M-shaped pattern. Scutellum black with pale apex, covered by pubescence. Each elytron with black humeral spot and four small black spots (sometimes fused in one horseshoe-shaped spot) in hind part.
57. Legs pale with darkened last tarsomeres and claws. Aedeagus as in figs 783, 784. Length 2.7–3.0 mm (male) to 3.5–3.6 mm (female). Described from E Turkmenistan ..... *margaritae* (LOPATIN, 1997).
- . Colouration of body similar as in *margaritae* (thesis 56), but pattern on pronotum less distinct. Shape of aedeagus different ..... 57.
57. Puncturation of elytra partly arranged in longitudinal rows. Clypeus and frons with rather small pale spots, vertex black. Upper side feebly shining, almost matt, ground yellow-ochre, pattern on elytra black. Pronotum black with rusty-reddish borders or rusty-yellow with blackish M-shaped pattern. Elytra rusty-yellow with black pattern consisting on each elytron of an A-shaped spot on humeral callus, large, elongate lateral spot and small roundish spot in apical part. Two species similar to each other, distinguishable by shape of aedeagus only and differently distributed ..... 58.
- . Puncturation of elytra random ..... 59.
58. On average somewhat larger. Length 3.0–4.0 mm. Aedeagus as in fig. 785. Distributed in Turkmenistan ..... *khnzoriani* (LOPATIN, 1975).
- . On average somewhat smaller, length 2.5 mm (male) to 3.3–3.5 mm (female). Aedeagus as in figs 787, 788. Described from Kirghyzstan ... *przevalskii* (LOPATIN, 1992).
59. Puncturation on elytra rather shallow, here and there smoothed. Black, shining, sparsely covered by hairs. Labrum, three spots on head, margins of pronotum and two longitudinal spots at its hind margin yellow. On each elytron six small, blurred, pitchy or brown separated spots. Aedeagus as in fig. 786. Length 3.5–3.8 mm. Distributed in Kazakhstan, Uzbekistan and Tadzhikistan ..... *karatavicus* (LOPATIN, 1976).
- . Puncturation on elytra everywhere deep, often wrinkled, on central part of disc sometimes finer, but always deep and distinct ..... 60.



Figs 773–778. Aedeagus in dorsal and lateral view (773, 774 after LOPATIN 1986; 775, 776 after LOPATIN 1977; 777, 778 after LOPATIN 1992): 773, 774 – *Acolastus (Acolastus) georgicus*; 775, 776 – *A. (A.) ivanovi*; 777, 778 – *A. (A.) gobustanus*.

60. Larger (length of body in male over 3.2 mm, female up to 4.0 mm) ..... **61.**  
 -. Smaller (length of body in male under 3.0 mm, female up to 3.5 mm) ..... **62.**

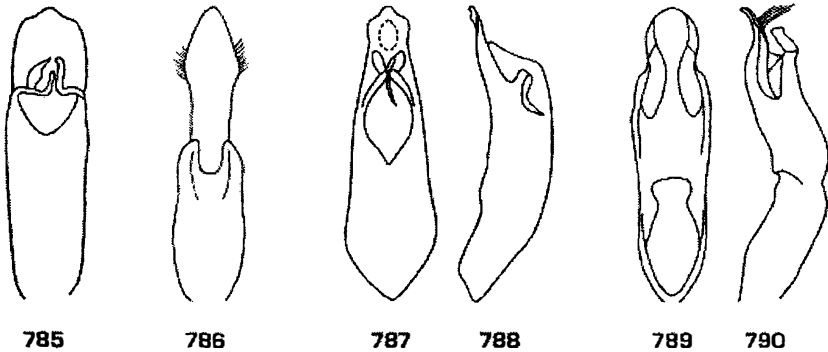


Figs 779-784. Aedeagus in dorsal and lateral view (779, 780 after SCHÖLLER and WARCHALOWSKI in print; 781, 782 after LOPATIN 1971; 783, 784 after LOPATIN 1997): 779, 780 - *Acolastus (Acolastus) semenovi*; 781, 782 - *A. (A.) mongolicus*; 783, 784 - *A. (A.) margaritae*.

61. Dark pattern of upper side entirely disappearing or on each elytron separate small, brown spots (on humeral callus, behind midlength and in apical part at suture). Primary punctures of elytra darkened, brownish grey. Pronotum also entirely pale or with M-shaped dark brown spot. Legs rusty-yellow, on underside lightened. Pronotum 1.6 × broader than long, its puncturation in central part of disc distinctly finer. Apical part of aedeagus (figs **789**, **790**) rounded, gently narrowing towards base. Length 3.2-4.0 mm. Distributed in E Kazakhstan .....  
 ..... ***dzhungarus*** (LOPATIN, 1976).
- . On pronotum M-shaped pattern black, well-developed. Elytra pale, rarely with two small dark spots in hind half near suture. Apical part of aedeagus (figs **791**, **792**) at its base sharply narrowing, apex elongate, pointed. Length 3.3 mm (male) to 4.0 mm (female). Described from Uzbekistan (mountains Nuratau) .....  
 ..... ***nuratavicus*** (LOPATIN, 1992).
62. Pale spots on frons broadly distant, very small, dark rusty-yellow. See *intermedius* (thesis 51).
- . Pale spots on frons oblique, closely situated, sometimes connected, dark yellow, often very large ..... **63.**
63. Upper side dark yellow with black spots. On pronotum black or pitchy-brown M-shaped pattern. Setae on elytra long, erect, relatively dense. Aedeagus as in figs **793**, **794**. Length about 3.0 mm. Described from SW Tadjikistan .....  
 ..... ***tadzhicus*** (LOPATIN, 1968a).
- . Upper side pale yellow with black pattern. Setae on elytra short and sparsely scattered. Pronotum distinctly, finely and densely punctured, covered by thin, adpressed hairs. General view as in plate XX, **phot. 172**. Aedeagus as in figs **795**, **796**. Length 2.5-3.5 mm (= *confluens* WEISE, 1887). Distributed in Kirghyzstan and Kazakhstan .....  
 ..... ***hauseri*** (WEISE, 1887).

Key to species

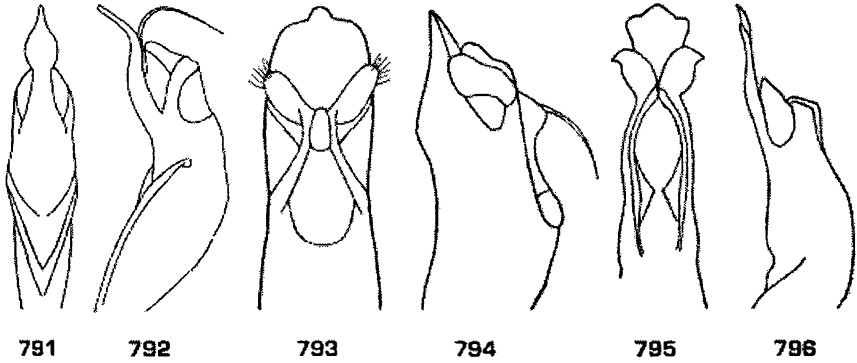
1. Dorsum black, legs reddish-brown. On each elytron at apex a small, transverse reddish stripe. Antennae short, antennomeres 3 and 4 thin, of equal length. Puncturation of pronotum distinct, fine, interstices distinctly larger than diameter of punctures. Elytra without tooth on basal margin, strongly and densely punctured, punctures considerably larger than on pronotum, interstices narrow, rugose. Setae on elytra scale-like, densely scattered, adpressed, covering surface of elytra. Aedeagus published as in figs 797, 798, insufficiently studied. Described from Iran (Beludshistan) ..... *mirandus* (LOPATIN, 1980).
- . Dorsum entirely or in great part pale, yellowish or brownish ..... 2.



Figs 785-790. Aedeagus in dorsal and lateral view (785 after LOPATIN 1976; 786 after LOPATIN 1976; 787-780 after LOPATIN 1992): 785 - *Acolastus (Acolastus) khnzoriani*; 786 - *A. (A.) karatavicu*; 787, 788 - *A. (A.) przewalskii*; 789, 790 - *A. (A.) dzhungarus*.

2. Ventral side pale reddish yellow. Pronotum and elytra almost bare, with very sparse, barely perceptible hairs, interstices rugose, here and there with distinct small convexities. Upper side pale testaceous, with whitish rugosities, indistinctly brownish marked. General view as in plate XX, **phot. 173**. Aedeagus as in figs 799, 800. Length 2.0-2.5 mm. Variation: brown markings on upper side dark, very distinct (ab. *leopardinus* CHUBAUT, 1899). Distributed in Algeria and Tunisia ..... *caroli* (MARSEUL, 1884).
- . Ventral side at least partly black or blackish ..... 3.
3. Dorsal side granulate (covered by small callosities, see plate III, **phot. 11**) ..... 4.
- . Dorsal side without granulation ..... 5.
4. Elytra covered by ribs and elevated markings, denticles on lateral margins of pronotum enlarged posterad. Body yellowish with rusty-red pattern. On pronotum two transversely-oblique stripes, elytra rusty-red with yellowish borders and yellowish central spot on each. Length 3.3-3.5 mm. Male unknown. Described from Saudi Arabia, reported also from Jordan ..... *buettikeri* (LOPATIN, 1983).

- Elytra densely covered by small, smooth, pale yellowish tubercles, remaining surface and puncturation reddish brown. General view as in plate XX, **phot. 174**. Aedeagus as in figs **801, 802**. Length 2.8–3.5 mm. Known from Morocco only .....  
..... **granulatus** (BERTI et DOGUET, 1994).



Figs 791-796. Aedeagus in dorsal and lateral view (791, 792 after LOPATIN 1992; 793, 794 after LOPATIN 1968; 795, 796 after LOPATIN 1977): 791, 792 – *Acolastus (Acolastus) nuratavicus*; 793, 794 – *A. (A.) tadjhicus*; 795, 796 – *A. (A.) hauseri*.

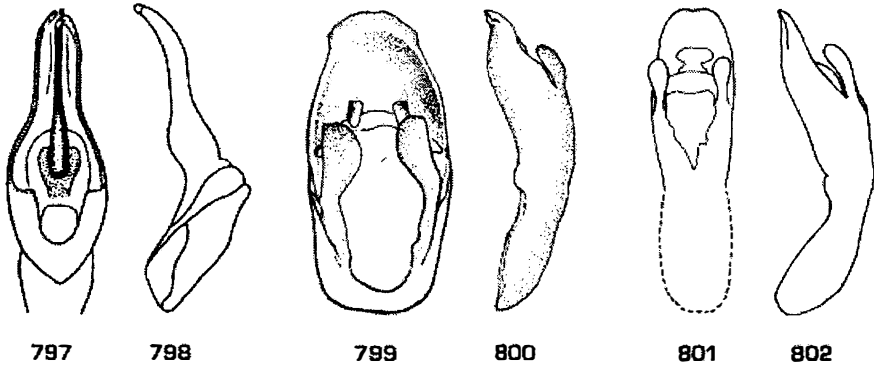
- 5. W Mediterranean species. Dorsal side pale yellowish with large reddish brown spots, rugose. Externally similar to *caroli* ab. *leopardinus* (thesis 2), but ventral side darker coloured and body length on average larger. Aedeagus as in figs **803, 804**. Length 3.5–4.0 mm. Known from Algeria only ..... **brunneomaculatus** (PIC, 1896).
- Species from Saudi Arabia. Dark brownish-yellow, apices of elytra, a few blurred spots on pronotum and basal part of antenna paler. Underside, except for last abdominal segment black. Aedeagus as in figs **805, 806**. Length 2.4 mm. General view as in plate XX, **phot. 175**. Description based on one specimen only :.....  
..... **denticulatus** (MEDVEDEV, 1996).

Subgenus **Anopsilus** JACOBSON, 1917

Key to species

- 1. Mediterranean species, distributed in N Africa ..... **2.**
- Asiatic species, distributed eastwards of Egypt ..... **4.**
- 2. Pygidium pale ..... **3.**
- Pygidium black with yellowish border. Pronotum relatively broad, ratio length/width about 1.8. Upper side pale, on pronotum and elytra sometimes blurred darkenings. Length 2.7–3.2 mm (= *deletus* CHOBAUT, 1899, *multinotatus* PIC, 1906). Aedeagus as in figs **807, 808**. Described from Tunisia, known also from Algeria .....  
..... **apicenotatus** (CHOBAUT, 1899).

3. Length 2.3–2.8 mm (= *curtus* LOPATIN, 1994). Upper side straw yellow, frons and vertex blackish, with (if always?) two reddish or reddish-brown oblique spots. In some specimens on hind part of elytra a few weak longitudinal costae are present. Aedeagus as in figs **809**, **810**. Described from Egypt, distributed on a rather large area in Tchad, Sudan, Algeria, Egypt and Israel ..... ***praeivius*** (SUFFRIAN, 1857).
- . Length about 2.0 mm (= *cardui* PIC, 1896, *tuniseus*, PIC, 1900). Elytra without (if always?) traces of costae. Colouration of body as in *praeivius* (thesis 3), aedeagus (figs **811**, **812**) also very similarly shaped. Described from Algeria, also recorded from Tunisia, perhaps conspecific with *praeivius* ..... ***theryi*** (CHOBOUT, 1896).

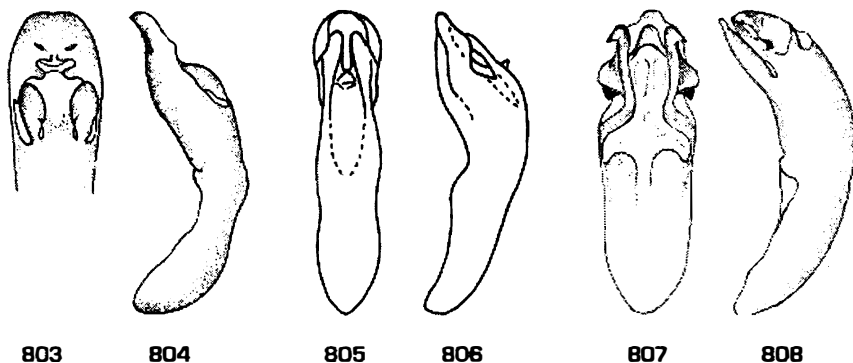


Figs 797-802. Aedeagus in dorsal and lateral view (797, 798 after LOPATIN 1980; remaining after BERTI and DOGUET 1994): 797, 798 – *Acolastus (Anodontelytrus) mirandus*; 799, 800 – *A. (A.) caroli*; 801, 802 – *A. (A.) granulatus*.

4. Species from India. Body length to 5.9 mm ..... **28**.
- . Species from remaining parts of discussed area; body length only in female *glabratus* (thesis 9) and *zarudnyi* (thesis 10) may exceed 5.0 mm, in other species at maximum 4.0 mm ..... **5**.
5. Eyes in male larger than in female, swollen, interocular space narrower than eye width (fig. **813**) ..... **6**.
- . Eyes in male normal, as in female, interocular space broader than eye width ... **10**.
6. Elytra with erect or semierect hairs ..... **7**.
- . Elytra bare. A difficult group of species distributed in E Turkey, Transcaucasia and Iran, even the lamella of the aedeagus is variable in width and in the shape of its lateral teeth, usually males are pale and dorsum of females with light brown to blackish brown pattern; the species require further studies ..... **8**.
7. On elytra blackish pattern (fig. **814**). Apical part of aedeagus (figs **815**, **816**) narrowed, laterally rounded and basally constricted. Length 3.8 mm (male) to 4.9 mm (female). Described from Oman, translocated to Trinidad..... ***arabicus*** (LOPATIN, 1982).
- . Upper side uniformly pale except for blackish stripe on frons and black scutellum. Underside black except for borders of anal sternite and pygidium. Pronotum covered

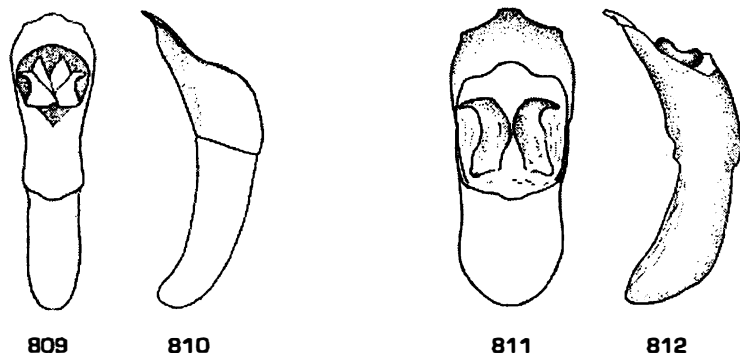


by thin, relatively long, adpressed hairs. Aedeagus as in figs **817**, **818**. Length 3.0 mm. Described from S Iran, based on one male only .....  
 ..... ***ophthalmicus*** (LOPATIN, 1997).



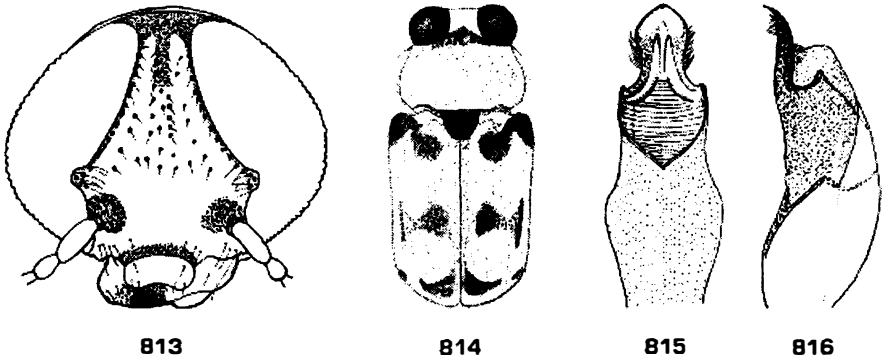
Figs 803-808. Aedeagus in dorsal and lateral view (805, 806 after MEDVEDEV 1996; remaining after BERTI and DOGUET 1994): 803, 804 – *Acolastus (Anodontelytrus) brunneomaculatus*; 805, 806 – *A. (A.) denticulatus*; 807, 808 – *A. (A.) (Anopsilus) apicenotatus*.

8. Lamella, i. e. ventral prolongation of aedeagus bulked out in lateral view, i. e. prominent ..... **9**.  
 -. Aedeagus almost straight in lateral view, apex of aedeagus triangular with three tips (figs **822**, **823**), elytra with or without blackish pattern. On pronotum sometimes three blurred brownish darkenings or spots. General outline of body as in *zarudnyi* (thesis 10). Length 3.0–5.5 mm. Described from SW Iran, also recorded from Turkey ..... ***glabratus*** (LOPATIN, 1985).



Figs 809-812. Aedeagus in dorsal and lateral view (809, 810 after SCHÖLLER and HEINIG 2006; 811, 812 after BERTI and DOGUET 1994): 809, 810 – *A. (A.) praeivius*, 811, 812 – *A. (A.) theryi*.

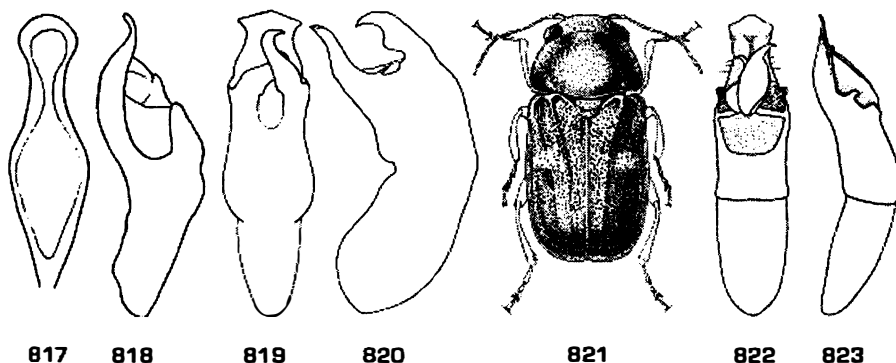
9. Apex of aedeagus narrow (figs 139, 140). Pronotum unicolorous or with indistinct blurred darkening. On each elytron six blackish spots (2, 2, 2), somewhat blurred and often fused into transverse bands. This species, similarly as *arabicus* (thesis 6) and *glabratus* (thesis 8), is characterized by a great sexual dimorphism. Males are considerably smaller, with longer legs and with less developed black markings of upper side. General view as in plate XX, **phot. 176** (male) and **177** (female). Length 3.2–4.0 mm (male) to 4.0–5.0 mm (female). Distributed in SW and S Iran and Afghanistan ..... **zarudnyi** (JACOBSON, 1917).
- . Apex of aedeagus wider, as wide as base (figs 819, 820). Body almost entirely blackish brown, except for labrum and two brownish-yellow spots on each elytron. On each elytron three longitudinal costae, first lateral, starting from humeral callus, the second starting from basal callosity and the third, more weak, median. Outline of body as in figs 136, general view as in plate XX, **phot. 179**. Length 2.6 mm (male) to 3.3 mm (female). Described from Iran ..... **lugubris** (BERTI et RAPILLY, 1973).



Figs 813-816. *Acolastus (Anopsilus) arabicus* (after LOPATIN 1982): 813 – head; 814 – upper side; 815, 816 – aedeagus in dorsal and lateral view.

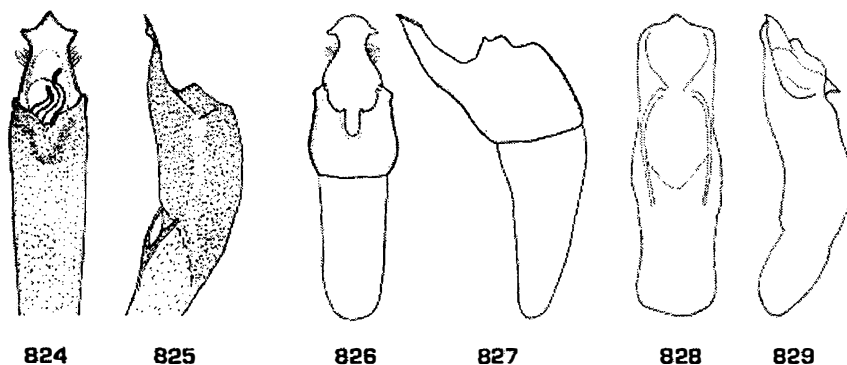
10. Pronotum black or dark brown, at most lateral margins and (rarely) anterior margin narrowly yellow ..... **11**.
- . Pronotum pale, pale with dark pattern or black with yellow margins, in the last case posterior margin at least partly yellowish ..... **13**.
11. Upper side black, on each elytron two pale transverse stripes. Anterior stripe, before the midlength of elytra, reaches to lateral margin, but is interrupted on suture. The posterior stripe covers apical part of elytra. All femora black, tibiae and tarsi yellow ochre, tarsi somewhat darkened. General view as in plate XX, **phot. 178**. Apex of aedeagus (figs 826, 827) rounded, apical part triangular. Length 3.3 mm. Described from N Iran, known from holotype only ..... **pici** (LOPATIN, 1985).
- . Not as above ..... **12**.
12. Elytra black with yellowish anterior margin and two pale spots on each. Upper side deeply black, shining; labrum, small spot on clypeus, two oval spots on frons, lateral margins of pronotum and anterior margin of elytra yellow. On each elytron

- one semilunar spot in anterior half and one large, elongate spot on apical part. Pronotum 1.4 × broader than long, its puncturation shallow, moderately dense, interstices broader than diameter of punctures. Hairs on pronotum present, but very thin and sparse, adpressed, barely perceptible. Elytra 2 × longer than pronotum, rather heterogeneous punctured. Aedeagus as in figs 828, 829. Length 2.9–3.2 mm. Described from Tadzhikistan ..... *tadzhibajevi* (LOPATIN, 1975).
- Elytra pale with blackish humeral spot and blackened puncturation. Body short and broad, upper side bare except for head and scutellum. Head black, labrum, clypeus and two oblique spots on frons reddish yellow. Antennae blackish, antennomeres 1 and 2 partly, 3 and 4 entirely reddish. Pronotum dark brown with partly rusty margins, scutellum, except for its apex, black. Pygidium black with pale apical margin. Legs black, apices of femora and tibiae except their middle rusty-yellow. Apex of aedeagus (figs 831, 832) narrowly rounded, behind apical part narrowed, too. Length 3.3–3.4 mm. Described from Iran, based on one couple only, recorded also from Turkey ..... *iranicus* (LOPATIN, 1980).
  - 13. On each elytron two distinct longitudinal ridges: a sharp lateral ridge running from humerus to apex, and another shorter, more feeble one. Puncturation of elytra entirely random. Head black with pale anterior part, pronotum pale with one blackish spot before scutellum and with one spot on each side. Elytron pale, longitudinal stripe along lateral margin, elongate spot on apical part near suture and punctures blackish. Legs pale with darkened last tarsomeres and claws. Length 3.7 mm. Male unknown. Described from Nepal based on one female only ...  
..... *costatus* (MEDVEDEV et SPRECHER-UEBERSACHS, 1999).
  - Elytra without ridges ..... 14.
  - 14. Hairs on elytra very short, erect, sparsely scattered, sometimes almost entirely absent. Puncturation of pronotum stronger, often almost as strong as on elytra .... 15.
  - Hairs on elytra longer, semiadpressed or adpressed. Primary puncturation on pronotum much finer than on elytra ..... 25.



Figs 817-823 (817, 818 after LOPATIN 1997; 819-821 after BERTI and RAPILLY 1973; 822, 823 after SCHÖLLER and HEINIG 2006): 817, 818 – *Acolastus (Anopsilus) ophthalmicus*, aedeagus in ventral and lateral view; 819, 820 – *A. (A.) lugubris*, idem; 821 – *A. (A.) lugubris*, general view; 822, 823 – *A. (A.) glabratus*, aedeagus in dorsal and lateral view.

15. Primary punctures on pronotum shallow. Upper side pale ..... 16.  
 - Primary punctures on pronotum deep, moderately strong to strong ..... 17.
16. Pronotum short and broad, over 2 × broader than long, pale testaceous, on pronotum blurred brownish pattern (3-5 spots), on elytron a darker spot behind humerus. Femora uniformly pale. Basal margin of pronotum before scutellum thickened and somewhat elevated. Length 2.9-4.0 mm. Aedeagus (figs 832, 833) narrowed behind apical part, its apex with large and broad lamella. Forms two subspecies: colouration of body and shape of aedeagus as above (nominotypical subspecies); dark pattern on upper side more distinct, elytral suture and the posthumeral spot brown or blackish, aedeagus similar as in nominotypical subspecies, but generally narrower and its apex in lateral view only weakly bend down (subsp. *montanus* LOPATIN, 1976). Distributed in E Uzbekistan, NW Tadzhikistan (nominotypical subspecies) and in E Tadzhikistan (subsp. *montanus*) ..... *pallidus* LOPATIN, 1956.
- Pronotum considerably longer, 1.5-1.6 × broader than long. Remaining external characters similar as in *pallidus* (thesis 16), aedeagus as in figs 834, 835. Length 3.0-3.2 mm (male) to 3.5-3.6 mm (female). Variations: upper side entirely pale (typical form), on head and pronotum blackish marking, suture dark brown, on each elytron two dark spots, one near humeral callus, another at apex (dark form, unnamed). Distributed in Tadzhikistan and S Uzbekistan ..... *sogdianus* (LOPATIN, 1992).



Figs 824-829. Aedeagus in dorsal and lateral view (824, 825 after LOPATIN 1982; 826, 827 after SCHÖLLER and WARCHALOWSKI in print; 828, 829 after LOPATIN 1975): 824, 825 - *Acolastus (Anopsilus) zarudnyi*; 826, 827 - *A. (A.) pici*; 828, 829 - *A. (A.) tadzhibaevi*.

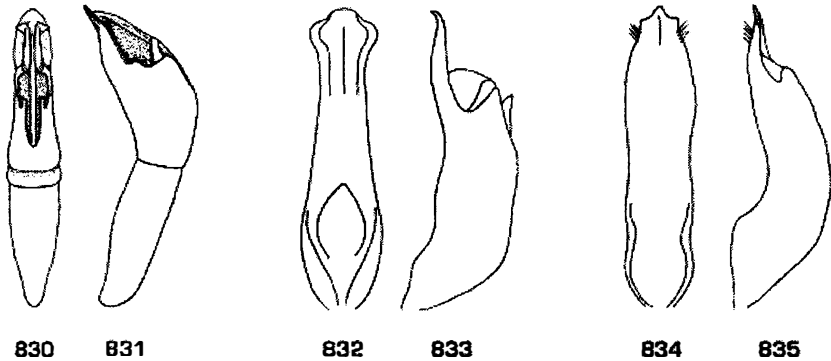
17. Pronotum black with anterior and lateral margins narrowly yellow, basal margin also narrowly yellow before scutellum. Here darkest forms of *hebraeus* (thesis 21).  
 - Disc of pronotum at least partly pale, brownish, rusty-reddish or yellowish ..... 18.
18. Species from Afghanistan, length of body over 3.4 mm ..... 19.  
 - Species from other areas ..... 20.
19. Elytra entirely pale, at most with indistinct brownish humeral spot. Body yellow, triangular spot on frons, vertex, last article of maxillar palpi, scutellum except

for its apex, underside except for borders of anal sternite and pygidium except for its apical margin black. Antennomeres 5–11, three blurred spots on pronotum and indistinct humeral spot on elytra rusty-grey. Pronotum moderately convex, 1.6–1.7 × broader than long. Elytra 2.8–3.0 × longer than pronotum, mostly on hind part covered by short erect setae. Elytral punctures deep, strong and dense, nowhere arranged in rows, interstices shining, convex, here and there confluent in small transverse wrinkles. Aedeagus not studied. Described from Afghanistan (Nuristan)

..... **afghanicus** (MEDVEDEV, 1978).

- On elytra two brown transverse bands, sometimes divided into separate spots. Pronotum yellowish with three brownish spots; both lateral spots elongate, central spot, before scutellum, small. Scutellum black with pale apex. Underside black except for pale brownish prosternum. Pronotum 1.8 × broader than long, sparsely and deeply punctured. Elytra densely, deeply and strongly punctured, intervals convex, here and there fold-shaped. On each elytron two longitudinal costae: from humeral callus to apical part and along the middle. Length 3.5–4.0 mm. Male unknown. In the original description the species is compared with *zarudnyi* (thesis 9), it can belong to the group with swollen eyes in male. Described from Afghanistan .....

..... **mandli** (LOPATIN, 1967b).



Figs 830–835. Aedeagus in dorsal, ventral and lateral view (830, 831 after SCHÖLLER and HEINIG 2000, remaining after LOPATIN 1992): 830, 831 – *Acolastus (Anopsilus) iranicus*; 832, 833 – *A. (A.) pallidus*; 834, 835 – *A. (A.) sogdianus*.

20. Pronotum and elytra entirely bare, colouration of body as in plate XX, **phot. 180** ...  
..... **21.**

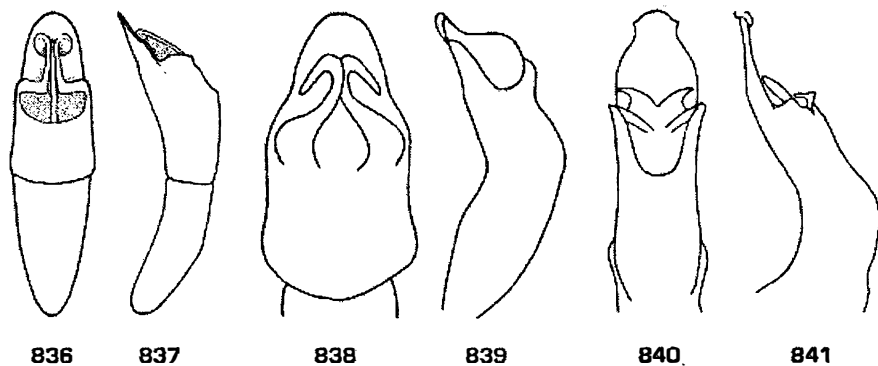
- Setae on elytra present, sometimes barely perceptible. Colouration of body different .....

21. Pronotum usually dark yellowish with five large, blurred, blackish spots, covered by black punctures as strong as on elytra, in darkest specimens black with narrow yellowish margins. Head and scutellum black. Elytra dark yellowish to ochre, covered by strong black punctures similar as on pronotum, arranged in semiregular longitudinal rows. Ground of each elytron in anterior 2/3 covered by blurred, longi-

tudinal brown or blackish stripes, in apical part pale with a single black, roundish spot. In the middle of each elytron a characteristic small, pale, smooth, impunctate area. General view as in plate XX, **phot. 180**. Aedeagus as in figs **836, 837**. Length 2.5–3.3 mm (= *sinaicus* PIC, 1937). Distributed in Israel and Egypt (Sinai) .....

..... **hebraeus** (SAHLBERG, 1913).

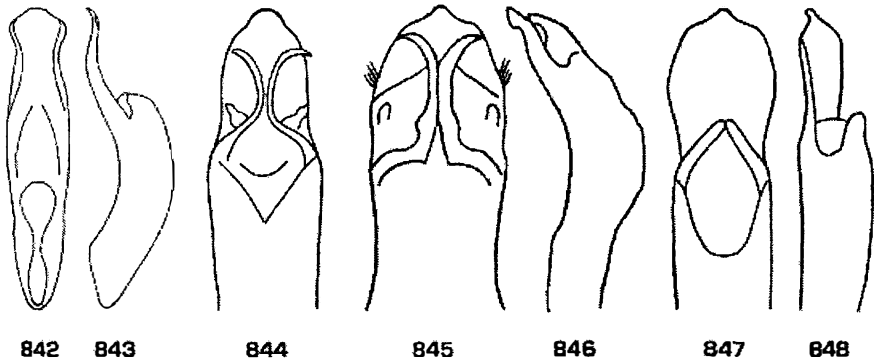
- External characters and general aedeagus shape (figs **838, 839**) similar as in *hebraeus* (thesis 21), but on average larger, punctuation of pronotum shallower and less densely scattered. Length 3.0–3.8 mm. Described from Iraq, based on one couple only. Possibly a race of *hebraeus* ..... **mesopotamicus** (LOPATIN, 1996).



Figs 836-841. Aedeagus in dorsal and lateral view (836, 837 after SCHÖLLER and HEINIG 2006; 838, 839 after LOPATIN 1996; 840, 841 after LOPATIN 1977): 836, 837 – *Acolastus (Anopsilus) hebraeus*; 838, 839 – *A. (A.) mesopotamicus*; 840, 841 – *A. (A.) minimus*.

- 22. Hairs on elytra short but distinctly visible, semierect. Basal margin of pronotum before scutellum neither thickened nor elevated. Upper side yellowish ochra with blackish markings, femora on dorsal side with narrow brown or blackish stripe. Aedeagus as in figs **840, 841**. Length 2.2–3.0 mm. Distributed in S Kazakhstan and Turkmenistan ..... **minimus** (JACOBSON, 1917).
- Hairs on elytra extremely short, erect ..... **23**.
- 23. Upper side yellowish, scutellum black, on pronotum blurred brownish spots, elytra without blackish markings ..... **24**.
- As above, but on each elytron 4 small blackish spots; one in 1/3 of length, two behind middle and one at apex. Similar to *pallidus* (thesis 16), but pronotum much longer (1.5 × broader than long) and aedeagus (figs **842, 843**) differently shaped. Described from S Tadjhikistan, recorded also from Kazakhstan .... **korotyaevi** (LOPATIN, 1992).
- 24. Head black, labrum, middle of clypeus and two oblique spots on frons yellow. Pronotum rusty-yellow with blurred brownish markings at base and with 4 pitchy-black spots on disc. Scutellum black with pale apex. Elytra rusty-yellow with small pitchy-brown humeral spot. Underside except for a narrow margin of anal sternite black. Legs yellow, femora with brownish stripe on dorsal side. Punctuation on elytra similar as on pronotum. Pronotum 1.5 × as broad as long, elytra 2.2 × longer

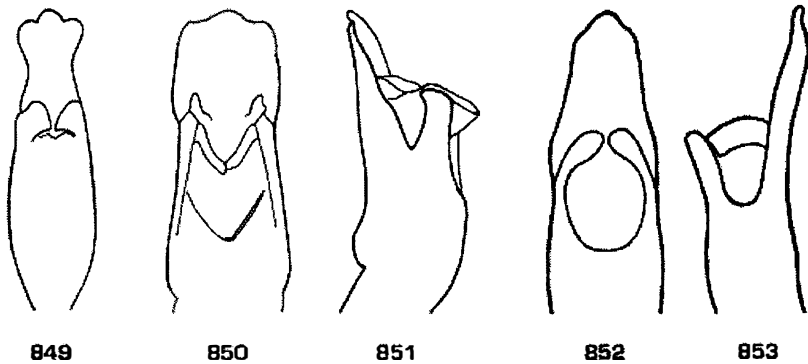
- than pronotum. Aedeagus as in fig. **844**. Length 2.5–3.0 mm. Distributed in SE Kazakhstan and in Tadzhikistan ..... **similis** (LOPATIN, 1976).
- . Head rusty-yellow with brown spots on vertex and above antennal insertions. Scutellum black with paler apex. Antennae thin and short, hardly reaching somewhat behind humeral calli. Elytra 2 × longer than pronotum, their sides almost parallel, their puncturation finer than on pronotum, very dense, interstices formed as small wrinkles. Aedeagus as in figs **845**, **846**. Length 2.8 mm. Insufficiently studied species, described from Iran, based on one specimen only ..... **jelineki** (LOPATIN, 1985).



Figs 842-848. Aedeagus in dorsal, ventral and lateral view (842, 843 after LOPATIN 1971; 844 after LOPATIN 1976; 845, 846 after LOPATIN 1985; 847, 848 after LOPATIN 1968): 842, 843 – *Acolastus (Anopsilus) koro-tyaevi*; 844 – *A. (A.) similis*, dorsal view; 845, 846 – *A. (A.) jelineki*, dorsal and lateral view; 847, 848 – *A. (A.) gurjevae*.

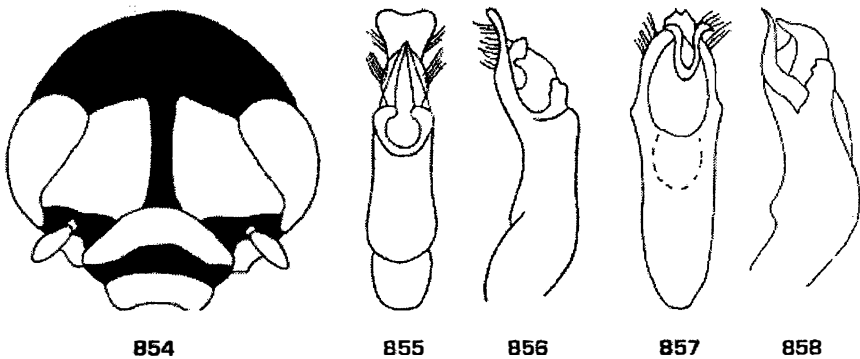
25. Frons black, or (rarely) with very small, reddish dots only. Puncturation of pronotum very fine, deep and shallow. In female on pronotum before hind angle often a rusty-yellowish spot. Aedeagus as in figs **847**, **848**. Length 2.5–3.5 mm. Distributed in E Uzbekistan ..... **gurjevae** (LOPATIN, 1968a).
- . Frons with two distinct pale spots, clypeus yellow or rusty-yellow ..... **26**.
26. Punctures on elytra at least here and there arranged in regular or semiregular rows. Frons and clypeus with whitish-yellow spots, vertex dark brown or rusty-brownish. Pronotum with blurred M-shaped pattern on yellowish ground. Ground of upper side generally pale rusty-yellow, dark pattern sometimes entirely disappearing. Aedeagus as in fig. **849**. Described from Turkmenistan ..... **kryzhanovskii** (LOPATIN, 1976).
- . Punctures on elytra entirely random ..... **27**.
27. Black pattern of elytra situated on hind half only. Primary punctures of pronotum distinct, fine. Apex of aedeagus (figs **850**, **851**) transversely cut, with rounded angles and short, very broad lamella. Length 3.0–3.8 mm. Described from Tadzhikistan ..... **postfasciatus** (LOPATIN, 1975).
- . Black pattern on elytra situated also on anterior half. Primary punctures of pronotum deep, often rugose. Yellow spots on frons oblique, their upper parts connected or narrowly separated. Primary punctures of pronotum moderately deep and

rather fine. Aedeagus as in figs **852**, **853**. Length 2.0–3.2 mm. Distributed in SE Tadzhikistan ..... **jacobsoni** (LOPATIN, 1968a).



Figs 849-853. Aedeagus in dorsal and lateral view (849 after LOPATIN 1976; 850, 851 after LOPATIN 1975; 852, 853 after LOPATIN 1968): 849 – *Acolastus (Anopsilus) kryzhanovskii*; 850, 851 – *A. (A.) postfasciatus*; 852, 853 – *A. (A.) jacobsoni*.

28. Scutellum covered by fine puncturation, rusty-red with darker margins. Upper side rusty-brown with irregular paler, yellowish-red spots. Elytra in hind part with densely arranged narrow longitudinal costae. Length 5.9 mm. Described from India, female type specimens may be lost ..... **rubiginosus** (SUFFRIAN, 1860).
- . Scutellum coarsely punctured, black, denticle at base of elytra very shallow. Very similar to the previous, but generally darker, surely one form of him. Colouration of head as in fig. **854**. Length 5.9 mm. Described simultaneously with *rubiginosus* (thesis 28) from India and probably conspecific with him; only female holotype known ..... **poecilopterus** (SUFFRIAN, 1860).



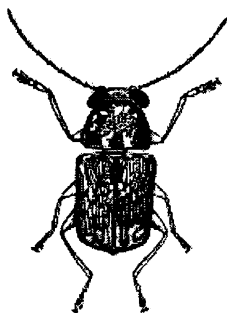
Figs 854-858 (854 after SCHÖLLER and WARCHALOWSKI 2009; 855, 856 after LOPATIN 1987; 857, 858 after LOPATIN 1997): 854 – *Acolastus (Anopsilus) poecilopterus*, colouration of head; 855-858 aedeagus in dorsal and lateral view: 855, 856 – *A. (Thelylancus) insularis*; 857, 858 – *A. (T.) indicus*.



Subgenus *Thelylankus* LOPATIN, 1997

Key to species

1. Upper side yellow with black pattern consisting mainly of short blackish puncture rows, partly fused or connected (fig. 859). On pronotum several smooth, convex, yellow areas. Black punctures and small black spots don't form a large M-shaped pattern. Apical part of aedeagus (figs 855, 856) broadened anterad, with rounded angles and gently emarginate. Length 2.5–2.8 mm. Described from Sri Lanka, recorded also from S India ..... *insularis* (LOPATIN, 1987b).
- . Generally similar to *insularis* (thesis 1), but on pronotum smooth yellow convexities somewhat indistinct and black colour forms a large M-shaped pattern. Apical part of aedeagus (figs 857, 858) small, its apex incised. Length 2.7–3.0 (male) to 3.5–3.6 mm (female). Described from S India (distr. Goa) ..... *indicus* (LOPATIN, 1997).



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Fig. 859. *Acolastus (Thelylankus) insularis*, general view (after LOPATIN 1997).

Genus *Cryptocephalus* MÜLLER, 1764

Literature: BURLINI 1955.

Key to subgenera

Not included in the key: *C. gloriosus* MULSANT, 1853, incerti subgeneris.

1. Antennae relatively short and thick, their articles 4–10 distinctly widened (= *Cerropachys* BURLINI, 1953, nec COSTA, 1847) ..... *Cerrodens* (p. 250).
- . Antennae filiform ..... 2.
2. Usually about 2/3 of last tarsomere free. Elytra at least on posterior part with sparse erect hairs ..... 3.
- . Only 1/2 or less than 1/2 of last tarsomeron free ..... 4.
3. Apex of aedeagus with narrow, incised or bifurcate process. Antennae in male relatively short and thick, in female tibiae broadened at apex. Antennomeres

- 5–10 short and broad, at most 1.5 × longer than broad. A small group (4 species) endemic to Afghanistan ..... **Bertiellus** (p. 211).
- . Apex of aedeagus without incised or bifurcate process. Antennae usually thin, antennomeres 5–10 elongate. Numerous species distributed in whole Palaearctic region ..... **Asionus** (p. 176).
4. Length of body usually 2.0–3.5 mm. Punctures of elytra arranged in regular rows. Aedeagus apically prolonged into three (rarely into two) process, his opening situated not dorsally, but apically. Head and eyes relatively small ..... **Burlinius** (p. 212).
- . Body usually longer than 3.5 mm, punctures of elytra mostly irregular or semiregular. Opening of aedeagus, except in subgenus *Heterichnus*, situated dorsally. Head and eyes relatively larger ..... **5**
5. In male anterior tibiae strongly hook-like bent distally ..... **Lamellosus** (p. 318).
- . In male anterior tibiae not hook-like bent distally ..... **6**
6. Frons and vertex black, almost always with a narrow yellowish stripe along inner margin of each eye. Opening of aedeagus situated apically, apex prolonged into two process or lobes. Ground colour of pronotum usually black. In male fore legs always prolonged, tarsomeres more or less flattened, prolonged or assymetrical .... **Heterichnus** (p. 310).
- . Another combination of characters ..... **7**
7. Epipleuron of elytra horizontal, in lateral view visible his anterior part only. In male fore tibiae strongly broadened and flattened (plate **XL**, **phot. 357**) ..... **Disopus** (p. 310).
- . Epipleuron of elytra inclined, in lateral view visible in whole length. Anterior tibiae not strongly broadened and flattened ..... **8**
8. Elytra covered by long, erected hairs, upper side metallic blue or greenish-blue, in female on elytra usually a great, orange apical spot ..... **Protophysus** (p. 319).
- . Elytra without long, erect hairs, sometimes shortly pubescent ..... **Cryptocephalus** s. str. (p. 250).

### Subgenus **Asionus** LOPATIN, 1988

Literature: LOPATIN 1977

*Asiopus* LOPATIN, 1965, nec SHARP, 1891 (*Tenebrionidae*), *Ariana* BERTI et RAPILLY, 1973, nec DALMAN, 1816 (*Lepidoptera*).

#### Key to auxiliary groups

*C. dsungaricus* PIC, 1907, an insufficiently studied species, not included in the key.

1. Black parts of pronotum at least partly with metallic lustre or reflex ..... auxiliary **group A** (p. 177).
- . Black parts of pronotum without metallic lustre or reflex ..... **2**
2. On pronotum darker colour forms glasses- or M-shaped, not always sharp, usually brown or brownish, rather rarely black pattern. Elytral patterns on elytra form 1–3 blurred or wavy, sometimes criss-cross transverse bands. This group of species, characterized by pronotal pattern and regular puncturation of elytra („*undulatus*“

- group“) is usually ranked as belonging to subgenus *Asionus*, however in not all representatives the 4<sup>th</sup> tarsomere is prolonged ..... auxiliary **group B** (p. 181).
- Without combination of transverse pattern on regularly punctured elytra and glasses or M-shaped dark pattern on pronotum ..... **3**.
  - 3. Elytra bare or with sparsely scattered hairs in apical part only ..... **4**.
  - Elytra covered by hairs on whole surface ..... auxiliary **group C** (p. 185).
  - 4. Primary punctures of elytra arranged in regular, longitudinal rows ..... **5**.
  - Primary punctures of elytra random or arranged in confuse, irregular rows ..... **6**.
  - 5. Pronotum strongly punctate ..... auxiliary **group D** (p. 188).
  - Pronotum finely punctate ..... auxiliary **group E** (p. 195).
  - 6. Pronotum strongly punctate ..... auxiliary **group F** (p. 197).
  - Pronotum finely or feebly punctate ..... auxiliary **group G** (p. 199).

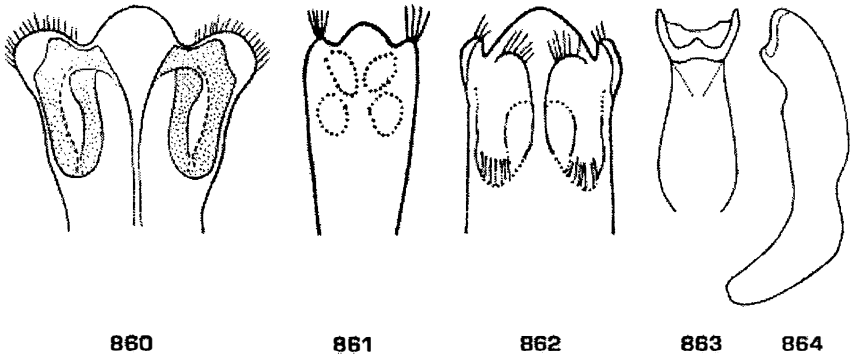
### Auxiliary group A

Metallic shine or reflex on upper side is present.

#### Key to species

- 1. Elytra on whole surface covered by short, erect hairs ..... **2**.
- Elytra bare or at most with several sparse, short hairs in apical part ..... **5**.
- 2. Legs entirely pale, upper side fulvous with black pattern ..... **3**.
- At least mid and hind femora blackish ..... **4**.
- 3. Mid and hind legs black (in immature specimens dark brown). Body black with bluish metallic reflex, fore tibiae and a few basal antennomeres reddish, in hind angles of pronotum usually a small, dark yellowish spot. Aedeagus as in fig. **860**. General view as in plate XXI, **phot. 186**. Length 4.1–5.2 mm (= *semiviridis* MARSEUL, 1875, *sibiricus* MARSEUL, 1875, *egregius* WEISE, 1887, *yamadai* CHŪJŌ, 1940, *ainu* CHŪJŌ, 1959). Variations: elytra entirely brownish with undefined, blurred, blackish areas (unnamed), upper side dark,, in apical part of elytra pale transverse stripe, lateral margins of elytra and sometimes of pronotum pale (ab. *flavomixtus* JACOBSON, 1901). Distributed from W Siberia and Altai to Sakhalin and Japan, known also from N China ..... **hirtipennis** FALDERMANN, 1835.
- Mid and hind femora on dorsal side blackish, remaining parts of legs pale. Body elongate, upper side dark blue-black, metallic reflex on elytra stronger. Clypeus yellowish. On pronotum narrow anterior marginal stripe and spots in hind angles yellow. On elytra basal and narrow marginal stripes with outer half of epipleura yellow. Elytra covered by relatively long, erect hairs and by strong, dense punctures. Aedeagus as in fig. **861**. Length 2.7–3.5 mm. Distributed from Mongolia to basin of Amur ..... **zinoujevi** MEDVEDEV, 1973.
- 4. Pubescence of upper side relatively dense, long, on pronotum semierect, on elytra erect, always very distinct. Puncturation of elytra random. Body dark yellowish or pale orange. A spot on vertex, two large longitudinal spots on pronotum, usually anterior part of scutellum, almost whole pygidium and on each elytron a broad, discal longitudinal stripe reaching 4/5 length of elytron black. On elytra black stripes with blue or green-blue metallic reflex. General view as in plate XXI, **phot. 188**. Aedeagus

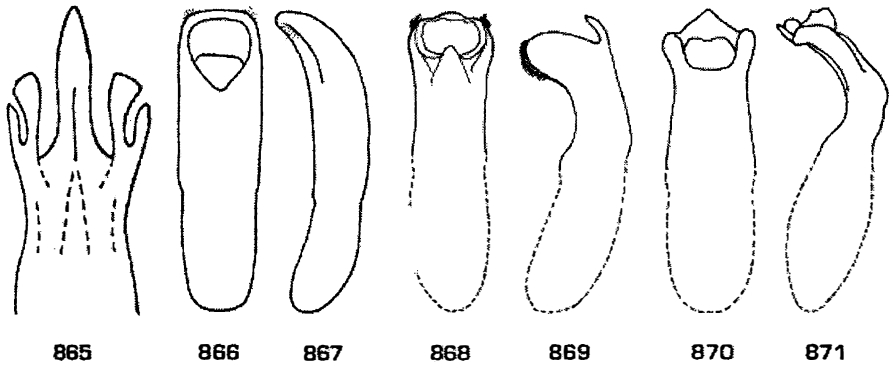
- as in fig. 862. Length 3.6–4.6 mm (= *discoideus* FAIRMAIRE, 1888 nec CHAPUIS, 1879, *confucius* CLAVAREAU, 1913, *hoffmanni* PIC, 1938, *pici* PAPP, 1946). Variations: metallic reflex of black pattern indistinct or absent (unnamed), pale variation – black pattern on elytra disappear (unnamed), dark variation – spots on pronotum and elytra broader, on pronotum before scutellum an additional, narrow, longitudinal black stripe (unnamed). Distributed in Mongolia, E Siberia and NE China ..... *lemniscatus* SUFFRIAN, 1954.
- . Pubescence of upper side very short and rather sparse, on pronotum adpressed, on elytra semierect, hardly visible. Primary punctures on elytra form semiregular, geminate longitudinal rows. Colouration of body similar as in *lemniscatus* (thesis 4), but on elytra additionally a black, sutural stripe. Length about 4.0 mm. Aedeagus unknown. An insufficiently studied species, described from N China (Kansu), after some authors identical with *C. bivulneratus gobiensis* (antithesis 8) ... *gansuicus* CHEN, 1942.



Figs 860-864. Aedeagus or its apical part only in dorsal and lateral view (863, 864 after LOPATIN and DOVGAILO 2002, remaining after Medvedev 1982): 860 – *Cryptocephalus (Asionus) hirtipennis*; 861 – *C. (A.) zinoujevi*; 862 – *C. (A.) lemniscatus*; 863, 864 – *C. (A.) cunctatus*.

5. All legs black (sometimes with slightly paler apical part of tibiae) or black with metallic shine ..... 6.
- . At least fore legs partly pale ..... 7.
6. Elytra entirely ochraceous or testaceous. Pronotum black with weak bronzy metallic reflex, its lateral borders rather broadly pale, anterior margin with narrow pale stripe. Elytra uniformly, entirely randomly punctate. Aedeagus as in figs 863, 864. In immature specimens metallic reflex on pronotum barely perceptible. General view as in plate XXI, phot. 183. Length about 4.0 mm (= *dichrous* FAIRMAIRE, 1888, nec CHAPUIS, 1875). Insufficiently studied species, classified now in the *Cryptocephalus* s. str., now to *Asionus*, but possibly belonging to the subgenus *Heterichnus* (pale spots at eyes, form of aedeagus). Known from China (Hopei, Shantung) only ..... *cunctatus* CLAVAREAU, 1913.
- . Upper side and legs entirely metallic green, metallic shine vivid. Underside and antennae black with weak metallic reflex, antennomere 2 reddish. General view as

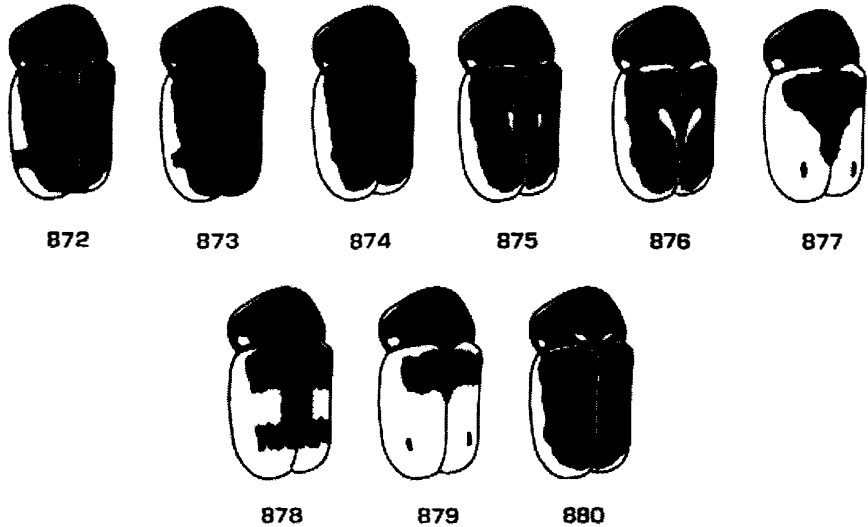
- in plate XXI, **phot. 184**. Length 4.3–4.8 mm. Distributed in Kyrgyzstan (Tien Shan) and NE Hindukush (Tadzhikistan) ..... *dilectus* WEISE, 1894.
7. Mid and hind legs alike dorsal part of anterior femora black with feeble metallic lustre ..... **8**.
- All tibiae testaceous or yellowish ..... **10**.



Figs 865-871. Aedeagus or its apical part only in dorsal and lateral view (865 after MEDVEDEV 1982, remaining after WARCHALOWSKI 2003): 865 – *Cryptocephalus (Asionus) bivulneratus*; 866, 867 – *C. (A.) apicalis*; 868, 869 – *C. (A.) ergenensis*; 870, 871 – *C. (A.) lateralis*.

8. Pronotum finely punctured, shining ..... **9**.
- Pronotum strongly punctured, its ground feebly shining, covered by fine reticulation, punctures deep, slightly elongate and dently scattered. Pronotum orange red with two large black spots on anterior half and with two small black spots at hind margin. Often the black colour expand and the red colour is reduced to an great, anchor-like spot. Elytra black with bluish or bluish-green metallic reflex, apex and often a narrow marginal stripe orange. General view as in plate XXI, **phot. 182**. Length 4.1–5.0 mm (= *ourganus* PIC, 1909). One subspecies from Mongolia is described: on elytron two longitudinal black stripes, one on disc and one along suture. Pale coloured parts of upperside rather yellowish and not reddish (subsp. *gobiensis* MEDVEDEV, 1980). Distributed in Tuva, Mongolia and Transbaicalia ..... *bivulneratus* FALDERMANN, 1835.
9. On hind part of pronotum before scutellum no elongate, oblique yellowish spots (or, in rare variations very small, vestigial only). General view as in plate XXI, **phot. 181**. Upper side usually greenish- or bluish-black with a small spot in posterior angles of pronotum, apex of elytron and lateral spot in its anterior part yellowish. Several colour aberrations were described, their names see figs **872–880**. Length 4.3–5.7 mm (= *flavoguttatus* SUFFRIAN, 1847, *quadriguttatus* GEBLER, 1848, *eburatus* WEISE, 1881, *holtzi* PIC, 1909, *hortobagyanus* PIC, 1909). Distributed from Austria to eastern Siberia; in Europa known mostly from Slovakia, Balkan countries and Ukraine ..... *apicalis* GEBLER, 1830.
- On hind part of pronotum before scutellum two yellow, usually narrow and rather long, oblique spots. Elytra pale yellowish with a dark humeral spot and very narrowly

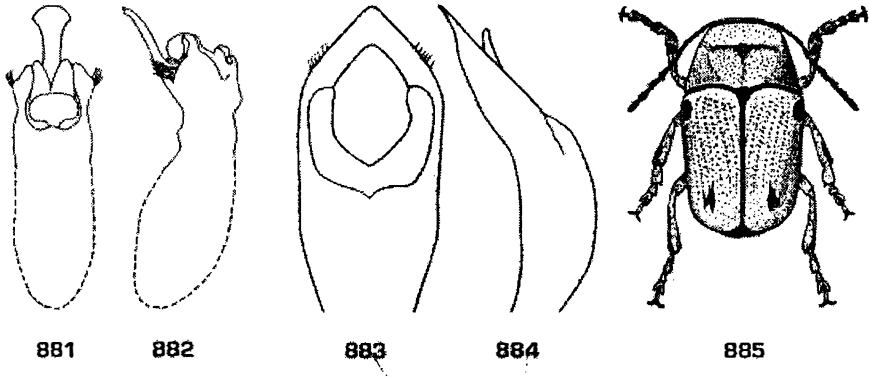
blackened sutura. General view as in plate XXI, **phot. 185**. Pronotum greenish black with anterior and lateral margins, a spot in posterior angles and two oblique stripes in posterior part yellow. Length 3.8–4.6 mm (= *beckeri* SUFFRIAN, 1864 nec MORAWITZ, 1860, *georgicus* MEDVEDEV et SEPTELADZE, 1963). Variations: on elytron humeral black spot only (typical form), on elytron two (humeral and postmedian) elongate black spots (unnamed), mid and hind legs almost entirely black (unnamed). Distributed in Caucasian countries, basin of Ural and in Central Asia .....  
 ..... *ergensis* MORAWITZ, 1863.



Figs 872-880. Colour aberrations of *Cryptocephalus (Asionus) apicalis* (after WARCHALOWSKI, 1991): 872 – typical form; 873 – ab. *limbipennis* CSIKI, 1953; 874 – ab. *marginatipennis* CSIKI, 1953; 875 – ab. *hortobagyanus* PIC, 1909; 876 – ab. *csepelensis* CSIKI, 1953; 877 – *rimskii* JACOBSON, 1907; 878 – ab. *delicatissimus* ROUBAL, 1940; 879 – ab. *eburatus* WEISE, 1882; 880 – ab. *holtzi* PIC, 1909.

10. In mature specimens upper side black with feeble but distinct greenish or bronzy metallic lustre. General view as in plate XXI, **phot. 187**. Lateral margins and apex of elytra orange, sometimes also pronotum with reddish spot in posterior angles. In immature specimens pronotum rust-reddish without metallic lustre, elytra pale testaceous, his apical part and lateral margins ivory yellowish. Length 2.5–3.2 mm (= *aeneus* STIERLIN, 1863). Distributed from Crimea to Altai .....  
 ..... *lateralis* SUFFRIAN, 1863.
- . Even in mature specimens metallic tinge on black parts of upper side barely perceptible. General view as in plate XXI, **phot. 189**. Pronotum black with anterior margin, posteriorly shortened median stripe, posterior angles and a transverse stripe before scutellum pale yellowish. Elytron pale yellowish with broad longitudinal stripe reaching to apical area and very narrow sutural stripe black. Aedeagus as

in figs **881**, **882**. Length 3.2–4.0 mm. Distributed in basin of Volga and in Central Asia ..... **sareptanus** MORAWITZ, 1863.



Figs 881-885 (885 after RAPILLY 1980, remaining after LOPATIN 1977). 881-884 – aedeagus in dorsal and lateral view: 881, 882 – *Cryptocephalus (Asionus) sareptanus*; 883, 884 – *C. (A.) vitellinus*; 885 – *C. (A.) vitellinus*, general view.

### Auxiliary group **B**

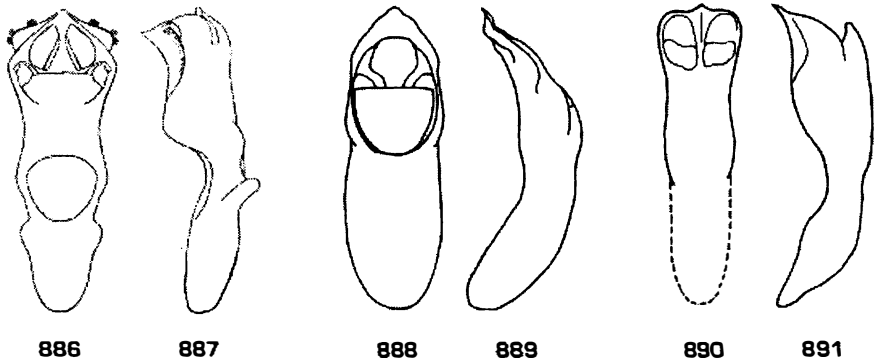
#### „*undulatus*-group“

#### Key to species

1. Elytra covered by short pubescence ..... **2**.
- Elytra bare ..... **3**.
2. Body length under 4.0 mm. Colouring of body very pale, yellow, vertex and two spots on frons brown, antennomeres 4–11 darkened, Basal margin of pronotum, scutellum and suture dark brown. Glass-shaped pattern on pronotum also very pale. Legs yellow, femora, tibiae and partly tarsi with brown spots. Apical margin of aedeagus (figs **883**, **884**) regularly rounded with small median lamella. Frons finely punctate. Length 3.5–3.9 mm. Variation: antennae almost entirely darkened, on pronotum dark pattern more distinct, on each elytron roundish humeral spot and in apical part a trace of wavy band in form of irregular spot (*ab. lucidus* RAPILLY, 1980, General view as in fig. **885**). Distributed in Iran ..... **vitellinus** LOPATIN, 1980.
- Body length over 5.5 mm. Pattern on pronotum and wavy transverse postmedian stripe on elytra blackish. Apical margin of aedeagus (figs **886**, **887**) transverse, with short and broad median lamella. General view as in plate XXII, **phot. 190**. Length 5.6–6.0 mm. Described from Iran ..... **zarudnianus** MEDVEDEV, 1971.
3. Tarsomere 4 very long, 3–4 × longer than 3. Pronotum very strongly and deeply punctured, punctures dense, slightly elongate; in the median line of anterior half of pronotum usually a convex, longitudinal, impunctate stripe. General view as in plate XII, **phot. 196**, punctures of upper side as in plate XXII, **phot. 197**. Aedeagus

as in figs **888, 889**. Length 3.1–4.1 mm (= *astracanicus* SUFFRIAN, 1867). Distributed in Caucasian countries, in Transcaspia, Mongolia and NW China .....

- ..... **tamaricis** SOLSKY, 1870.  
 -. Tarsomere 4 shorter, 1.5–2.2 × longer than 3 ..... 4.  
 4. Puncturation of pronotum strong or very strong (plate 22, **phot. 195, 197**) ..... 5.  
 -. Puncturation of pronotum moderately strong of fine ..... 7.



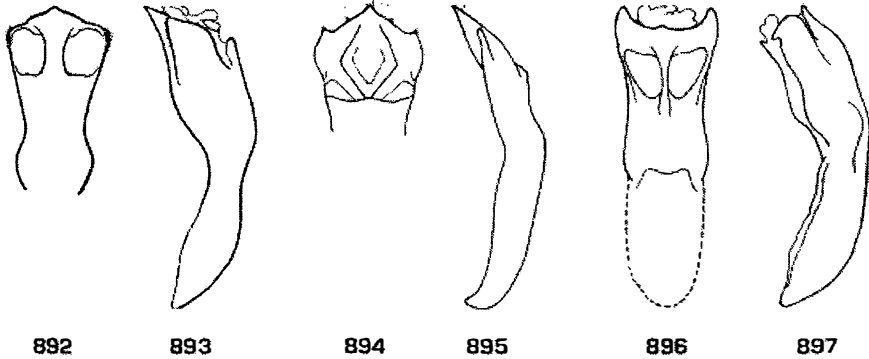
Figs 886-891. Aedeagus in dorsal and lateral view (886, 887 after LOPATIN 1980; 888, 889 after LOPATIN 1977; 890, 891 after BERTI and RAPILLY 1979):. 886, 887 – *Cryptocephalus (Asionus) zarudnianus*; 888, 889 – *C. (A.) tamaricis*; 890, 891 – *C. (A.) undulatus*.

5. Dark pattern on upper side indistinct, not much darker than ground, hind transverse band on elytra blurred. General view as in plate XXII, **phot. 194**, punctures of upper side as in plate XXII, **phot. 195**. Aedeagus (**892, 893**) on underside before apex with two deep longitudinal depressions. Length 3.3–4.0 mm. Described from Egypt. Here perhaps also a similar, from Israel described, insufficiently studied form, *moricei* PIC, 1908 ..... **punctatissimus** SUFFRIAN, 1857.  
 -. Dark pattern on upper side distinctly darker than ground, hind transverse band on elytra narrow but well-defined, wavy, often interrupted ..... 6.  
 6. Lateral broadening of apical part of aedeagus in dorsal view evenly rounded. General view as in plate XXII, **phot. 198**. Aedeagus (figs **890, 891**) on underside before apex with two transverse depressions. Length 4.2–5.3 mm (= *bucharicus* PIC, 1907). Distributed in Transcaspia, Iran, Afghanistan and W Mongol ..... **undulatus** SUFFRIAN, 1854.  
 -. Lateral broadenings of apical part of aedeagus in dorsal view not rounded, somewhat angulate. Primary puncturation of elytra more dense than in *undulatus* (thesis 6). Remaining characters as in *undulatus*. Distributed in SE Iran, possibly a race of *undulatus* ..... **fasciatointerruptus** BERTI et RAPILLY, 1979.  
 7. Larger, length of body usually more than 4.8 mm ..... 8.  
 -. Smaller, length of body usually under 4.8 mm ..... 13.  
 8. Body relatively large (length 5.0–6.9 mm) and distinctly slender. Ground colour of upper side dark yellow. Dark pattern on upper side relatively pale, brownish.



Variation *moricei* Pic, 1908 belongs not here (see thesis 5). Aedeagus as in figs **894**, **895**. Described from Sinai, known from Egypt and Israel .... *sinaita* SUFFRIAN, 1854.

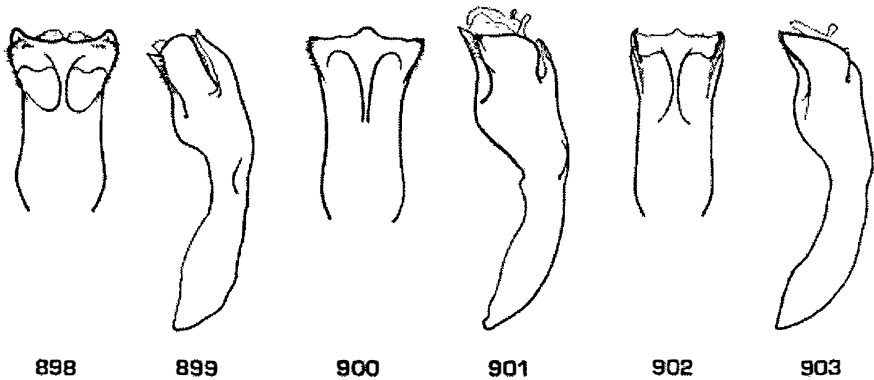
- Body rather stout ..... **9**.
- 9. Apical margin of aedeagus in ventral view emarginate ..... **11**.
- Apical margin of aedeagus not emarginate, almost straight, with a small lamella in the middle ..... **10**.



Figs 892-897. Aedeagus (or its apical part only) in dorsal and lateral view (894, 895 after LOPATIN and DOVGAILO 2002, remaining after BERTI and RAPILLY 1979): 892, 893 – *Cryptocephalus (Asionus) punctatissimus*; 894, 895 – *C. (A.) sinaita*; 896, 897 – *C. (A.) subtigrinus*.

- 10. Apical margin of aedeagus (figs **896**, **897**) in ventral view deeply emarginate. Colouration of upper side similar as in *undulatus* (thesis 6). In male first tarsomere of fore legs flattened and broadened, subquadrate. General view as in plate XXII, **phot. 193**. Ground colour of upper side brick red. Length 5.5–6.5 mm (= *undatus* SUFFRIAN, 1853 nec OLIVIER, 1791, *phaleratus* SUFFRIAN, 1853, nec SCHALLER, 1783, *tigrinus* BERTI et RAPILLY, 1979). Variation ab. *bucharicus* REITTER, 1907 belongs probably not here. Distributed in Caucasian countries, NW Iran and W Turkmenia ... *fulmenifer* REITTER, 1889.
- Apical margin of aedeagus (figs **898**, **899**) in ventral view shallowly emarginate. Colouration as in *phaleratus* (thesis 10). Length 4.6–5.2 mm. Described from W Iran (Lorestan) ..... *subtigrinus* BERTI et RAPILLY, 1979.
- 11. Upper side almost mat, underside covered by dense silvery pubescence, outline of body elongate. See *zarudnianus*, auxiliary group B, antithesis 2.
- Upper side shining, underside covered by sparse pubescence. Body more stout .... **12**.
- 12. Length 5.7 mm. Aedeagus as in figs **900**, **901**. Described from Saudi Arabia ..... *petraeus* SUFFRIAN, 1854.
- Length 4.6–5.2 mm. Aedeagus as in figs **902**, **903**. Described from Yemen ..... *subdeserticola* BERTI et RAPILLY, 1979.
- 13. W Mediterranean species ..... **14**.
- Species from Near East, Middle East and Asia ..... **15**.

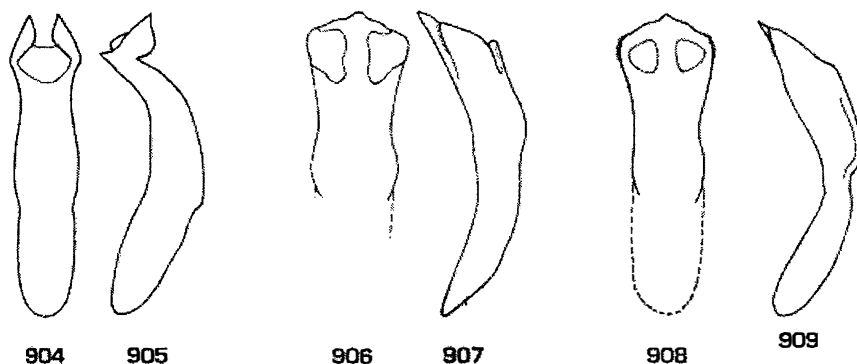
14. European species, reported also from Algeria. General view as in plate XXII, **phot. 192**. Underside for the most part black, mesoepisterna yellow, legs entirely pale. Aedeagus as in figs **904, 905**. Length 3.8–5.0 mm. Variations: on elytra transverse stripes reduced to three (ab. *doctoris* PIC, 1900) or to two (ab. *jacqueti* PIC, 1900) dots, sometimes entirely absent (ab. *pyrenaeus* WEISE, 1882). Distributed in southern France, Iberian Peninsula and in Algeria ..... *mariae* REY, 1851.
- . N African species. General view as in plate XXII, **phot. 191**. Aedeagus as in figs **906, 907**. Length 3.7–4.8 mm (= *fulguritus* MARSEUL, 1875). Variation: immature specimens, black pattern of upper side partly disappearing (ab. *mezounanus* PIC, 1914). Distributed from Morocco to Egypt ..... *fulgurans* FAIRMAIRE, 1873.



Figs 898-903 Aedeagus in dorsal and lateral view (904, 905 after BURLINI 1955; 906, 907 after BERTI and RAPILLY 1979; 908, 909 after Lopatin 1997): 898, 899 – *Cryptocephalus (Asionus) subtigrinus*; 900, 901 – *C. (A.) petraeus*; 902, 903 – *C. (A.) subdeserticola*.

15. Hind dark band on elytron at least in its inner half entire, arched, linear. Here forms of *undulatus* (thesis 6) with less strong puncturation of pronotum.
- . Hind dark band on elytron divided into 2–5 spots, reduced to a small dot or absent...  
..... 16.
16. Aedeagus as in figs **908, 909**. Pronotum strongly convex, about 1.65 × broader than long. General view as in plate XXIII, **phot. 199**. Upper side very variably coloured. Ground yellowish with black pattern, pronotum tending to melanism, usually partly darkened with black spots, more rarely entirely black. On elytra black pattern may be reduced or spreading and fused. Length 3.5–4.8 mm. Variations: pronotum very dark, for the most part black, with anterior and posterior margins yellowish, usual light pattern reduced (ab. *euphraticus* PIC, 1913), posterior part of elytra with numerous small spots (ab. *alepensis* PIC, 1916). Distributed in Syria and Iraq. In Iran forms a subspecies with more sparsely punctured elytra and pronotal pattern somewhat reduced (subsp. *iranicus* BERTI et RAPILLY, 1979) ..... *augustalisi* PIC, 1913.

- Aedeagus as in figs **910**, **911**. External characters as in *augustalisi* (thesis 16). Perhaps conspecific with *augustalisi*. Described from Israel .....  
 ..... **dinae** LOPATIN et CHIKATUNOV, 2000.



Figs 904-909. Aedeagus (or its apical part only) in dorsal and lateral view (after BERTI and RAPILLY 1979): 904, 905 - *Cryptocephalus (Asionus) mariaae*; 906, 907 - *C. (A.) fulgurans*; 908, 909 - *C. (A.) augustalisi*.

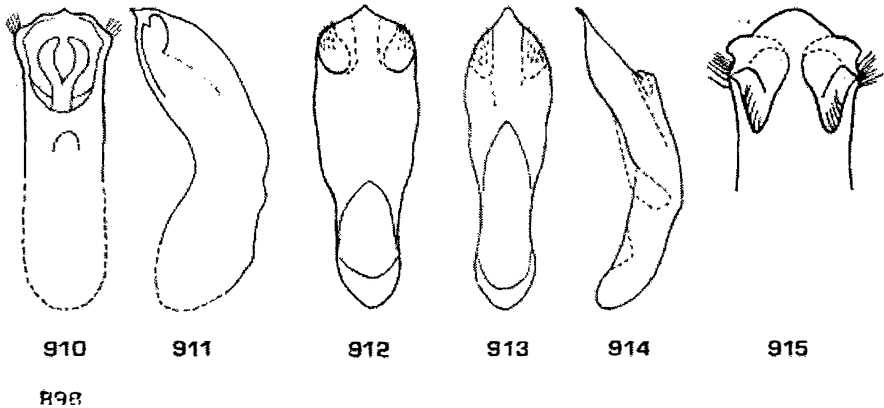
### Auxiliary group C

Elytra covered by hairs on whole surface.

#### Key to species

1. Pronotum and elytra pale or pale except small humeral spot ant narrow sutural stripe. Here also two small (length of body about 3.0 mm) species near to *vitellinus* (auxiliary group B, thesis 2) and belonging probably to „*undulatus*“ group, but discussed here, because pronotal patterns are not distinctly visible ..... **2**.
- Pronotum or/and elytra with dark pattern, sometimes in great part dark ..... **4**.
2. Upper side yellow; on humeral callus indistinct brownish spot, five apical antennomeres black, apical part of tibiae and tarsi more or less darkened. Length of body 2.7-4.2 mm (= *lucidus* RAPILLY, 1980). Described from Iran. *C. (A.) vitellinus*, see auxiliary group B, thesis 2.
- Without combination of black apical antennomeres and pale upper side ..... **3**.
3. Elytra except basal margin entirely pale, dull. Underside pale, metathorax blackish. Head and pronotum finely but densely punctate, primary punctures on elytra arranged in regular, longitudinal, rather fine and not very distinct rows. Aedeagus (fig. **912**) on underside before apex with two roundish impressions. Length 2.8 mm. Described from Oman ..... **omanicus** MEDVEDEV, 1996.
- Elytra with a humeral spot and narrow sutural stripe black. Underside black, lateral margins of abdomen yellowish. Head strongly punctate. Aedeagus as in figs **913**, **914**. Length 2.9-3.1 mm (male) to 4.0 mm (female). Described from Oman .....  
 ..... **pubescens** MEDVEDEV, 1996.

- 4. Primary punctures on elytra arranged in regular, longitudinal rows, sometimes partly confused ..... 5.
- Primary punctures on elytra random or arranged in irregular longitudinal stripes ...  
..... 7.
- 5. Elytron black with four (subhumeral, basal, median and apical) large yellowish-orange spots. Apical spot usually cover also hind part of lateral margin. General view as in plate XXIII, **phot. 200**. Aedeagus as in fig. **915**. Length 4.0–5.2 mm. Distributed in Mongolia, E Siberia, NE China and Korea ..... **koltzei** WEISE, 1887.
- Elytron with longitudinal pattern or black with basal spot only ..... 6.



Figs 910–915. Aedeagus (or its apical part only) in dorsal and lateral view (910, 911 after LOPATIN and CHIKATUNOV 2000; 912–914 after MEDVEDEV 1996; 915 after MEDVEDEV 1982): 910, 911 – *Cryptocephalus (Asionus) dinae*; 912 – *C. (A.) omanicus*; 913, 914 – *C. (A.) pubescens*; 915 – *C. (A.) koltzei*.

- 6. Behind scutellum two roundish black spots, usually fused with sutural stripe. Elytron dark yellow, orange or reddish. Lateral stripe reaching almost to lateral margin and broad common sutural stripe black. Scutellum black. Primary punctures of elytra partly confused. Legs pale, knees, tarsi and antennomeres 5–11 darkened. General view as in plate XXIII, **phot. 201**. Aedeagus as in figs **916, 917**. Length 3.4–4.2 mm (male) to 4.0–4.7 mm (female). Variations: longitudinal stripes very narrow, black spot behind scutellum not connected with sutural stripe (ab. *eusenicus* WEISE, 1900), elytra black with basal and lateral narrow pale stripes (ab. *mesmini* PIC, 1908). Here also probably *amasiensis* WEISE, 1884, perhaps a local form of *flexuosus*, in opinion of some authors a distinct species, differing by darker colouring of body. Distributed from Crimea Ukraine and Caucasian countries to Kirgisia, E Kazakhstan and Altai Mts. .... **flexuosus** KRYNICKI, 1832.
- Behind scutellum no two roundish black spots. Pronotum black with anterior an lateral margins narrowly yellowish, sometimes additionally two small transverse pale stripes before scutellum. Primary punctures of elytra rather fine, arranged in regular longitudinal rows. Aedeagus as in figs **918, 919**. Length 3.6–3.9 mm. Variations: sutural and discal black longitudinal stripes separated, on pronotum before

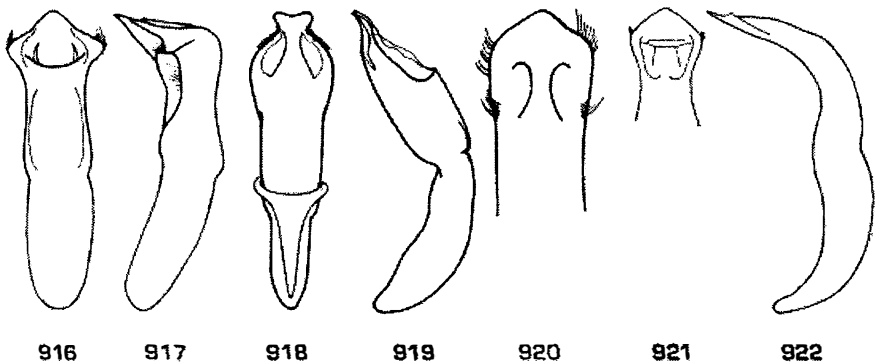
scutellum two small, transverse yellowish spots (unnamed), sutural and discal black longitudinal stripes separated, pronotum black with anterior and lateral margins yellowish (typical form), sutural and discal black longitudinal stripes fused in the middle and in apical part (unnamed), elytra black, on each elytron short, transverse yellow stripe along basal margin (unnamed). Described from Iran .....

..... **davatchii** BERTI et RAPILLY, 1973.

7. Elytron yellow with long, broad, discal longitudinal stripe and common sutural stripe black or almost entirely black with narrow marginal pale stripe only. Pronotum black with anterior and lateral margins (at hind angles broadened), short median line and two large roundish spots in hind part yellow. Scutellum black. Legs entirely yellow, antennomeres 5–11 darkened. On elytra primary puncturation suffused with black, in scutellar area often somewhat confuse. General view as in plate XXIII, **phot. 202**. Aedeagus as in fig. **920**. Length 2.8–4.2 mm. Variations: upper side almost entirely black except narrow external margins of pronotum and elytra and apical area (unnamed melanotic variation), black colour more expanded than in typical form, two roundish yellow spots on pronotum very small (unnamed). Distributed in Mongolia, N China, Transbaicalia, E Siberia and Korea .....

..... **limbellus** SUFFRIAN, 1847.

- On elytron no long, black discal stripe ..... **89**.

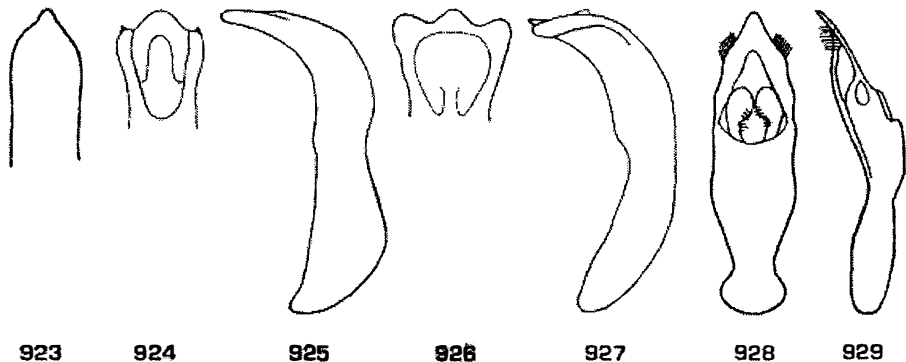


Figs 916-922. Aedeagus (or its apical part only) in dorsal and lateral view (916, 917 after WARCHALOWSKI 1991; 918, 919 after BERTI and RAPILLY 1979; 920 after MEDVEDEV 1982; 921, 922 after LOPATIN and DOVGALLO 2002): 916, 917 – *Cryptocephalus (Asionus) flexuosus*; 918, 919 – *C. (A.) davatchii*; 920 – *C. (A.) limbellus*; 921, 922 – *C. (A.) pilosellus*.

8. Elytra pale with three transverse, broad, blackish, somewhat irregular bands . Pronotum black with pale anterior and lateral margins and with two transverse pale stripes at basal margin. General view as in plate XXIII, **phot. 203**. Aedeagus as in figs **921**, **922**. Length 2.8–4.3 mm (= *nigroscriptus* FAIRMAIRE, 1888). Distributed in Mongolia, N China, Transbaicalia and E Siberia ..... **pilosellus** SUFFRIAN, 1854.

- Elytra without transverse bands ..... **9**.

9. Primary puncturation of elytra random, at least with traces of longitudinal rows .... 10.  
 -- Primary puncturation of elytra semiregular. Elytron dark yellowish with black humeral spot, longitudinal discal stripe, common sutural stripe and a subsemilunar stripe running parallel to apical margin. Aedeagus as in fig. 923. Length 3.7–4.5 mm. Distributed in NW China and Mongolia ..... *kozlovi* LOPATIN, 1977.



Figs 923-929. Aedeagus (or its apical part only) in dorsal and lateral view (923 after Medvedev 1982; 928, 929 after Lopatin 1980; remaining after LOPATIN and DOVGAILO 2002): 923 – *Cryptocephalus (Asionus) kozlovi*; 924, 925 – *C. (A.) pseudolateralis*; 926, 927 – *C. (A.) borochoensis*; 928, 929 – *C. (A.) khajami*.

10. Upper side black, head partly yellow. Pronotum black with yellow lateral (broad) and anterior (narrow) lateral stripe, often also traces of a shortened median stripe. Elytra black with broad lateral stripe covering epipleura and apical board, usually narrowed behind humeral calli and in hind part. Prosternum pale, meso- and metasternum with pale epimeres. Legs pale except hind coxae, tarsi somewhat darkened. Aedeagus as in figs 924, 925. Length 3.7–4.0 mm. In melanotic variations prosternum brown and pronotal yellow stripes very narrow. Distributed in E Kazakhstan ..... *pseudolateralis* MEDVEDEV, 1973.  
 -- Pronotum black with pale lateral margins, elytra dirty testaceous with black humeral spot. Femora and tarsi darkened, tibiae at least in distal part pale. Aedeagus as in figs 926, 927. Length 4.2–4.8 mm (= *kulenovae* LOPATIN, 1967). Distributed in SE Kazakhstan and in W Sinkiang ..... *borochoensis* PIC, 1907.

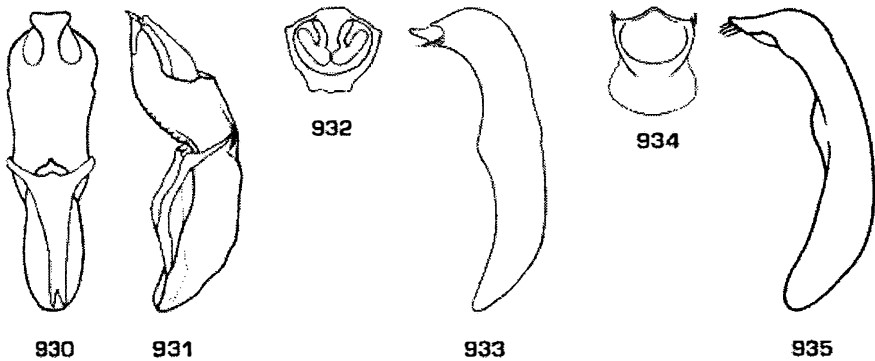
#### Auxiliary group D

Puncturation of elytra arranged in rows, pronotum strongly punctate.

#### Key to species

1. Elytron dark yellow or orange with black or blackish pattern ..... 2.

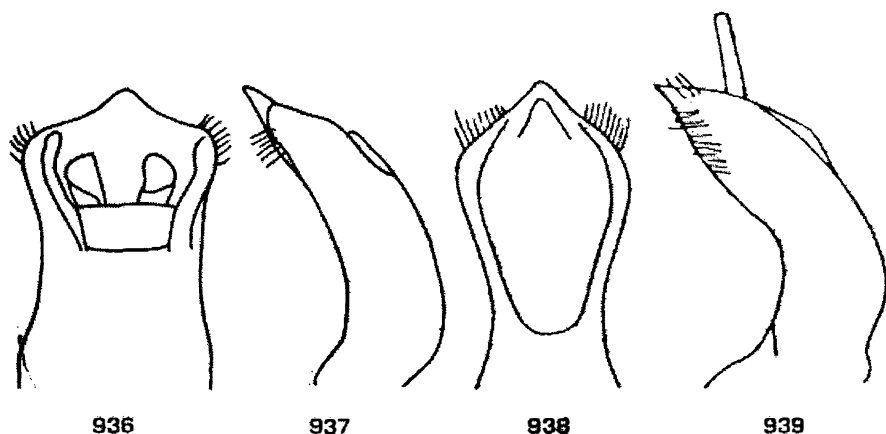
- Elytra without distinct dark pattern, upper side pale, at most with blackish suffused punctures, numerous, small, brownish dots or blurred darkenings, sometimes almost uniformly blackish ..... 9.
- 2. On each elytron, along its middle, run a longitudinal blackish or black discal stripe .... 3.
- Elytra without black discal stripe ..... 8.
- 3. On pronotum dark colour forms two large, usually blurred spots and a short longitudinal stripe before scutellum. On elytra, apart humeral spot, longitudinal stripe. Three species similar to each other from Transcaspia, distinguishable mainly by shape of aedeagus ..... 5.
- On pronotum usually great part of surface black, on black ground two large, yellow spots before scutellum. Black colour sometimes reduced to two lateral transverse stripes. In pale coloured specimens discal stripe shortened. In dark coloured specimens black elytral pattern (humeral, discal and sutural) fused by a transverse band just behind scutellum. Two species from Iran ..... 4.



Figs 930-935. Aedeagus (or its apical part only) in dorsal, ventral and lateral view (930, 931 after BERTI and RAPILLY 1979, remaining after LOPATIN and DOVGAILO 2002): 930, 931 – *Cryptocephalus (Asionus) zarudnyi*; 932, 933 – *C. (A.) ogloblini*; 934, 935 – *C. (A.) bitaeniatus*.

- 4. Apex of aedeagus (figs 928, 929) triangularly narrowed, its very tip obtuse. Body outline more elongate. In pale specimens elytra almost uniformly dark yellow, with darkened sutural margin, pronotal pattern partly reduced, but always well visible. Length 3.5–3.8 mm. Described from Iran ..... **khajami** LOPATIN, 1980.
- Apex of aedeagus (figs 930, 931) broadly rounded, its very tip formed as lamella broadened anteriorly and transversely cut. Body outline more stout. In pale coloured specimens black pattern reduced: on pronotum to two short, transverse stripes, on elytra discal stripe and humeral spot being separated. General view as in plate XXIII, phot. 204. Length 3.1–3.8 mm (= *kharazii* BERTI et RAPILLY, 1979). Described from Iran ..... **zarudnyi** LOPATIN, 1953.
- 5. In male anal sternite at base with a small process. Apical part of aedeagus (figs 932, 933) broadened, apex transversely cut. Length 4.3–4.9 mm. Variation:

- pale form, distal stripe present, but indistinct, barely darker than ground (unnamed). Distributed in SE Kazakhstan and Kirgisia ..... **ogloblini** LOPATIN, 1953.
- . In male anal sternite without process ..... **6**.
6. Length under 3.5 mm. Here *hauseri* var. *perfectus* (antithesis 12).
- . Length over 4.0 mm ..... **7**.
7. Black discal stripes on elytra always well-developed. Aedeagus as in figs **934**, **935**. Length 4.2–4.8 mm (= *adustus* WEISE, 1890). Distributed in S Usbekistan, Tadjikistan and Turkmenistan ..... **bitaeniatus** SOLSKY, 1876.
- . Black distal stripes often divided, partly or entirely disappearing. General view as in plate XXIV, **phot. 208**. Aedeagus as in figs **936**, **937**. Length 4.2–4.8 mm. Distributed in Kazakhstan ..... **balassogloi** JACOBSON, 1895.

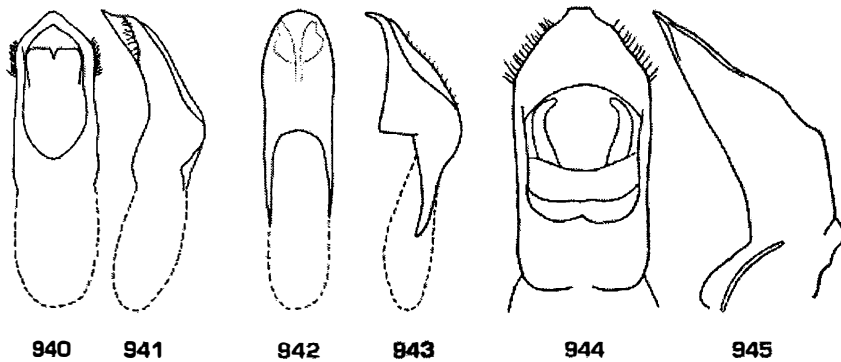


Figs 936-939. Apical half of aedeagus) in dorsal and lateral view (936, 937 after LOPATIN 1977; 938, 939 after LOPATIN 1980): 936, 937 – *Cryptocephalus (Asionus) balassogloi*; 938, 939 – *C. (A.) sarbazicus*.

8. Elytra with blackish common sutural stripe and with three (2, 1) black spots on each elytron. Here darkest forms of *volkovitshi* (thesis 19).
- . Each elytron with four (2, 2) great black spots often fused into two transverse, broad stripes. General view as in plate XXIII, **phot. 205**, **206**. Punctures of pronotum very strong, see plate XXIII, **phot. 207**. Aedeagus as in figs **985**, **986**. Length 3.5–4.6 mm. In Transcaspia forms subsp. *properus* WEISE, differing from nominotypical subspecies by aedeagus in lateral view not bent apically (figs **940**, **941**). Variation: black spots small, abdomen almost entirely testaceous (ab. *subpallidus* PIC, 1914). Distributed in Caucasian countries and in Iran ..... **rubi** MÉNÉTRIÉS, 1832.
9. On pronotum dark pattern ..... **10**.
- . Pronotum uniformly pale at most with small brownish dots or indistinct blurred darkenings ..... **13**.



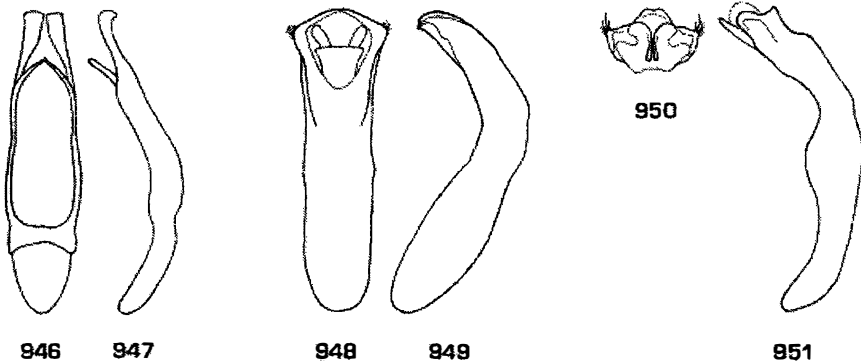
10. On pronotum black glasses-shaped pattern. Four species close allied to representatives of auxiliary group B ..... **11.**
- On pronotum one central U-shaped spot and on each side a lateral spot. In variations dark pronotal pattern much paler, rusty-brownish, but always distinct. Aedeagus as in figs **938, 939**. Length 3.0–3.3 mm. Described from Iran ..... **sarbazicus** LOPATIN, 1980.
11. Species from Caucasian countries. On average larger. Pattern on pronotum always dark. Ground of upper side and legs dark yellow. On elytra black humeral spot, partly blackish suffused primary punctures and traces of darker spots in anterior and postmedian area. Aedeagus as in figs **942, 943**. General view as in plate XXIV, **phot. 298**. Length 4.0–5.2. Distributed in Armenia and Azerbeidshan ..... **richteri** MEDVEDEV, 1957.
- Species from Transcaspia, on average smaller ..... **12.**



Figs 940-945. Aedeagus in dorsal or ventral and in lateral view (942, 943 after IABLOKOFF-KHNZORIAN 1983, remaining after LOPATIN 1977): 940, 941 – *Cryptocephalus (Asionus) rubi properusi*; 942, 943 – *C. (A.) richteri*; 944, 945 – *C. (A.) iskanderi*.

12. Species from Tadzhikistan and Kirgisia. Aedeagus as in figs **944, 945**. Pattern on pronotum often very pale, but with distinct outlines and always perceptible. In darker coloured specimens sutural margin and two large patches on each elytron blackish; in pale coloured specimens upper side almost uniformly rust-brownish or dark rust-yellowish. General view as in plate XXIV, **phot. 210**. Length 3.0–3.5 mm (male) to 3.7–4.3 mm (female). Distributed in mountains of Tian-Shan and Alai ..... **iskanderi** LOPATIN, 1961.
- Species from Kazakhstan. Aedeagus as in figs **946, 947**. Externally similar to *iskanderi* (thesis 12). Length 3.0–3.5 mm. Variation: pattern on pronotum darker, more distinct, on each elytron longitudinal broad blackish stripe, shortened before apical area (ab. *perfectus* WEISE, 1887). Distributed in S Kazakhstan ..... **hauseri** WEISE, 1887.

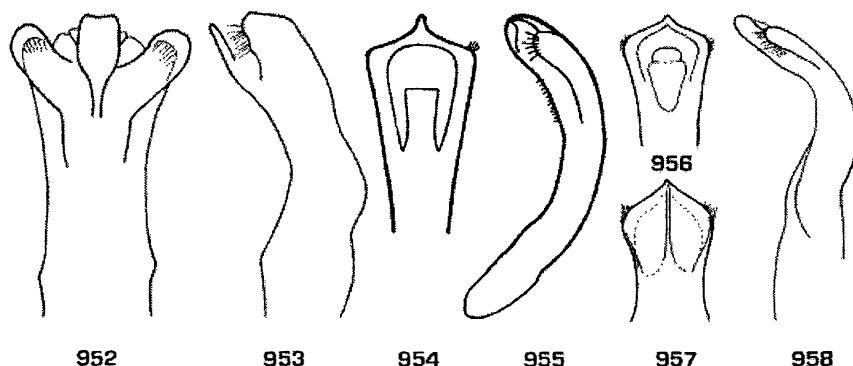
13. Underside dark, pitchy or blackish, margins of abdomen and pygidium often pale ...  
 ..... 14.  
 - Whole underside yellowish, rusty-reddish or brownish. Body elongate with parallel sides, elytra more than 1.4 × as long as (together) broad. Three species similar to each other from Transcaspiya, distinguishable mainly by shape of aedeagus and anal sternite in male ..... 22.



Figs 946-951. Aedeagus (or its apical part only) in dorsal and lateral view (950, 951 after LOPATIN and DOVGALLO 2002, remaining after LOPATIN 1977): 946, 947 – *C. (A.) hauseri*; 948, 949 – *Cryptocephalus (Asionus) atriplicis*; 950, 951 – *C. (A.) saryarkensis*.

14. Body elongate with parallel sides, elytra more than 1.4 × as long as (together) broad. Upper side yellow with numerous small black spots on head and pronotum. Five relatively small (length of body under 4.0 mm) species very similar to each other, distinguishable by dimorphic characters in male and shape of aedeagus ..... 15.  
 - Body less elongate, more stout, elytra at most 1.3 × as long as (together) broad ..... 19.  
 ..... 19.  
 15. Apex of aedeagus (figs 948, 949) in apical part gradually broadened, apex gently rounded without lamella or sharpening. Pygidium with black margins. Length about 3.0 mm. Female unknown. Distributed in Caucasian countries and in Central Asia ..... *atriplicis* LOPATIN, 1967.  
 - Apex of aedeagus sharpened or with lamella ..... 16.  
 16. In male anal sternite with deep impression, aedeagus with slightly but distinctly emarginate apical lamella ..... 17.  
 - In male anal sternite convex, without impression, very tip of aedeagus sharpened ..... 18.  
 ..... 18.  
 17. Impression on anal sternite in male large. Aedeagus as in figs 950, 951 Length 3.0–3.9 mm. Described from Kazakhstan ..... *saryarkensis* MEDVEDEV et KULENOVA, 1980.  
 - Impression on anal sternite in male rather small. Aedeagus as in figs 952, 953. Length 3.7–4.0 mm. Described from Kazakhstan ..... *prasolovi* LOPATIN, 1992.

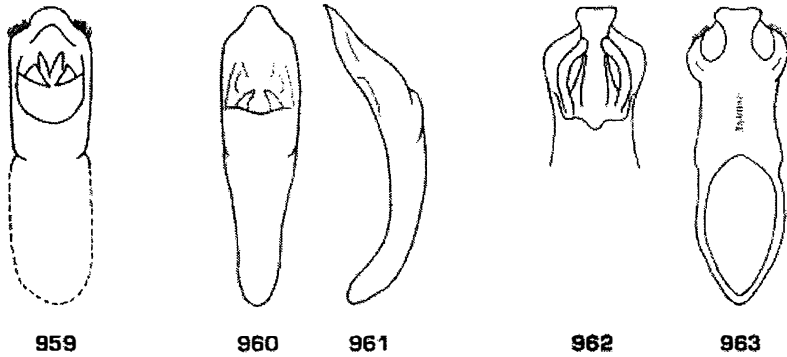
18. Median ridge on ventral side of aedeagus (figs **954**, **955**) elevated, well-visible in lateral view. Length 2.7–3.5 mm. Described from Kazakhstan ..... *kerzhneri* LOPATIN, 1968.
- Median ridge on ventral side of aedeagus (figs **956–958**) not elevated, feebly visible in lateral view. Length 2.8–3.7 mm. Distributed in Azerbeidshan and Georgia .... *zaitzevi* LOPATIN, 1977.



Figs 953-958. Aedeagus (or its apical part only) in dorsal and lateral view (952, 953 after LOPATIN 1992; 954, 955 after LOPATIN 1968; 956-958 after LOPATIN 1977): 952, 953 – *Cryptocephalus (Asionus) prasolovi*; 954, 955 – *C. (A.) kerzhneri*; 956, 957 – *C. (A.) zaitzevi*.

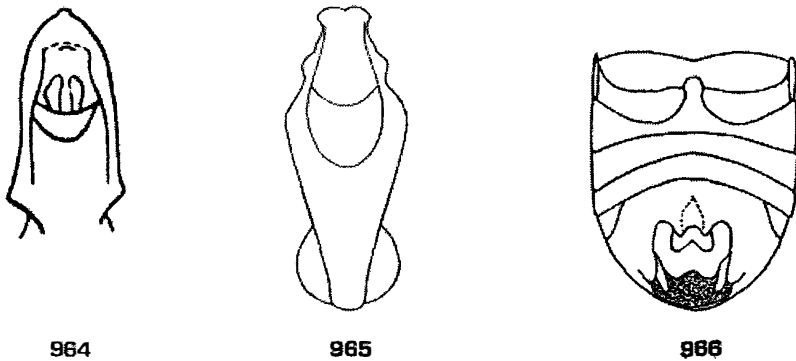
19. Pronotum very strongly, coarsely punctured. Scutellum black. In male anal sternite with bare, slightly impressed median area. General view as in plate XXIV, **phot. 211**. Aedeagus as in fig. **959**. Length 3.2–3.6 mm. Distributed in Caucasian countries ... *volkovitshi* LOPATIN, 1976.
- Pronotum densely, moderately strongly punctured ..... **20**.
20. Pronotum shorter, about 0.5 × as long as elytra, its sides rounded. Elytra ochraceous or yellowish testaceous, often with blurred brownish humeral spot and darkened sutural margin. Pronotum rust-reddish, scutellum pale ..... **21**.
- Pronotum longer, distinctly longer than 0.5 length of elytra, its sides almost straight, converging anteriorly. Upper side of pale coloured specimens almost uniformly rusty-reddish, with indefinite blurred darkenings on pronotum and elytra. Aedeagus as in figs **960**, **961**. Length 2.9–3.5 mm. Variations: dark colour sometimes stronger and more expanded, elytra entirely almost black, pronotum reddish pitchy (as in plate XXIV, **phot. 212**, unnamed). In darkest specimens elytra blackish, on pronotum also a large, blurred, central blackish area (unnamed). Described from Turkmenistan (Kopet-Dag mts.) ..... *verae* MEDVEDEV, 1956.
21. Species from Mesopotamia. Aedeagus as in figs **962**, **963**. Length 3.5 mm (male) to 4.0–4.2 mm (female). Described from Iraq ..... *linnavuorii* LOPATIN, 1985.
- Species from Transcaspia. Elytra yellowish-grey with darker spot on humeral callus, often also with darkened suture. Pronotum rusty-brownish with lightnings in basal

part. Punctuation of pronotum dense and strong, but relatively shallow. General view as in plate XXIV, **phot. 213**. Aedeagus as in fig. **964**. Length 2.7–4.5 mm. Distributed in SE Kazakhstan, E Uzbekistan, Kirgisia and Tadzhikistan. Here also pale forms of *iskanderi* (thesis 12), distinguishable by shape of aedeagus .....  
 ..... **globulus** LOPATIN, 1953.



Figs 959-963. Aedeagus (or its apical part only) in dorsal and lateral view (959 after LOPATIN 1976; 960, 961 after LOPATIN and DOVGAILO 2002; 962, 963 after LOPATIN 1985): 959 – *Cryptocephalus (Asionus) volkovitshi*; 960, 961 – *C. (A.) verae*; 962, 963 – *C. (A.) linnavuorii*.

22. On elytra in apical part transverse band slightly darker than ground. Aedeagus as in figs **888, 889**. See *tamaricis*, auxiliary group B, thesis 3.  
 -. In hind part of elytra no traces of transverse band ..... **23**.



Figs 964-966. Aedeagus (or its apical part only) in dorsal and lateral view (964 after MEDVEDEV 1982; 965, 966 after LOPATIN 1977): 964 – *Cryptocephalus (Asionus) globulus*; 965, 966 – *C. (A.) wittmeri*.

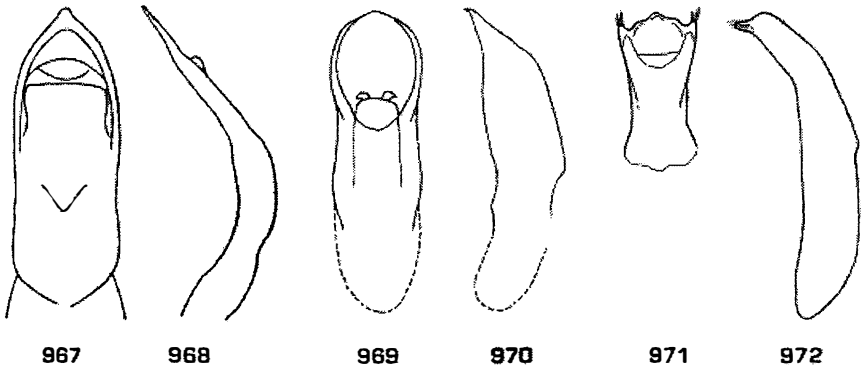
23. Apex of aedeagus with double rounding (fig. 965). Anal sternite in male with large excavation (fig. 966). Length 3.2–3.6 mm. Described from N Iran ..... *wittmeri* LOPATIN, 1977.
- . Apex of aedeagus sharpened or with very small median lamella (figs 967, 968). Anal sternite in male simple, apically rounded, without excavation or lamella. Length 3.0–4.5 mm (= *simulator* LOPATIN, 1971, nec Gressitt, 1942). Distributed in Kazakhstan ..... *jaxarticus* LOPATIN, 1986.

Auxiliary group E

Puncturation of elytra arranged in rows, pronotum finely or feebly punctate.

Key to species

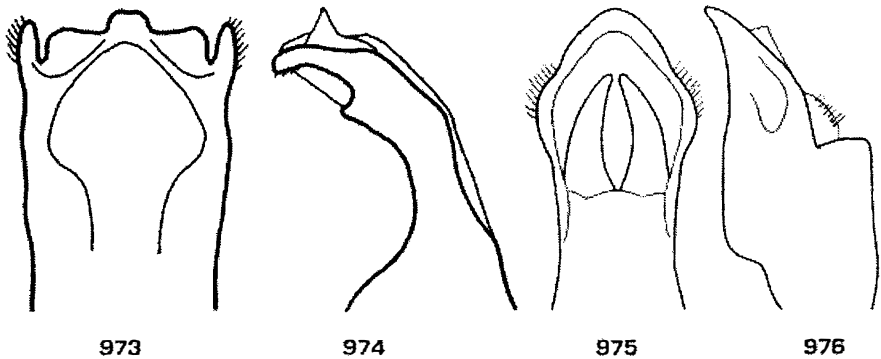
1. Pronotum black, elytra pale yellow, on each elytron longitudinal, broad stripe running along lateral margin and common sutural stripe black. Sutural stripe more or less gradually widened anteriad, never distinctly forked. On elytra inner rows of punctures strong, deep and regular, punctures usually suffused with blackish. Pronotum hairless, on elytra only apical area sparsely covered with very short hairs. General view as in plate XXIV, **phot. 214**. Aedeagus as in figs 969, 970. Length 2.9–3.3 mm (= *araxidis* WEISE, 1898). Distributed in east-northern Turkey and in Caucasian countries ..... *curda* JACOBSON, 1897.
- . Pronotum at least partly pale, on elytra no longitudinal black stripes ..... 2.



Figs 967-972. Aedeagus in dorsal and lateral view (967, 968 after LOPATIN 1986; 969, 970 after SASSI 2000; 971, 972 after LOPATIN and DOVGAILO 2002): 967, 968 – *Cryptocephalus (Asionus) jaxarticus*; 969, 970 – *C. (A.) curda*; 971, 972 – *C. (A.) acupunctatus*.

2. Upper side almost entirely pale, without dark pattern, at least with blurred darkenings ..... 3.
- . Upper side with black pattern ..... 4.

3. Upper side yellow; on humeral callus indistinct brownish spot, five apical antennomeres black, apical part of tibiae and tarsi more or less darkened. See *vitellinus* (auxiliary group B, thesis 2).
- . Upper side pale testaceous or darker rust-yellow, with blurred darkenings on pronotum and in hind part of elytra. Body somewhat elongate, with parallel sides. General view as in plate XXIV, **phot. 215**. Aedeagus as in figs **971, 972**, Length 3.8–4.3 mm (= *acupictus* MARSEUL, 1875). Distributed in Algeria ..... ***acupunctatus*** FAIRMAIRE, 1873.
4. Black pattern on pronotum and elytra strongly contrasting on pale yellow ground. On pronotum great black pattern in form of theater mask, on each elytron four (2, 2) large black spots, antennae and legs yellowish, scutellum and sutural margin black. General view as in plate XXIV, **phot. 216**. Aedeagus as in figs **973, 974**. Length 3.6–4.5 mm. Described from Iran ..... ***irenae*** LOPATIN, 1980.
- . Ground of upper siderust red or dark orange. Black pattern with somewhat blurred margins, not strongly contrasting on paler ground ..... 5.



Figs 973-976. Apical part of aedeagus in dorsal or ventral and in lateral view, abdomen (after LOPATIN 1977): 973, 974 – *Cryptocephalus (Asionus) irenae*; 975, 976 – *C. (A.) medvedevi*.

5. Elytra about 1.6 × longer than pronotum and distinctly longer than (together) broad. On pronotum in pale specimens dark rust-brownish glasses-shaped pattern and usually a narrow, shortened median black stripe, on elytra 3 (2, 1) or 2 (humeral and postmedian) spots. In dark coloured specimens black colour expanded, in darkest specimens upper side mainly black with reddish pattern on pronotum and with reddish basal and marginal stripes on elytra. General view as in plate XXV, **phot. 217**. Aedeagus as in figs **975, 976**. In male first tarsomere of fore legs as broad as apical part of corresponding tibia. Length 3.5–4.8 mm (= *lopatini* LABLOKOFF-KHNZORIAN, 1963). Distributed in Afghanistan and Tadjikistan ..... ***medvedevi*** LOPATIN, 1953.
- . Elytra short, about 1.4 × longer than pronotum and feebly longer than (together) broad. Upper side coloured similar as in *medvedevi*, but specimens coloured mainly

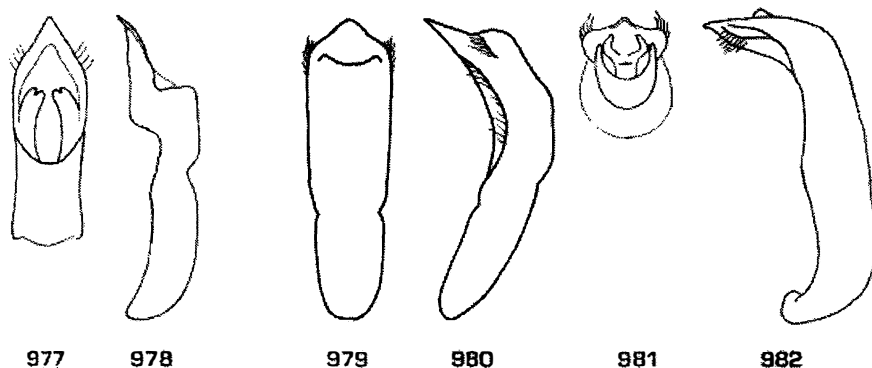
black are not known. Usually on each elytron three (2, 1) black spots and common black sutural stripe. General view as in plate XXV, **phot. 218**. Aedeagus as in figs 977, 978. Known from Turkmenistan and Afghanistan ..... **spurius** LOPATIN, 1956.

### Auxiliary group F

Punctuation of elytra irregular or semiregular, pronotum strongly punctate.

#### Key to species

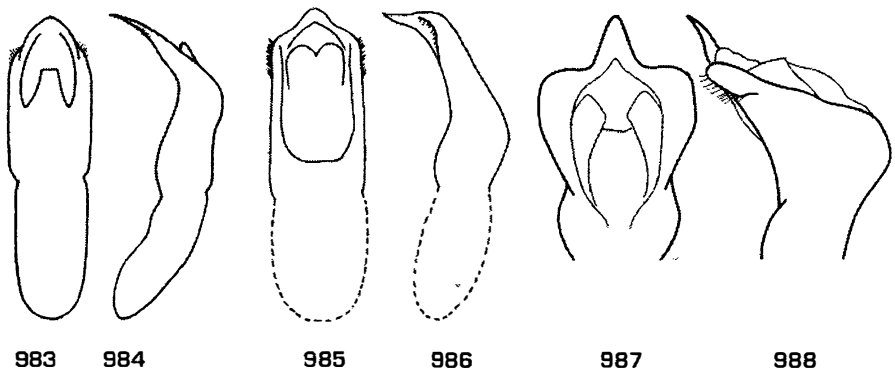
1. Pronotum rust-reddish, elytra pale testaceous, his apical part and lateral margins ivory yellowish. Length 2.5–3.2 mm. Here immature specimens of *lateralis* (auxiliary group A, thesis 10).
  - Upper side differently coloured ..... **2.**
2. Elytra pale yellowish with longitudinal black stripes reaching almost to apex: on each elytron discal stripe and common sutural stripe ..... **3.**
  - On elytra no three longitudinal black stripes ..... **4.**



Figs 977-982. Aedeagus (or its apical part only) in dorsal and lateral view (979, 980 after WARCHALOWSKI 1991, remaining after LOPATIN and DOVGAILO 2002): 977, 978 – *Cryptocephalus (Asionus) spurius*; 979, 980 – *C. (A.) bohemicus*; 981, 982 – *C. (A.) altaicus*.

3. Sutural stripe not forked. Pronotum black with yellow: anterior and lateral margins, shortened median stripe and two spots before scutellum. General view as in plate XXV, **phot. 220**. Punctures of pronotum very dense and deep, but not particularly strong. Aedeagus as in figs 979, 980. Length 4.0–4.7 mm (= *semenowi* WEISE, 1889, *tentator* WEISE, 1889). Variation: two yellow spots on pronotum absent (ab. *bohemi* GERMAR, 1824). Distributed in Austria, Hungary, Ukraine, southern Russia, Siberia and Mongolia ..... **bohemicus** DRAPIEZ, 1819.

- Sutural stripe in anterior part of elytra forked. Pronotum black with yellowish lateral and anterior margins, legs pale, tarsi and apical part of antennae darkened or blackish. General view as in plate XXV, **phot. 219**. Aedeagus as in figs **981, 982**. Length 2.6–3.7 mm (= *trivittatus* GEBLER, 1830, nec OLIVIER, 1808, *agnus* WEISE, 1898, *clavaceus* CSIKI, 1916). Distributed in Mongolia and in Siberia from Altai to Transbaicalia ..... **altaicus** HAROLD, 1872.
- 4. On each elytron two black spots (humeral and postbasal) and two narrow longitudinal stripes behind middle. Both postmedian stripes often fused with humeral spot, forming approximately the Greek letter "gamma". Pronotum pale yellowish with large M-shaped black pattern. General view as in plate XXV, **phot. 222**. Femora bicolorous. Hairs covering posterior part of elytra distinct. Aedeagus as in figs **983, 984**. Length 4.2–4.7 mm (= *sesquistriatus* KRYNICKI, 1834, *epsilon* SUFFRIAN, 1847). Variations: femora almost entirely black with yellowish apical spot only (ab. *semilugens* DUDICH, 1924), femora as in *semilugens*, on pronotum laterally additional little black spot (ab. *maculipes* ZOUBKOFF, 1833). Distributed in Slovakia, Hungary, Bulgaria, Romania, Ukraine and basin of Volga ..... **gamma** HERRICH-SCHÄFFER, 1829.
- Elytra differently coloured ..... **5**.
- 5. Pronotum rust-reddish, elytra pale testaceous, its apical part and lateral margins ivory yellowish. Length 2.5–3.2 mm. Here immature specimens of *lateralis* (auxiliary group A, thesis 10).
- Upper side differently coloured ..... **6**.
- 6. Pronotum black with yellow: anterior and lateral margins, shortened median stripe and two large, oblique spots in hind part. Elytron dark yellow or orange with four (2, 2) great black spots sometimes fused into two transverse, broad, somewhat irregular stripes ..... **7**.
- Pronotum reddish in anterior half with two elongate black spots, sometimes partly reduced and divided into two pairs of smaller spots ..... **8**.



Figs 983–988. Aedeagus in dorsal and lateral view (983, 984 after WARCHAŁOWSKI 1991; 985, 986 orig.; 987, 988 after LOPATIN 1977): 983, 984 – *Cryptocephalus (Asionus) gamma*; 985, 986 – *C. (A.) rubi*; 987, 988 – *C. (A.) oxianus*.



7. Elytral spots irregular, with blurred margins. Aedeagus as in figs **985, 986**. Punctures of pronotum very strong. See *rubi*, auxiliary group D, antithesis 8.
- Elytral spots roundish with well-defined margins. Aedeagus as in figs **987, 988**. Length 3.6–4.4 mm. Described from Tadzhikistan ..... **oxianus** LOPATIN, 1975.
8. Larger. Legs black or black with yellowish spot in apical part of femora, mesoepimera partly yellowish. Length 5.0–6.0 mm (= *halophilus* SUFFRIAN, 1847, nec GEBLER, 1830). General view as in plate XXV, **phot. 221**. Aedeagus as in figs **989, 990**. Melanotic variation: body black, anterior and lateral margins of pronotum, lateral and apical margin of elytra and two little spots at scutellum reddish (ab. *aipetrensis* MEDVEDEV, 1956). Distributed in Crimea, southern Russia and in Siberia ..... **floralis** KRYNICKI, 1834.
- Smaller. Legs pale with darkened or blackish tarsi, sometimes also with slightly darkened apices of tibiae and femora. General view as in plate XXV, **phot. 223**. Aedeagus as in figs **991, 992**. Body relatively slender. Upper side yellow or light orange, on pronotum normally four black spots, often additionally two black dots at posterior margin; sometimes lateral spot absent and both median spots interrupted. Elytron with two black spots anteriorly and two before apex, usually separated by a whitish longitudinal stripe. Length 4.2–4.6 mm (= *suffriani* DOHRN, 1859, nec SUFFRIAN, 1849). Distributed in basin of Volga and in nord-eastern part of Central Asia ..... **beckeri** MORAWITZ, 1860.

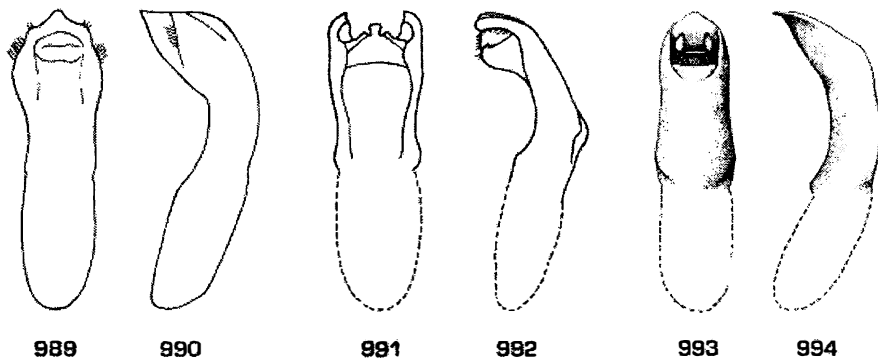
#### Auxiliary group G

Puncturation of elytra irregular or semiregular, pronotum strongly punctate.

#### Key to species

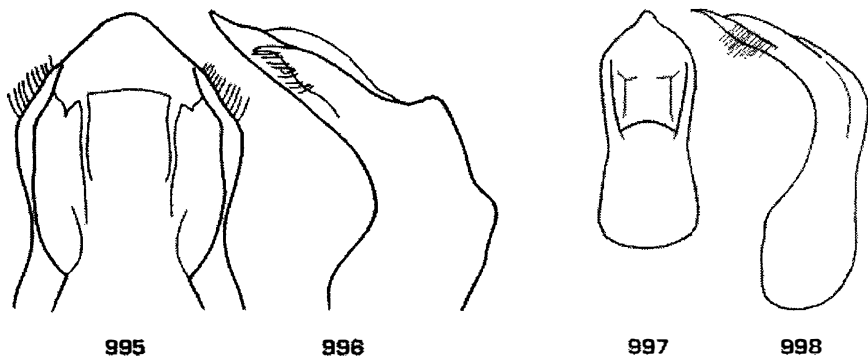
1. Pronotum black, in both sexes with six orange spots as in plate XXXVII, **phot. 327**: two broad lateral stripes, two discal spots, one anterior and one prescutellar spot. See *spilothorax* JACOBSON, 1924 (subgenus *Cryptocephalus* s. str., auxiliary group H, thesis 10), in opinion of some authors belonging to subgenus *Asionus*.
- Pronotum differently coloured ..... **2**.
2. Pronotum yellowish with theatre mask- or M-shaped (sometimes partly reduced) black pattern ..... **3**.
- Pronotum differently coloured ..... **5**.
3. Body length over 4.3 mm. Species from Iberian Peninsula. Elytra pale yellow with blackish humeral spot. Punctures darkened, sometimes here and there fused into indistinct short longitudinal stripes. General view as in plate XXV, **phot. 224**. Hairs covering posterior part of elytra very short, barely visible. Aedeagus as in figs **993, 994**. Length 4.3–5.1 mm. Occurs in Spain ..... **ingamma** PIC, 1908.
- Body length 3.0–4.0 mm. Asiatic species ..... **4**.
4. Upper side dark yellow, elytra pale with four (2, 2) black spots. Legs and antennae entirely dark yellow or with feeble darkenings. Length 3.4–4.0 mm. M-shaped black pattern of pronotum usually interrupted laterally. Aedeagus as in figs **995, 996**. Species from Tadzhikistan ..... **hammadae** LOPATIN, 1961.
- Ground of upper side pale yellow. On elytra sutural stripe not reaching to apex and three transverse bands (basal, median and apical) black. Anal band usually

shortened or interrupted. Antennae pale, legs yellow with partly black femora, in darker coloured specimens also tarsi and antennomeres 5–11 brown or blackish. General view as in plate XXV, **phot. 225**. Aedeagus as in figs **997, 998**. Length 3.0–4.0 mm (= *equestris* GEBLER, 1830, *manchuricus* GRESSIT et KIMOTO, 1961, *dariganicus* MEDVEDEV, 1979). Variation: apical black band on elytra absent, median band strongly shortened, basal band interrupted, whole lateral parts of elytra yellow (unnamed). Distributed from NE Kazakhstan and Altai to Mongolia, Transbaicalia, Amur- and Ussuri basins ..... **crux** GEBLER, 1830.



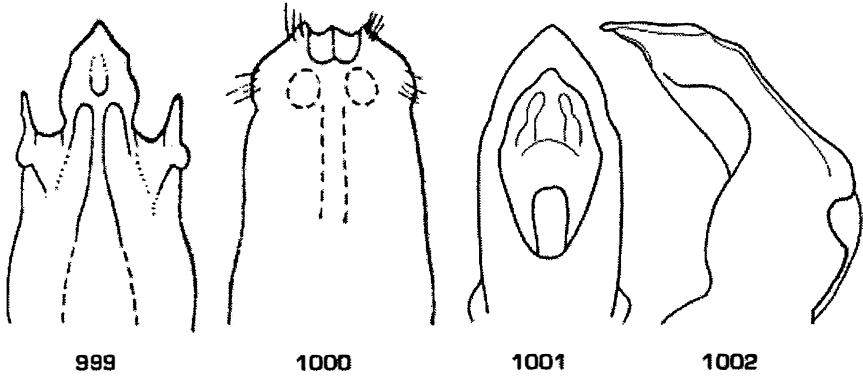
Figs 989-994. Aedeagus in dorsal and lateral view (989, 990 after WARCHALOWSKI 1991; 991, 992 after LOPATIN 1977; 993, 994 after PETITPIERRE 2000): 989, 990 – *Cryptocephalus (Asionus) floralis*; 991, 992 – *C. (A.) beckeri*; 993, 994 – *C. (A.) ingamma*.

- 5. Pronotum entirely black or black, with pale stripes along anterior margin and near hind angles ..... 6.
- . Pronotum black with pale pattern on disc or yellowish-reddish with black spots ..... 16.



Figs 995-998. Aedeagus in dorsal and lateral view (after LOPATIN 1977): 995, 996 – *Cryptocephalus (Asionus) hammadae*; 997, 998 – *C. (A.) crux*.

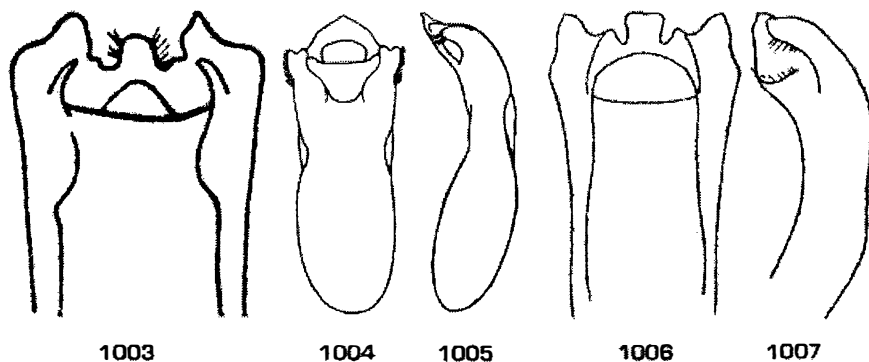
6. Elytra uniformly pale, pronotum black or black with pale lateral borders, legs dark. Here forms of *cunctatus* (auxiliary group A, thesis 6) without distinct metallic reflex on pronotum.
- Upper side differently coloured ..... 7.
7. At upper/inner margin of each eye a rather large, yellow spot. Here darkest forms of *mniszewski* (antithesis 34).
- At inner margin of eyes no yellow spot or sometimes a very small yellow dot ..... 8.
8. Body entirely black except dark red epipleura and very narrow marginal stripe on elytra. Here rather rare melanotic forms of *stchukini* (thesis 30).
- At least anterior margin of pronotum and apical marginal stripe on elytra pale ... 9.
9. Elytra almost entirely black or black with narrow marginal and discal stripes or generally yellowish-reddish with 2-4 narrow longitudinal stripes ..... 10.
- On elytra no narrow longitudinal stripes ..... 12.
10. Pygidium of female with longitudinal ridges or convexities ..... 11.
- Pygidium of female without longitudinal convexities or ridges. Here melanotic form of *bidentatus* (thesis 41).



Figs 999-1002. Apical half of aedeagus in dorsal and lateral view (1001, 1002 after LOPATIN 1977, remaining after MEDVEDEV 1982): 999 – *Cryptocephalus (Asionus) korotjaevi*; 1000 – *C. (A.) bidentulus*; 1001, 1002 – *C. (A.) halophilus*.

11. Pygidium of female on hind margin emarginate and with two longitudinal ridges, separated by a rather broad furrow. Forms two subspecies: elytra almost entirely black (nominotypical subspecies, from NW Mongolia), ground of elytra pale with longitudinal black stripes (subsp. *shamoensis* MEDVEDEV, 1980 from W and S Mongolia). Aedeagus as in fig. 999. Length 4.7-5.8 mm. Distributed in Mongolia, Altai and Sajon mountains ..... **korotjaevi** MEDVEDEV, 1980.
- Pygidium of female on hind margin straight or rounded, not emarginate. Along the middle of pygidium run an obtuse longitudinal convexity, often with narrow median furrow. Aedeagus as in fig. 1000. General view as in plate XXVI, **phot. 227** and **228**. Forms two subspecies: elytra almost entirely black (nominotypical subspecies from

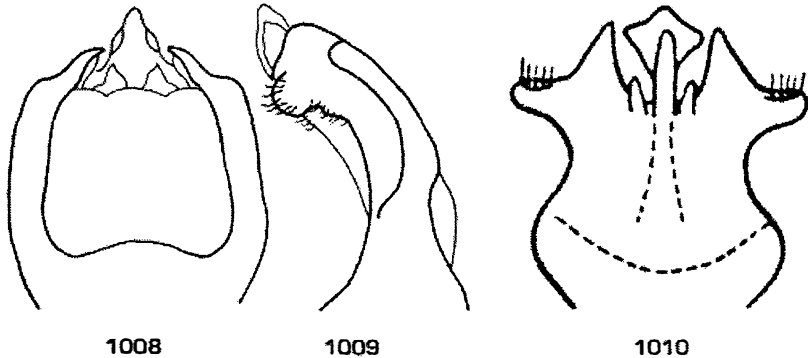
- Tuva and Central Mongolia), on average smaller, elytra blackish with pale lateral margins and pale apical area (subsp. *klementzi* OGLOBLIN, 1956 from NW Mongolia and Tuva), elytra generally pale, yellowish, with narrow longitudinal stripes (subsp. *subdesertus* MEDVEDEV, 1980 from S Mongolia). Length 4.0–5.3. Distributed in Mongolia and in Baikal area ..... *bidentulus* SUFFRIAN, 1854.
12. Lateral sides of pronotum feebly rounded, outline of pronotum not semicircular. In anterior part narrow, median yellow stripe, in hind part two separate transverse yellow spots. On each elytron four (2, 2) large, roundish, black spots with somewhat blurred margins, usually forming two transverse (basal and preapical) bands. Inner spots always fused with suture, outer spots usually free, but sometimes fused into a longitudinal stripe ..... 13.
- . Lateral sides of pronotum rounded, outline of pronotum semicircular ..... 14.
13. In male on basal margin of anal sternite central process forked or incised apically. Here dark variation of *diadochus* (thesis 29).
- . In male on each lateral margin of anal sternite large tooth. General view as in plate XXVI, phot. 226. Aedeagus as in figs 1001, 1002. Length 4.3–5.6 mm (= *skopini* LOPATIN, 1961). Distributed in Kazakhstan and Altai ..... *halophilus* GEBLER, 1830.
14. On average smaller (4.0–5.0 mm). Tibiae in great part and femora partly red. Upper side black with reddish anterior and lateral margins of pronotum, narrow lateral margins and apical part of elytra. Here darkest forms of *bidentatus* (thesis 41).
- . On average larger (4.8–6.5 mm). Legs black, sometimes with yellowish spot in apical part of femora ..... 15.
15. Legs always black. Very tip of aedeagus triangular. In anterior part of pronotum narrow, median orange stripe fused with a larger orange spot before scutellum. On each elytron four (2, 2) black spots, usually free, sometimes partly fused, more rarely expanded. In the last case elytra are black with marginal and apical borders reddish. Length 4.8–6.5 mm. Dark colour variations of *stschukini*, antithesis 30.
- . Legs often with pale yellowish spot before apex of femora. Very tip of aedeagus transversely cut. Here dark variation (ab. *aipetrensis*) of *floralis* (auxiliary group F, thesis 8).



Figs 1003-1007. Aedeagus in dorsal and lateral view (1003 after MEDVEDEV 1982; 1004, 1005 after LOPATIN 1977; 1006, 1007 after LOPATIN 1990): 1003 – *Cryptocephalus (Asionus) stackelbergi*; 1004, 1005 – *C. (A.) coronatus*; 1006, 1007 – *C. (A.) klarae*.

16. Ground of upper side dark yellow, orange or red, usually red. On pronotum two black spots in anterior half and two at hind margin. Often the spots on each side fused, median longitudinal stripe (usually larger before scutellum and sometimes with a black central dot) similarly as narrow lateral and anterior margins remain reddish. On each elytron four (2, 2) black spots. Hind spots, situated obliquely, form an arched row, approximately parallel to apical margin of elytra. General arrangement of these patterns as in **phot. 229–237** (plates XXVI and XXVII). Here almost twenty species and several subspecies, similar to each other, not always distinguishable by external characters, but differing by shape of aedeagus ..... **17.**
- Species coloured differently ..... **31.**
17. Pronotum short and broad, 1.6–1.8 × broader than long, broadly rounded ..... **18.**
- Pronotum longer, distinctly narrowed anteriorly ..... **22.**
18. On average smaller, length 5.0–6.4 mm ..... **19.**
- On average larger, length 5.5–7.0 mm ..... **21.**
19. In male anal sternite with very deep impression, with two large, obtuse teeth at basal margin. Body elongate, subparallel. Aedeagus as in fig. **1003**. General view as in plate XXVI, **phot. 229**. Length 5.0–5.5 mm. Variations: on elytra inner preapical spot absent (unnamed). Distributed in Central and E Kazakhstan ..... **stackelbergi** LOPATIN, 1971.
- In male anal sternite with not moderately deep or shallow impression ..... **20.**
20. Body stout. In male anal sternite with one small, median tooth or tubercle at basal margin. Body stout. General view as in plate XXVI, **phot. 230**. Aedeagus as in figs **1004, 1005**. Puncturation of elytra entirely random, without traces of longitudinal stripes. Length 5.5–6.4 mm. Rather broadly distributed from Crimea to SE Kazakhstan and Kirgisia ..... **coronatus** SUFFRIAN, 1847.
- Body more elongate, somewhat parallel, body outline approximately as in *stackelbergi* (thesis 18). In male anal sternite with two very small and ill-perceptible tooth. Ground of upper side red brick or dark orange. Head black with yellow clypeus and two large spots on frons. On pronotum four black spots (inner spots much larger than outer spots) and two less distinct at basal margin. On each elytron four rather small spots. Legs partly reddish. Aedeagus as in figs **1006, 1007**. Length 4.7–5.3 mm. Distributed in SE Kazakhstan ..... **klarae** LOPATIN, 1990.
21. Frons black. Femora and tibiae rust-red. Four black spots on pronotum form a transverse row (inner spots larger). Aedeagus as in figs **1008, 1009**. Length 6.0–7.0 mm (= *kiritschenkoi* JACOBSON, 1925, *negligens* WEISE, 1992 nec WEISE, 1882). Distributed rather broadly in Transcaspia, known from different parts of Kazakhstan, from E Uzbekistan, Kirgisia and Tadzhikistan ..... **kokanda** JACOBSON, 1924.
- Frons with yellow spots at eyes. Femora black with whitish spot before apex. Length 6.0–7.0 mm. General view as in plate XXVI, **phot. 231**. Forms several local races, ranked as subspecies, differing mainly by shape of aedeagus: tibiae black, whitish spots on femora usually reduced or absent. Aedeagus as in fig. **1010** (nominotypical subspecies from Tadzhikistan and S Kirgisia), colouring of legs as in nominotypical subspecies (subsp. *talassicus* LOPATIN, 1976 from Talass and Karzhantau mountains in Kirgisia), colouring of legs as in nominotypical subspecies (subsp. *narynensis* LOPATIN, 1976 from Ferganskij range), tibiae at least partly reddish, tarsi reddish (subsp. *tiro* LOPATIN, 1976 from Central Tian-Shan), tibiae at least partly reddish, tarsomeres 2–4 black, spots on pronotum small, free (subsp. *iliensis* WEISE, 1900,

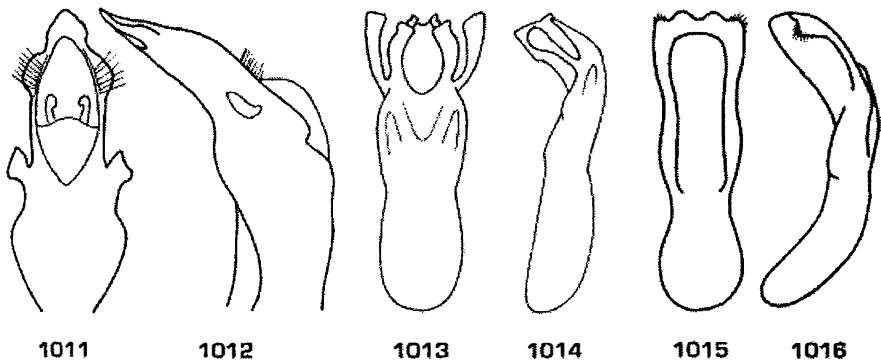
distributed north of Aral mountains, aedeagus as in fig. **1056**), spots on pronotum large, usually fused, body more slender, inner preapical spots on elytra reduced, usually absent (subsp. *betpakdalensis* LOPATIN, 1967 from Betpak-Dala Steppe in Kazakhstan), body robust, inner preapical spots on elytra well-developed (subsp. *grumi* LOPATIN, 1976 from E Kazakhstan, aedeagus as in fig. **1055**), tibiae reddish apically (subsp. *stenroosi* JACOBSON, 1901 from Karatau mountains in Kazakhstan and Kirgizskij Alatau mountains in Kirgisia) ..... *sarafschanensis* SOLSKY, 1882.



Figs 1008-1010. Apical part of aedeagus in dorsal and lateral view (1008, 1009 after LOPATIN 1977; 1010 after MEDVEDEV 1982): 1008, 1009 – *Cryptocephalus (Asionus) kokanda*; 1010 – *C. (A.) sarafschanensis*.

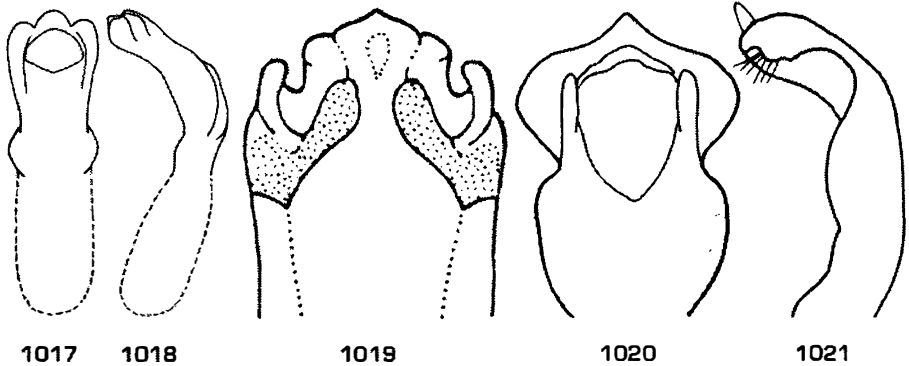
22. In female pygidium lateroapically with two deep hollow. In male anal sternite with two large, apically incised teeth. Aedeagus as in figs **1011**, **1012**. General view as in plate XXVI, **phot. 232**. Length 4.5–5.5 mm. Distributed in N Kazakhstan ..... *impressipygus* OGLOBLIN, 1956.
- . In female pygidium differently shaped ..... **23**.
23. Pygidium of female with two deep and large longitudinal furrows. In male anal sternite with two large, obtuse, flattened teeth. Head, legs, underside and sutural stripe black. Upper side red with black pattern, usually as in plate XXVI, **phot. 233**. In male fore legs elongate, first tarsomeron of mid legs broad, laterally flattened. Aedeagus as in figs **1013**, **1014**. Length 6.0–7.2 mm (*bidens* SUFFRIAN, 1871). Variations: black elytral pattern extended, mid part of elytron black (ab. *disconiger* PIC, 1904), on elytron preapical black stripe interrupted (ab. *missisiensis* PIC, 1908). Distributed in western Syria and in southern Turkey ..... *tappesi* MARSEUL, 1868.
- . Pygidium of female without deep and large furrows ..... **24**.
24. Apical process of aedeagus (figs **1015**, **1016**). emarginate General view as in plate XXVI, **phot. 234**. Pronotum usually with six (4, 2), each elytron with four (2, 2) black spots. Several colour aberrations were described. Length 4.8–5.8 mm (= *coloratus* FABRICIUS, 1798, = *pilleri* SCHRANK, 1798). Distributed in basin of Danube, Bulgaria and Ukraine ..... *quatuordecimmaculatus* SCHNEIDER, 1792.
- . Apical process or lamella of aedeagus not emarginate ..... **25**.

25. Body relatively large and broad, also in males, length 5.4–7.4 mm ..... **26.**  
 -. Body smaller and more narrow, particularly in males ..... **27.**
26. Elytra with small black spots (2, 2), outer spots larger than inner. Legs partly red. Inner spots sometimes disappear, rarely humeral spot present only. Pronotum with 2 rather large black spots and often with additional 2 or 4 spots forming transverse row; sometimes also two spots at hind margin. Anal sternite in male with a shallow impression and with a very small central tubercle at basal margin. General view as in plate XXVII, **phot. 235**. Aedeagus as in figs **1017**, **1018**. Length 5.4–6.8 mm (= *nigritarsis* SUFFRIAN, 1847). Variations: on elytron one small black spot only (ab. *kelecsenyi* PIC, 1909), on each elytron three spots (2, 1) (ab. *uralskeinsis* PIC, 1908), on elytron one spot on humerus and suture narrowly black (ab. *ottoi* PIC, 1908), legs pale with blackish tarsi (ab. *nigritarsis* Suffrian Rather broadly distributed in Transcaspia, from W Kazakhstan to Tian-Shan ..... *flavicollis* FABRICIUS, 1781.
- . Elytra with large black spots (2, 2), hind spots sometimes fused into transverse band. Legs black. Aedeagus as in fig. **1019**. Anal sternite in male with a moderately large impression and with a small, short, elongate central process at basal margin. Externally very similar to dark variations of *pelepterus* (*Cryptocephalus* s. str., auxiliary group K, thesis 5). Length 5.8–7.4 mm. Distributed in Mongolia and N China ..... *jansoni* BALY, 1877.
27. Impression on anal sternite in male with two teeth or spikes at basal margin. Punctures of elytra suffused with black ..... **28.**  
 -. Impression on anal sternite in male with one process or tubercle at basal margin, sometimes with longitudinal ridge ..... **29.**
28. Inner margin of eye with yellowish stripe. Pygidium black with yellow apical border. Teeth at basal margin of anal sternite in male very distant. Aedeagus as in figs **1020**, **1021**. Length 4.4–5.5 mm. Distributed in SE Kazakhstan ..... *terminassianae* LOPATIN, 1967.  
 -. Inner margin of eye without yellow stripe. Aedeagus as in figs **1022**, **1023**. Length 4.3–5.0 mm. Distributed in Kirgisia ..... *personatus* WEISE, 1892.



Figs 1011-1016. Aedeagus in dorsal and lateral view (1011, 1012 after LOPATIN 1977; 1013, 1014 after SASSI and KISMALI 2000; 1015, 1016 after WARCHALOWSKI 1991): 1011, 1012 – *Cryptocephalus (Asionus) impressipygus*; 1013, 1014 – *C. (A.) tappesi*; 1015, 1016 – *C. (A.) quatuordecimmaculatus*.

29. Process at basal margin of anal sternite in male incised or almost forked apically ...  
 ..... 30.  
 - Process at basal margin of anal sternite in male with small triangular tooth. On frons between eyes a very pale, almost white spot. Length 5.5 mm. Aedeagus not studied. An insufficiently studies species from Transcaspia, known from Kirgisia only; in opinion of some authors possibly a subspecies of *sarafschanensis* (antithesis 20) ...  
 ..... **placidus** WEISE, 1892.

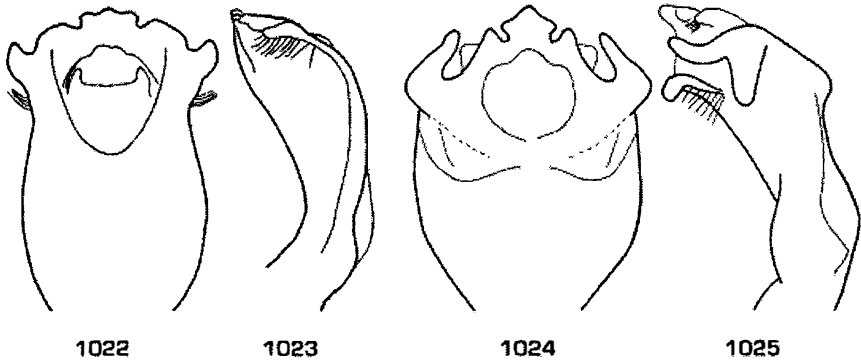


Figs 1017-1021. Aedeagus or its apical part in dorsal and lateral view (1019 after MEDVEDEV 1982, remaining after LOPATIN 1977): 1017, 1018 – *Cryptocephalus (Asionus) flavicollis*; 1019 – *C. (A.) jansoni*; 1020, 1021 – *C. (A.) terminassianae*.

30. Aedeagus as in figs **1024**, **1025**. Variation: pronotum black with lateral and anterior margins yellow. Length 4.8–5.6 mm. Distributed in Tadzhikistan ..... **diadochus** LOPATIN, 1963.  
 - Aedeagus as in figs **1026**, **1027**. General view as in plate XXVII, **phot. 236**. Forms two subspecies: somewhat smaller, length 4.4–5.3 mm, ventral ridge of aedeagus sharp (nominotypical subspecies from S Kazakhstan), somewhat larger, length 4.8–5.5 mm, ventral ridge of aedeagus obtuse (subsp. *sogdianus* LOPATIN, 1963 from E Uzbekistan and Tadzhikistan) ..... **arnoldii** MEDVEDEV, 1956.  
 31. Species from Asia Minor ..... 32.  
 - Species from NE Asia. General view as in plate XXVII, **phot. 237**. Aedeagus as in fig. **1028**. Variation: body entirely black with dark red epipleura and lateral margin of elytra (unnamed, see thesis 14). Length 4.8–6.6 mm. Distributed in E Siberia, Mongolia, Transbaicalia and NE China ..... **stschukini** FALDERMANN, 1835.  
 32. Underside and legs entirely black. Humeral black spot distant from anterior margin of elytra, humeral callus at least partly red. Body large, parallel, convex. In male fore legs elongate, first tarsomeron of mid legs broad, laterally flattened, last abdominal sternite with two broad lamella at base. Here pale variations of *tappesi* (thesis 22).  
 - Legs black, mesoepimeres yellow. Humeral black spot cover humeral callus. In male last abdominal sternite with a single little sharp tooth at base. Coloration of upper

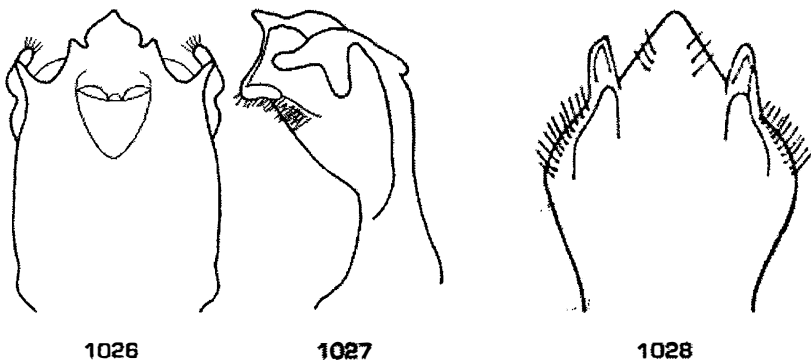


side as in *reitteri* (antithesis 40). Aedeagus as in figs 1029, 1030. Described from Turkey, based on one specimen only ..... *pseudoreitteri* TOMOV, 1976.



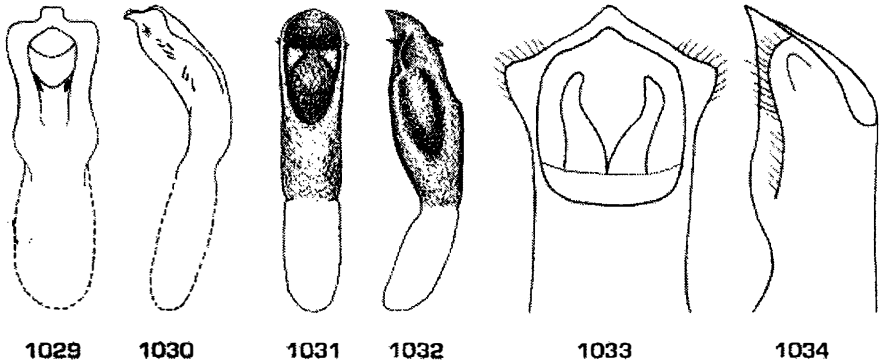
Figs 1022-1025. Apical half of aedeagus in dorsal and lateral view (after LOPATIN 1977): 1022, 1023 – *Cryptocephalus (Asionus) personatus*; 1024, 1025 – *C. (A.) diadochus*.

33. Pronotum with irregular pattern, formed by blackish or dark brown dots and yellowish interstices. Elytra yellowish with darkened punctures and irregular brownish spots. General view as in plate XXVII, phot. 238. Aedeagus as in figs 1031, 1032. Length 3.4–4.0 mm (= *mroczkowskii* WARCHAŁOWSKI, 1997). Described from Algeria .....  
 ..... *limoniastri* PIC, 1894.  
 -. Pattern on pronotum, if present, formed by larger, symmetrically situated spots ...  
 ..... 34.



Figs 1026-1028. Apical half of aedeagus in dorsal and lateral view (1026, 1027 after LOPATIN 1977; 1028 after MEDVEDEV 1982): 1026, 1027 – *Cryptocephalus (Asionus) arnoldii*; 1028 – *C. (A.) stschukini*.

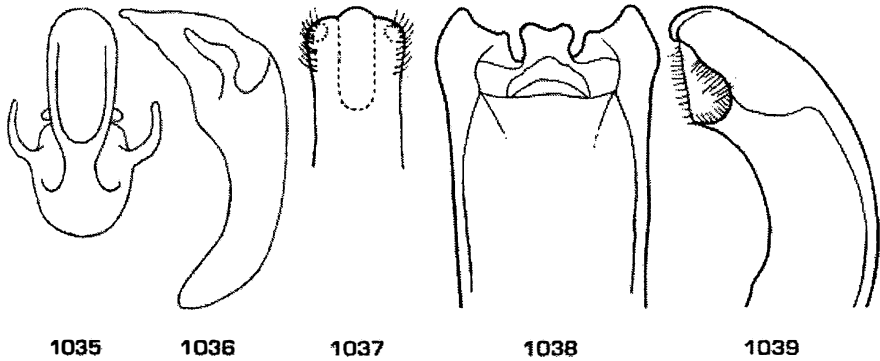
34. Pronotum short and broad, 1.6–1.8 × broader than long ..... 35.  
 –. Pronotum longer, somewhat narrowed anteriorly ..... 36.



Figs 1029-1034. Aedeagus in dorsal and lateral view (1029, 1030 after TOMOV 1976; 1031, 1032 after WARCHAŁOWSKI 1991; 1033, 1034 after LOPATIN 1977): 1029, 1030 – *Cryptocephalus (Asionus) pseudoreiteri*; 1031, 1032 – *C. (A.) limoniastris*; 1033, 1034 – *C. (A.) karakalensis*.

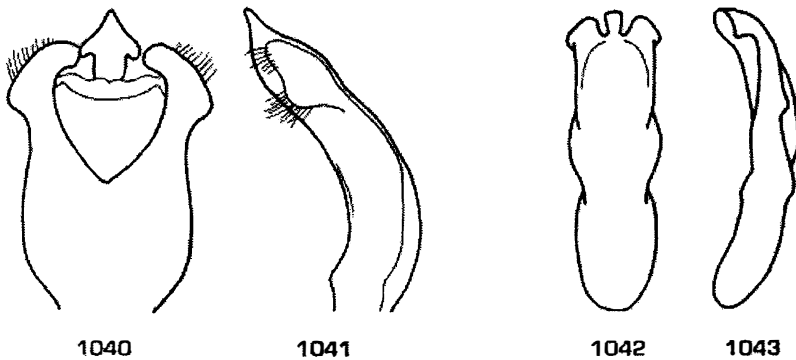
35. Pronotum broadly rounded. Punctuation of elytra semiregular. Upper side red brick, on pronotum two roundish spots, sometimes reduced or absent, on each elytron three spots (2, 1), postmedian spot largest, transverse. Suture without marginal blackening. Aedeagus as in figs **1033**, **1034**. General view as in plate XXVII, **phot. 239**. Length 5.0–6.0 mm. Distributed in Turkmenistan (Kopet-Dag mountains), Uzbekistan and Tadzhikistan ..... ***karakalensis*** MEDVEDEV, 1955.
- . Pronotum laterally feebly rounded. Punctuation of elytra entirely random. In male anal sternite with very deep impression, laterally with large, apically incised tooth. Pronotum red with two large black spots, often partly or entirely fused, elytra black, apical border, epipleura and small lateral margins red brick. Head black with two large semitriangular, pale yellowish spots on frons. General view as in plate XXVII, **phot. 240**. Aedeagus as in figs **1035**, **1036**. Length 4.6–5.5 mm. Distributed in Altai and Saján mountains ..... ***mniszechi*** TAPPES, 1869.
36. Upper side black, pronotum with short yellow stripe on anterior margin, on each side two spots at lateral margin and two spots before scutellum, yellow. Elytron black with five (humeral, basal, iuxtascutellar, central and apical) yellow spots. General view as in plate XXVII, **phot. 241**. Aedeagus as in fig. **1037**. In male anal sternite very shallowly impressed, with a small obtuse tooth or protruding tubercle at middle of basal margin. Length 4.5–5.5 mm (= *micropyga* WEISE, 1898). Distributed from Saján mountains and Mongolia to Transbaicalia, Amur- and Ussuri basins ..... ***hamatus*** SUFFRIAN, 1854.
- . Body differently coloured ..... 37.
37. In female pygidium with longitudinal furrow-like impression at base ..... 38.
- . In female pygidium without furrow at base ..... 39.

38. In male anal sternite with two small teeth at base. Upper side dark orange or red brick. On pronotum two transverse black spots, each elytron with two small (basal and preapical) black spots. Aedeagus as in figs **1038**, **1039**. Length about 5.0 mm. Distributed in SE Kazakhstan ..... **lukjanovitschi** LOPATIN, 1971.
- . In male anal sternite with two large, obtuse teeth at base. Upper side orange, on pronotum two large spots, on elytra three rather small spots (2, 1). Here paler variations of *stackelbergi* (thesis 18).



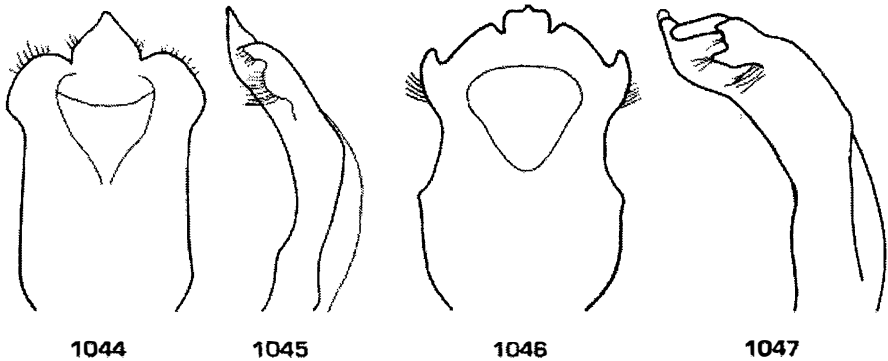
Figs 1035-1039. Aedeagus or its apical part in dorsal and lateral view (1035, 1036 after LOPATIN and DOVGALLO 2002; 1037 after MEDVEDEV 1982; 1038, 1039 after LOPATIN 1977): 1035, 1036 – *Cryptocephalus (Asionus) mniszzechi*; 1037 – *C. (A.) hamatus*; 1038, 1039 – *C. (A.) lukjanovitschi*.

39. Teeth at base of anal sternite in male small and sharp ..... **40**.
- . Teeth at base of anal sternite in male large, flattened ..... **42**.



Figs 1040-1043. Aedeagus in dorsal and lateral view (1040, 1041 after LOPATIN 1977; 1042, 1043 after WARCHAŁOWSKI 1991): 1040, 1041 – *Cryptocephalus (Asionus) pavlovskii*; 1042, 1043 – *C. (A.) reitteri*.

40. Elytra orange with two broad black bands, fused with sutural stripe. Frons without pale spots at eyes. On pronotum two large black roundish spots in anterior half, a thin shortened median line and two small spots at base. This pattern often expanded, covering most part of pronotum, which is black with anterior and lateral margins and shortened median stripe (usually forked behind) orange only. Aedeagus as in figs **1040**, **1041**. General view as in plate XXVII, **phot. 242**. Length 4.2–5.0 mm (= *imitator* OGLOBLIN et MEDVEDEV, 1956). Distributed in Kazakhstan and Usbekistan ..... **pavlovskii** LOPATIN, 1956.
- . Elytra yellow ochre with black spots ..... **41**.
41. On each elytron four large black spots (2, 2), inner spots usually fused with sutural stripe. Pronotum black, anterior and lateral margins and median stripe fused with two small prescutellar spots yellow. Length 4.0–5.0 mm. Described from Kazakhstan (Karatau mountains) ..... **karatavicus** LOPATIN, 1971.
- . On each elytron three (2, 1 small roundish black spots. On pronotum four black spots, inner large, outer small. General view as in plate XXVII, **phot. 243**. Aedeagus as in figs **1042**, **1043**. Length 4.5–6.0 mm. Variations: on elytron two (1, 1) black spots (ab. *flumensis* PIC, 1908), on elytron three (2, 1) black spots (typical form), on elytron three (1, 2) black spots (ab. *croaticus* CSIKI, 1953), on elytron four (2, 2) black spots (ab. *subocetopunctatus* KASZAB, 1962). Distributed in Croatia, Slovenia, Bosnia, Serbia and Hungary ..... **reitteri** WEISE, 1882.



Figs 1044-1047. Apical half of aedeagus in dorsal and lateral view (after LOPATIN 1977): 1044, 1045 – *Cryptcephalus (Asionus) bidentatus*; 1046, 1047 – *C. (A.) heydeni*.

42. Aedeagus (figs **1044**, **1045**) with triangular lamella on apex, anterior angles rounded. Upper side orange, on pronotum two large black spots and two feeble broadenings of black basal stripe. Elytra with four (2, 2) black spots and narrowly blackened suture. Length 4.0–5.0 mm. Variations: inner preapical spot absent (unnamed), dark colour expanded, elytra black with apical area and narrow marginal stripes yellow (melanotic form, unnamed). Distributed in E Kazakhstan and Tadzhikistan ..... **bidentatus** MEDVEDEV, 1956.

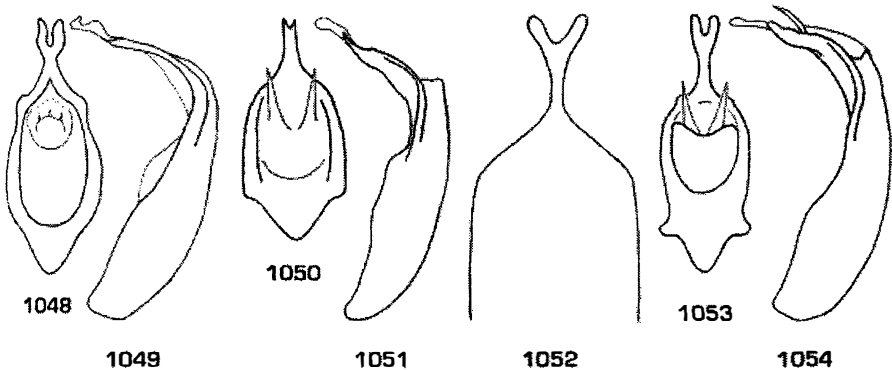
- Apical lamella of aedeagus (figs **1046**, **1047**) not triangular, lamella on apex, anterior angles with small, obtuse, protruding process. Colouring of body as in *bidentatus* (thesis 41) but without broadenings of black basal stripe. Length 4.3–5.2 mm. Variations: each transverse row of black spots on elytra forms a broad, transverse band, fused with sutural stripe (*biarcuatus* WEISE, 1886), elytra black with apical and lateral margins orange (darkest form, unnamed). Distributed in SE Kazakhstan and Tadzhikistan ..... *heydeni* WEISE, 1886.

Subgenus *Bertiellus* LOPATIN, 1977

Four species endemic to Afghanistan, externally similar to each other, differing mainly by aedeagus shape. Pronotum black, elytra brownish red with black pattern: a transverse stripe (or two spots only) in hind part, shortened sutural stripe and two oblique stripes running toward (but not reaching) humeral callus. Humeral callus usually also with black spot.

Key to species

1. Legs partly reddish, transverse stripe on hind part of elytra interrupted. Aedeagus as in figs **1048**, **1049**. Length 4.0–4.7 mm. Described from Afghanistan ..... *pushtunicus* LOPATIN, 1982.  
 Legs black ..... **2**.
2. Apical process of aedeagus (figs **1050**, **1051**) incised. Basal and sutural margins of elytra blackened, on each elytron one blackish spot before apex. Length 4.0–4.7 mm. Described from Afghanistan ..... *umarovi* LOPATIN, 1969.
- Apical process of aedeagus bifurcate. Transverse stripe on hind part of elytra and two oblique stripes running toward humerus distinct ..... **3**.



Figs 1048-1054. Aedeagus or its apical part in dorsal and lateral view (after LOPATIN and DOVGAILO 2002): 1048, 1049 – *Cryptocephalus (Bertiellus) pushtunicus*; 1050, 1051 – *C. (B.) umarovi*; 1052 – *C. (B.) bifurcatus*; 1053, 1054 – *C. (B.) lopatini*.

3. Aedeagus as in fig. **1052**. Known from Afghanistan (= *bifurcatus* MEDVEDEV, 1978, nec PIC, 1917). Length 4.1–4.2 mm ..... *bifurcatus* MEDVEDEV, 1978.

- . Aedeagus as in figs **1053**, **1054**. On average slightly smaller, length 3.6–4.1 mm. Described from Afghanistan ..... **lopardini** MEDVEDEV, 1978.

Subgenus **Burlinius** LOPATIN, 1965

Literature: WARCHAŁOWSKI 1999, SASSI 2004.

Unclear species *sultani* PIC, 1920 from Asia Minor and *piceovernalis* PIC, 1939 from Tunisia not included in the key.

Key to auxiliary groups

1. Pronotum punctate or wrinkled, puncturation sometimes very fine, but distinct on whole surface ..... **2**.
- . Pronotum smooth and impunctate. At most on marginal or basal part sparse and very fine punctures present ..... **3**.
2. Upper side entirely pale, usually yellow strow or pale ochra, at most basal margins of pronotum and elytra blackish, sometimes also with very narrow sutural margin brownish and pale, blurred, indefned darkkenings on elytra ..... auxiliary **group A** (p. 212).
- . Pronotum and elytra entirely dark (black, brown), or with pale and dark pattern ..... auxiliary **group B** (p. 217).
3. Upper side entirely pale, usually yellow strow or pale ochra, at most basal margins of pronotum and elytra blackish, sometimes also with very narrow sutural margin brownish and pale, blurred, indefned darkkenings on elytra ..... auxiliary **group C** (p. 223).
- . Pronotum and elytra entirely dark (black, brown), or with pale and dark pattern ..... auxiliary **group D** (p. 233).

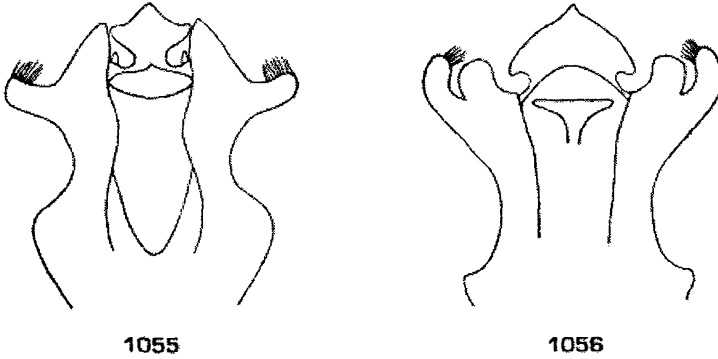
Auxiliary group **A**

Pronotum punctate or wrinkled, upper side pale.

Key to species

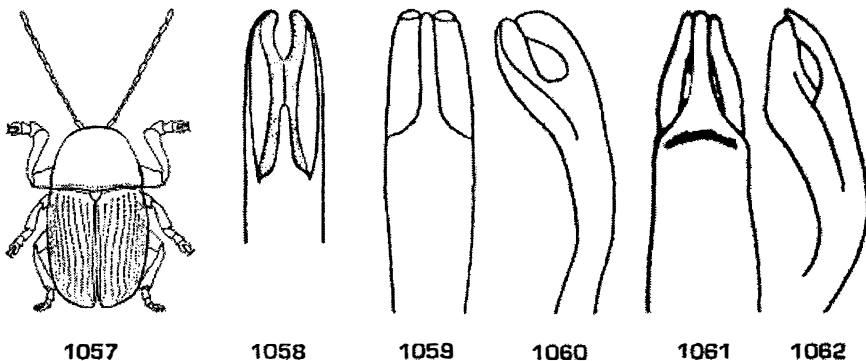
1. E Palaearctic species ..... **2**.
- . W Palaearctic species ..... **5**.
2. Upper side generally pale, underside blackish with pale prosternum and at least apical part of anal sternite ..... **3**.
- . Pronotum uniformly yellow, elytra usually with black longitudinal stripe on each. Black colour sometimes expanded on almost whole surface of elytra. Aedeagus as in fig. **1055**. Length 2.6–3.3 mm (= *kimotoi* NAKANE, 1963, *turpis* CHEN, 1942). Distributed in Mongolia, N China, E Siberia and Japan ..... **nigrofasciatus** JACOBY, 1885.
3. Pronotum and elytra differently coloured: pronotum yellowish brown, elytra largely dark reddish brown. Prosternum with two teeth on anterior margin. Aedeagus as in figs **1059**, **1060**. Length 2.5 mm (= *hakonensis* TAKIZAWA, 1982). Described from Japan (Honshu) ..... **pseudofulvus** MEDVEDEV, 1973.

- Pronotum and elytra similarly coloured, yellowish or pale ochraceous ..... 4.
- 4. On average smaller. Aedeagus not studied. Length 2.0–2.8 mm. Described from basin of Ussuri ..... ***gussakovskii*** LOPATIN, 1952.
- On average larger. Aedeagus as in figs 1061, 1062. Length 2.7–3.2 mm. Described from N Korea. Perhaps conspecific with *gussakovskii* (thesis 4) ..... ***sagamensis*** TOMOV, 1982.



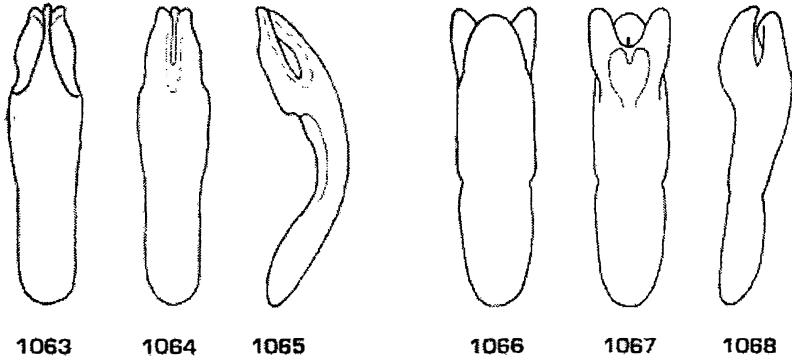
Figs 1055-1056. Apical part of aedeagus in dorsal view in *Cryptocephalus (Asionus) sarafschanensis* (after LOPATIN 1977): 1055 – subsp. *grumi*; 1056 – subsp. *iliensis*.

- 5. Species from Iran. Upper side dark reddish-yellow, basal margin of pronotum, scutellum and elytra very narrowly dark margined, on humeral callus sometimes blurred, indistinct, darker spot. Aedeagus as in figs 1063–1065. Described from S Iran ..... ***macilentus*** LOPATIN, 2000.
- Species from Europe, Mediterranean area, Madeira and Canary Islands ..... 6.



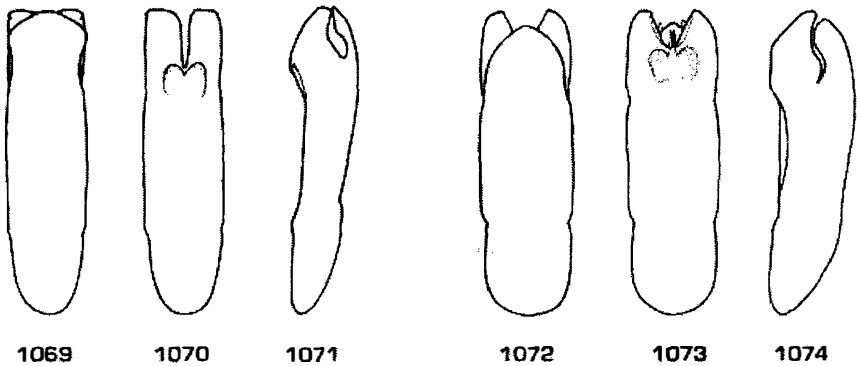
Figs 1057-1062. General view, aedeagus in dorsal and lateral view (1057 after SASSI and ZOIA 2002; 1058 after MEDVEDEV 1992; 1059, 1060 after KIMOTO and TAKIZAWA 1994; 1061, 1062 after TOMOV 1982): 1057 – *Cryptocephalus (Burlinius) plantaris*; 1058 – *C. (B.) kurentzovi*; 1059, 1060 – *C. (B.) pseudofulvus*; 1061, 1062 – *C. (B.) sagamensis*.

6. Species from Canary Islands and Madeira ..... 7.  
 -. Species from other areas ..... 9



Figs 1063-1068. Aedeagus in dorsal, ventral and lateral view (1063-1065 after LOPATIN and DOVGAILO 2002; 1066-1068 after WARCHALOWSKI 1999): 1063-1065 – *Cryptocephalus (Burlinius) macilentus*; 1066-1068 – *C. (B.) crenatus*.

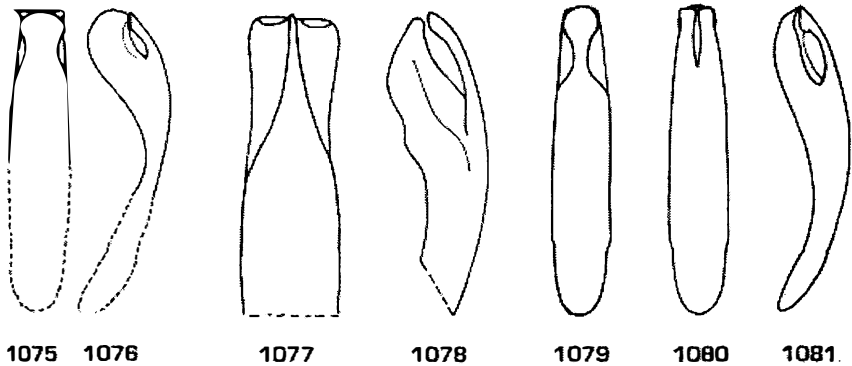
7. Punctuation of pronotum moderately strong, very dense, surface somewhat rough. In hind part of pronotum laterally punctures somewhat elongate. Aedeagus not studied. Length 3.2–3.5 mm. General view as in plate XXVIII, **phot. 244**. Variations: on pronotum central area darkened, pale brownish (ab. *madeirensis* PIC, 1938), on elytron large, blurred, pale brownish area (ab. *brunneobinotatus* PIC, 1938). Both variations belong probably not here, but to *puncticollis* (antithesis 8). Endemic to Madeira ..... ***crenatus*** WOLLASTON 1854.  
 -. Punctuation of pronotum strong, not very dense, even near hind angles punctures are free ..... 8.



Figs 1069-1074. Aedeagus in dorsal, ventral and lateral view (after WARCHALOWSKI 1999): 1069-1071 – *Cryptocephalus (Burlinius) trapezicollis*; 1072-1074 – *C. (B.) puncticollis*.



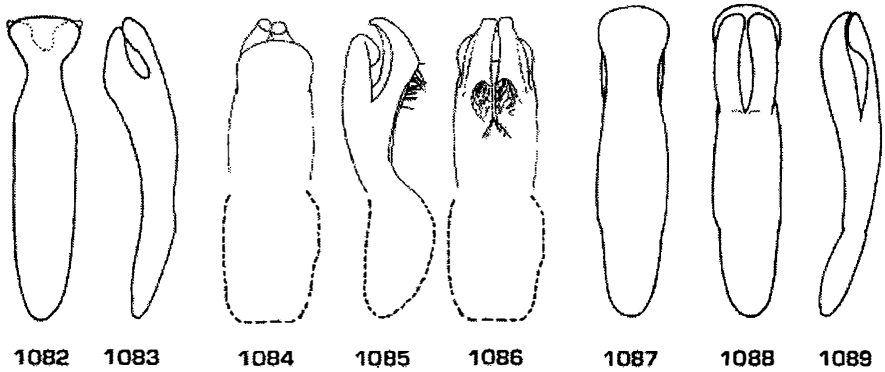
8. Pronotum approximately trapezium-shaped, its lateral margins almost straight. Upper side and underside uniformly reddish to rust-yellow, pronotum usually somewhat darker than elytra. Aedeagus as in figs **1069–1071**. Length 2.8–3.1 mm. Endemic to La Palma ..... ***trapezicollis*** LINDBERG, 1954.
- Pronotum not trapezium-shaped, its lateral margins rounded. Upper side uniformly ochraceous or rust-yellow, pronotum usually slightly darker than elytra. Underside dark brown, except prosternum, mesoepimeres and borders of abdomen being paler. Aedeagus as in figs **1072–1074**. Length 2.4–3.6 mm. Distributed in all Canary Islands and in Madeira ..... ***puncticollis*** WOLLASTON, 1864.
9. Pronotum with lateral impressions. Body entirely pale yellowish, basal margin of pronotum and elytra narrowly darkened, claws brown. In male fore and mid tarsi strongly broadened. Aedeagus as in figs **1075, 1076**. Endemic to Sardinia ....  
..... ***cognatus*** COSTA, 1888.
- Pronotum without lateral impressions ..... **10.**
10. Dorsal process of aedeagus (figs **1166–1168**) absent, both lateral process long, rather flat, rounded at apex. See *C. (B.) luridicollis*, auxiliary group C, thesis 16.
- Dorsal process of aedeagus present ..... **11.**
11. Dorsal process of aedeagus (figs **1077, 1078**) as long as lateral processes, evenly narrowed towards apex. Pronotum reddish-brown, finely but distinctly punctured. Elytra black with epipleura, lateral margin and apex yellow. Probably a form of *rufipes* (auxiliary group D, thesis 9) with more distinctly developed punctures on pronotum. Described from Turkey based on one specimen only ..... ***tshorumae*** TOMOV, 1984.
- Dorsal process of aedeagus differently shaped ..... **12.**



Figs 1075-1081. Aedeagus in dorsal, ventral and lateral view (1077, 1078 after TOMOV 1984, remaining after WARCHAŁOWSKI 1999): 1075, 1076 – *Cryptocephalus (Burlinius) cognatus*; 1077, 1078 – *C. (B.) tshorumae*; 1079-81 – *C. (B.) ochroleucus*.

12. Dorsal process of aedeagus narrowed before apex, club-shaped ..... **13.**
- Dorsal process of aedeagus not distinctly club-shaped, broad, its apex gently rounded ..... **14.**

13. Dorsal process of aedeagus rounded. Colouration of body always pale, in darkest specimens pale rust-reddish. Length 2.3–2.7 mm (= *fallax* SUFFRIAN, 1868). The sole variation ab. *laghouatensis* PIC, 1903 described from Algeria belongs certainly not here. Distributed mainly in N, W and Central Europe, eastward supposedly to basin of Dnieper ..... ***ochroleucus*** FAIRMAIRE, 1859.
- . Dorsal process of aedeagus broader, fan-shaped (fig. 1082, 1083). On humeral callus pale brownish spot, sometimes pale brownish longitudinal stripe beginning at humeral callus. Length 2.6–3.0 mm. Described from Oran as *C. ochroleucus* subsp. *orientalis* RAPILLY, 1980, nec HOPE, 1831, nec WEISE, 1882, but almost surely a distinct species ..... ***rapillyi*** WARCHAŁOWSKI, 2010.



Figs 1082-1089. Aedeagus in dorsal, ventral and lateral view (1082, 1083 after RAPILLY 1980; 1084-1086 after SASSI and ZOLA 2002; 1087-1089 after WARCHAŁOWSKI 1999): 1082, 1083 – *Cryptocephalus (Burlinius) rapillyi*; 1084-1086 – *C. (B.) plantaris*; 1087-1089 – *C. (B.) heinigi*.

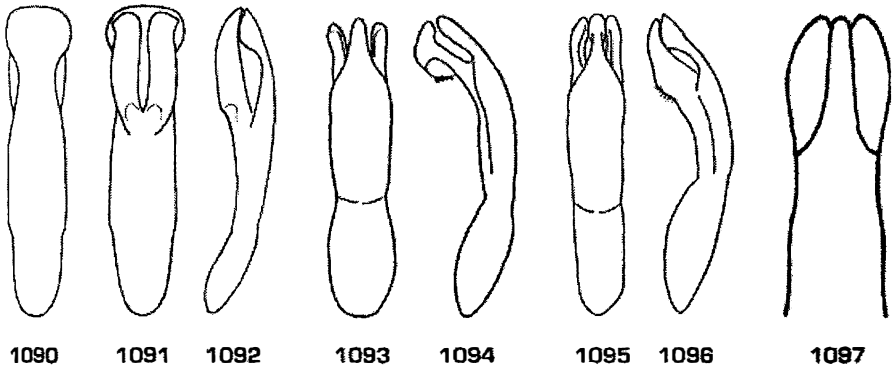
14. Dorsal process of aedeagus (figs 1084–1086) short, not narrowed before broad apical part. Legs robust, body stout, its general outline as in fig. 1057. Length 2.6–2.9 mm. Distributed in Sicily and Malta ..... ***plantaris*** SUFFRIAN, 1868.
- . Dorsal process of aedeagus longer, slightly narrowed before broad apical part ... 15.
15. Species from Near East. Puncturation of pronotum very fine to fine. In male fore and mid tarsi moderately strongly broadened. Aedeagus as in figs 1087–1089. Length 2.3–2.7 mm. Described from E Syria (basin of Euphrates) ..... ***heinigi*** WARCHAŁOWSKI, 1999.
- . Species from N Africa. Puncturation of pronotum fine to moderately strong. Aedeagus as in figs 1090–1092. Length about 2.4 mm. Distributed in Morocco and Algeria ... ***borowieci*** WARCHAŁOWSKI, 1999.

Auxiliary group B

Pronotum punctate or wrinkled, upper side partly or entirely dark.

Key to species

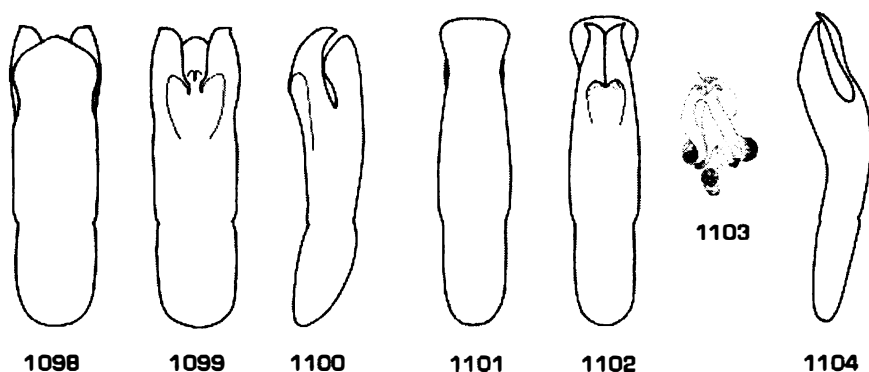
- 1. E Palaearctic species ..... 2.
- W Palaearctic species ..... 7.
- 2. Upper side with metallic reflex or shine ..... 3.
- Upper side without metallic shine or reflex ..... 4.
- 3. Upper side black with blue metallic shine. Hind femora and sometimes also hind tibiae (partly) partly blackish. Aedeagus as in figs **1093**, **1094**. Length 2.3–3.4 mm (= *discretus* BALY, 1873, *rectipennis* JACOBY, 1890). Distributed in Mongolia, N China, E Siberia, Korea and Japan ..... **confusus** SUFFRIAN, 1854.
- Upper side shining, black-bluish with cupreous reflex. Legs entirely pale. Aedeagus as in figs **1095**, **1096**. Described from Danjo Islands, W of Kyushu ..... **ejimai** TAKIZAWA, 1990.



Figs 1090-1097. Aedeagus in dorsal, ventral and lateral view (1090-1092, 1083 after WARCHAŁOWSKI 1999; 1093-1096 after KIMOTO and TAKIZAWA 1994; 1097 after MEDVEDEV 1992): 1090-1092 – *Cryptocephalus (Burlinius) borowieci*; 1093, 1094 – *C. (B.) confusus*; 1095, 1096 – *C. (B.) ejimai*; 1097 – *C. (B.) nigrofasciatus*.

- 4. Elytra entirely or almost entirely black ..... 5.
- Elytra yellow, each with long and broad black discal stripe reaching to 4/5 of elytral length. Pronotum dark yellow or yellowish orange with usual narrow basal black stripe. Colouration of body very similar as in *fausti* (thesis 26). Aedeagus as in fig. **1097**, its dorsal process long and narrow, with parallel sides. Length 2.6–3.3 mm (= *turpis* CHEN, 1942, *kimotoi* NAKANE, 1963). Variation: black colour on elytra expanded, almost whole surface black except dark yellow lateral margins, scutellum and a shortened scutellar stripe (unnamed). Distributed in Mongolia, almost whole China including Tibet and Yunnan, Japan and E Siberia ..... **nigrofasciatus** JACOBY, 1885.

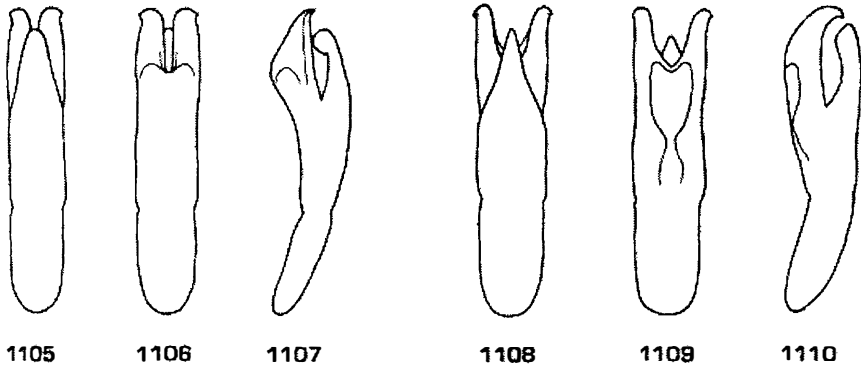
5. Upper side black, epipleura and scutellum grey-brown, legs entirely yellow. Aedeagus as in fig. 1058. Length about 2.5 mm. Distributed in Japan and Kuril Isl. .... *kurentzovi* MEDVEDEV, 1966.
- . Upper side differently coloured ..... 6.
6. Upper side black with lateral margins of pronotum, epipleura and apical part of elytra yellowish or pale brownish. Aedeagus not studied. Length 2.5 mm. Distributed in N China (Kansu) ..... *nebulo* WEISE, 1889.
- . Pronotum yellow with black hind margin, elytra entirely black. Dorsal process of aedeagus very long and narrow. Length 2.8–3.0 mm. Distributed in N China (Kansu) ..... *petulans* WEISE, 1889.
7. Species from Canary Islands. Upper side yellow, on pronotum two large black spots, sometimes expanded and covering the most part of surface except marginal stripes and anchor-shaped central pattern. On elytron an oblique stripe running from humeral callus to middle and sutural stripe black ..... 8.
- . Species from other areas ..... 11.
8. Upper side without black pattern ..... 9.
- . Black pattern on upper side present ..... 10.



Figs 1098-1104 (1003 after SCHÖLLER 2006, remaining after WARCHALOWSKI 1999): 1098-1102 and 1004 aedeagus in dorsal, ventral and lateral view, 1003: endophallus in *C. (B.) nubigena* 1098-1100 – *Cryptocephalus (Burlinius) nitidicollis*; 1101-1104 – *C. (B.) nubigena*.

9. Body length 1.9–2.4 mm. Upper side yellowish to pale ochra. Pronotum slightly darker, pale rust reddish with usual pale anchor-shaped pattern. In darker coloured specimens on elytra blurred, indistinct, yellowish-grey sutural and discal stripes. Aedeagus as in figs 1098–1100 (= *validicornis* LINDBERG, 1954). General view as in plate XXVIII, phot. 245. Distributed in whole Canary Archipelago ..... *nitidicollis* WOLLASTON, 1864.
- . Body length 3.3–3.6 mm. Coloured as *nitidicollis* (thesis 9). Large specimens of *nitidicollis*, known from Tenerife as *C. validicornis* LINDBERG, 1954 only, perhaps a local form.

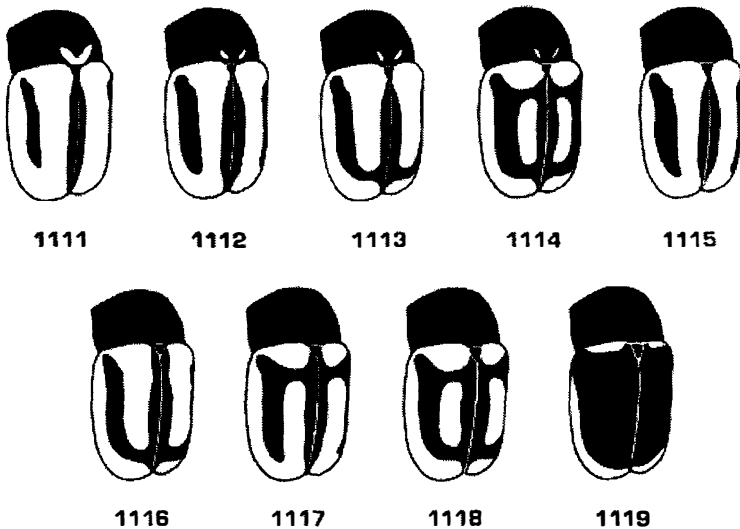
- 10. Black pattern of upper side distinct and rather sharp. Aedeagus as in figs **1101–1104**. Length 2.0–3.0 mm (= *palmensis* FRANZ, 1982). Known from Tenerife only ....  
..... **nubigena** FRANZ, 1982.
- Black pattern of upper side rather blurred. Length 2.4–2.5 mm. Known from La Palma as *palmensis* FRANZ, 1982, probably a local form of *nubigena* (thesis 10).
- 11. Pronotum densely covered by longitudinal wrinkles ..... **12**.
- Pronotum punctured ..... **13**.



Figs 1105-1110 (after WARCHAŁOWSKI 1999): 1105-1107 – *Cryptocephalus (Burlinius) exiguus*; 1108-1110 – *C. (B.) bilineatus*.

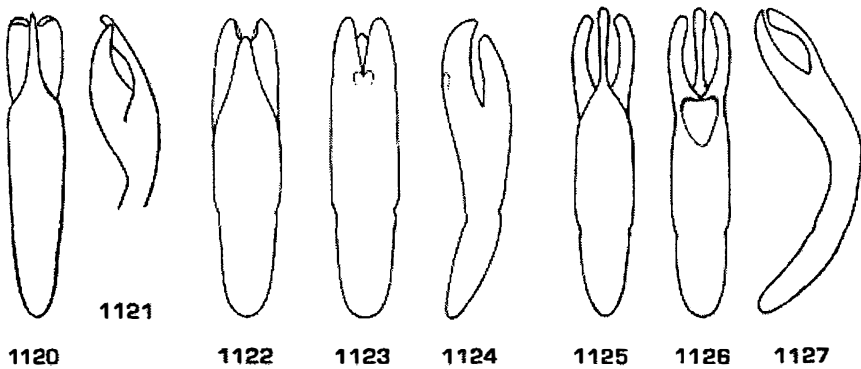
- 12. Pronotum and elytra black, wrinkles on pronotum shallow, in some E Palaearctic forms (see auxiliary group D, thesis 1) almost entirely or entirely disappearing. Body black, pattern on head, 4–5 basal antennomeres, fore legs almost entirely, mid and hind legs at least partly yellow. Aedeagus as in figs **1105–1107**. General view as in plate XXVIII, **phot. 246**. Length 1.9–2.3 mm (= *wasastjernii* GYLLENHAL, 1827). Transpalaearctic species, distributed from The British Isles to Ussuria and Japan. In East Palaearctic represented by subsp. *amiculus* BALY (auxiliary group D, thesis 1) ..... **exiguus** SCHNEIDER, 1792.
- Upper side bicolorous. In the darkest specimens at least lateral and anterior margins of elytra yellowish. General view as in plate XXVIII, **phot. 247**. On pronotum wrinkles deep and distinct. Aedeagus as in figs **1108–1110**. Length 1.9–2.3 mm. (= *armeniacus* FALDERMANN, 1837, *spitzyi* SUFFRIAN, 1848, *partitus* JACOBY, 1885). Nine variations were described, their names see caption to figs **1111–1119**. Transpalaearctic species, distributed from Spain and Great Britain to Japan ..... **bilineatus** (LINNAEUS, 1767).
- 13. Upper side entirely or almost entirely black, sometimes with feeble bluish metallic reflex ..... **14**.
- Upper side bicolorous ..... **20**.
- 14. Legs for the most part dark. Length of body about 2.5 mm. Species from North Africa. See *reichei* (*Cryptocephalus* s. str. auxiliary group H, thesis 16).
- Legs for the most part pale. Species from another area ..... **15**.

15. Pronotum rather strong and deeply punctured, body not broad and stout ..... 18.  
 - Pronotum finely punctured ..... 16.
16. Dorsal process of aedeagus slightly narrowed towards apex, on apex broadly transversely cut. Mouth parts pale. Pronotum black with anterior and lateral margins yellowish, rarely also with two oblique brownish spots in hind part. Elytra sometimes entirely black, usually with dark yellow lateral margins and discal stripe reaching to 2/3 length. Both the aedeagus shape and external characters as in dark variations of *pygmaeus* (antithesis 25). Described from India, reported also from Afghanistan ..... **notogrammus** SUFFRIAN, 1854.
- Dorsal process of aedeagus strongly narrowed or cone-shaped, not transversely cut ..... 17.
17. Pronotum sparsely punctured. Body black, genae, spot on clypeus and two little spots between eyes yellowish. Legs yellowish, knees slightly darkened. Aedeagus as in figs 1120, 1121. Length 2.6–2.8 mm. Described from Afghanistan ..... **kabakovi** MEDVEDEV, 1978.
- Pronotum finely and shallowly, but distinctly and densely punctured. Body very broad and stout. Body shining black, legs, basal 5–6 antennomeres and two spots on frons yellow. Aedeagus as in figs 1122–1124. Length 2.4–2.9 mm (= *ovulum* JACOBSON, 1894, *oomorphus* JACOBSON, 1895). Distributed in Caucasian countries, Transcaucasia and Afghanistan ..... **lederi** WEISE, 1889.
18. Length of body not exceeding 2.0 mm, elytra always without metallic reflex. Here entirely black forms of *elegantulus* (thesis 22), occurring mainly in Caucasian countries and in northern Turkey.
- Body longer, normally exceeding 2.5 mm ..... 19.



Figs 1111–1119 (after WARCHALOWSKI, 1991). *Cryptocephalus (Burlinius) bilineatus*, variations: 1111 – ab. *pseudoarmeniacus* BURLINI, 1955; 1112 – ab. *armeniacus* FALDERMANN, 1837; 1113 – ab. *ehmanni* CSIKI, 1953; 1114 – ab. *ujhelyi* CSIKI, 1953; 1115 – typical form; 1116 – ab. *gesztelensis* CSIKI, 1953; 1117 – ab. *bakonyensis* KASZAB, 1962; 1118 – ab. *bisbilineatus* PIC, 1904; 1119 – ab. *moestus* WEISE, 1882.

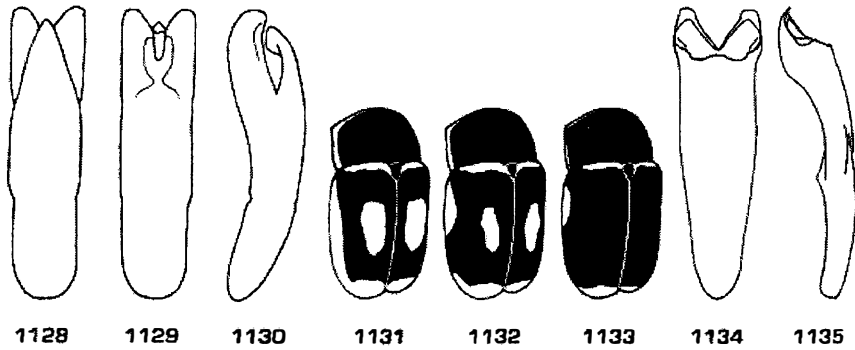
19. Dorsal process of aedeagus (figs **1125–1127**) long and narrow. Elytra usually with feeble, bluish metallic reflex. Length 2.4–2.9 mm. Variation: punctures of pronotum strong, oblong, surface matt, distinctly reticulated (ab. *reticulaticollis* ROUBAL, 1929). Distributed mostly in Middle- and North-Europe, from Great Britain and France to West Siberia ..... **punctiger** PAYKULL, 1799.
- Dorsal procers of aedeagus (figs **1134, 1135**) extremely short, practically absent. Head yellow with a narrow transverse stripe on vertex and median longitudinal line on frons brown or blackish, pronotum black with yellowish anterior and lateral margins, elytra black with yellowish epipleura. Length 2.6–3.3 mm. Described from W Turkey ..... **ayvazi** GÖK et SASSI, 2002.



Figs 1120-1127 (1120, 1121 after MEDVEDEV 1978, remaining after WARCHALOWSKI 1999): 1120, 1121 – *Cryptcephalus (Burlinius) kabakovi*; 1122-1124 – *C. (B.) lederi*; 1125-1127 – *C. (B.) punctiger*.

20. Upper side black with yellow pattern ..... **21.**
- Body differently coloured. Punctures of pronotum very fine and shallow ..... **23.**
21. Pronotum strongly punctured ..... **22.**
- Pronotum finely punctured. Here bicolorous form of *notogrammus* (thesis 16).
22. Upper side black with yellow pattern, general view as in plate XXVIII, **phot. 248.** Aedeagus as in fig. **1128–1130.** Length 1.8–2.3 mm (= *tessulatus* GERMAR, 1813, *jucundus* FALDERMANN, 1837). Variations and their names as in figs **1131–1133.** It exists also an aberration with elytra uniformly black (unnamed). Transpalearctic species, distributed from France to Korea ..... **elegantulus** GRAVENHORST, 1807.
- Upper side black with little yellowish spots at apex (or at apex and anterior margin) of elytron. Species from North Africa. Here variations of *reichei* (auxiliary group H, thesis 16).
23. Upper side rust-yellow, on pronotum two great, blurred pitchy black spots, and in posterior part of elytra a brown sutural stripe. Here the darkest forms of *nitidicollis* (thesis 9).
- Body differently coloured ..... **24.**

24. Pronotum entirely black or black with anterior and lateral margins yellow, elytra yellow with black pattern, rarely uniformly pale or pale with dark sutural stripe ..... 25.  
 - Pronotum uniformly pale or pale with blackish pattern ..... 26.

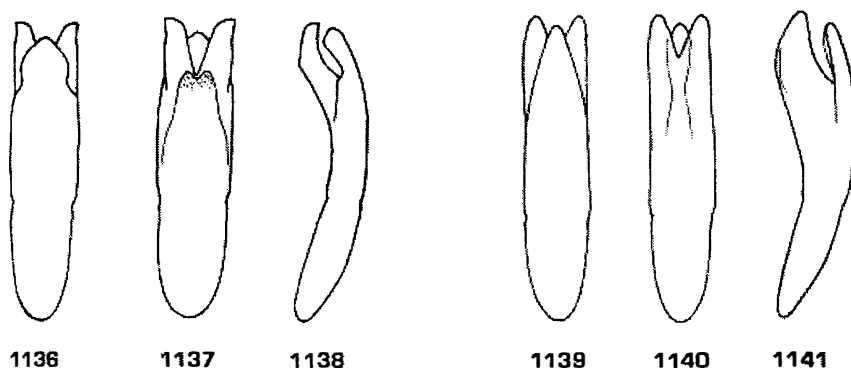


Figs 1128-1135 (1128-1130 after WARCHAŁOWSKI 1999; 1131-1133 after WARCHAŁOWSKI 1991; 1134, 1135 after GÓK and SASSI 2002): 1128-1133 – *Cryptocephalus (Burlinius) elegantulus*: 1128-1130 – aedeagus in dorsal, ventral and lateral view; 1131-1133 – variations: 1131 – typical form; 1132 – unnamed; 1133 – ab. *deubeli* KASZAB, 1962; 1134, 1135 – *C. (B.) ayvazi*.

25. Body very small (2.0 mm not exceeding). General view as in plate XXVIII, **phot. 249**. Pronotum entirely black or with shortened yellow lateral stripe near posterior angles. Dark elytral pattern feebly developed, usually present only a narrow, brownish sutural stripe and a small humeral spot. Aedeagus as in figs **1067–1069**. Length 1.7–2.0 mm (= *capucinus* SUFFRIAN, 1853, nec GMELIN, 1790). Variations: a darker form; pronotum entirely black, on elytron a short blackish stripe running backward from humeral callus (typical form), pronotum entirely black, elytron with very narrow sutural stripe and a little brown humeral spot (unnamed), pronotum with narrow yellowish stripe along lateral margins (ab. *cobosi* BURLINI, 1955). Distributed in south-western part of Europe ..... ***moroderi* PIC, 1914.**
- Body longer (above 2.0 mm). On pronotum at least anterior and lateral margins always yellow. Aedeagus as in figs **1139–1141**. Occurs as two subspecies:
- A) *pygmaeus* s. str. (= *atlasicus* BURLINI, 1970, *atlanticus* BURLINI, 1970) distributed in western part of Europe and in north-western Africa, on average smaller, 2.0–2.8 mm, black pattern rather feebly developed, punctures of pronotum very fine and sparse, General view as in plate XXVIII, **phot. 250**.
- B) *pygmaeus vittula* SUFFRIAN, 1848 (= *amaenus* DRAPEZ, 1819, *orientalis* WEISE, 1882) distributed mainly in central and eastern part of Europa, in Asia B) Minor and in Caucasian countries, on average larger (2.5–3.1 mm), black elytral pattern almost always very well developed, punctures of pronotum not dense, but distinct), General view as in plate XXVIII, **phot. 251**. About 15 variations were described, the most important aberrations and their names see caption to figs **1142–1145** ..... ***pygmaeus* FABRICIUS, 1792.**



26. Pronotum pale rust-yellowish. General view as in plate XXVIII, **phot. 252**. On each elytron a broad longitudinal black stripe. Aedeagus as in figs **1146–1148**. Length 2.4–2.6 mm (= *ozbeki* ASLAN et WARCHAŁOWSKI, 1998). Distributed in Caucasian countries and in NE Turkey ..... *fausti* WEISE, 1882.
- Pronotum with charakteristic pattern as in plate XXIX, **phot. 253**. Aedeagus as in figs **1149–1151**. Length 2.0–2.5 mm. Endemic to Balears ..... *tramuntanae* PETITPIERRE, 1993.



Figs 1136-1141. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1136-1138 – *Cryptcephalus (Burlinius) moroderi*; 1139-1141 – *C. (B.) pygmaeus*.

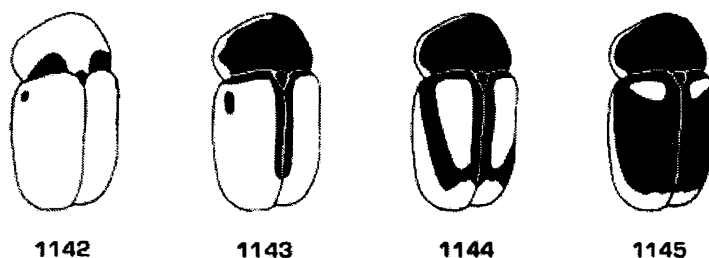
### Auxiliary group C

Pronotum smooth, upper side entirely or almost entirely pale.

#### Key to species

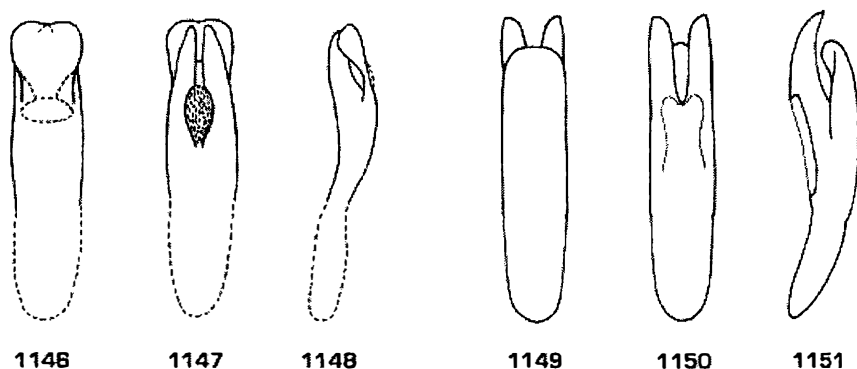
1. Species from Canary Islands ..... **2.**
- Species from other areas ..... **3.**
2. Smaller, body length always under 3.0 mm. Upper side pale testaceous to ochraceous. Pronotum usually slightly darker, rust-yellow with paler margins and usual anchor-like pattern. Darkest spaces on pronotum sometimes blackish suffused or forming undefined spots. Elytra usually pale, more rarely with darkenings along suture and blurred longitudinal stripe parallel to lateral sides. In male first tarsomere of fore legs distinctly but not strong broadened. Aedeagus as in figs **1098–1100**. Length 1.9–2.4 mm. Distributed in whole Canary Archipelago. See *nitidicollis* WOLLASTON, 1964, auxiliary group B, thesis 9.
- Larger, body length always exceeds 3.0 mm. Body colouration as in *nitidicollis* (thesis 2). Length 3.3–3.6 mm (male) to 3.8–4.5 mm (female). Distributed in Tenerife. Here (?form) *validicornis* LINDBERG, 1954, see *nitidicollis* (thesis 2).
3. Species from Central Asia, Iran and Afghanistan ..... **4.**
- Species from other areas ..... **11.**

4. Dorsal process of aedeagus absent ..... 5.  
 - Dorsal process of aedeagus present ..... 6.



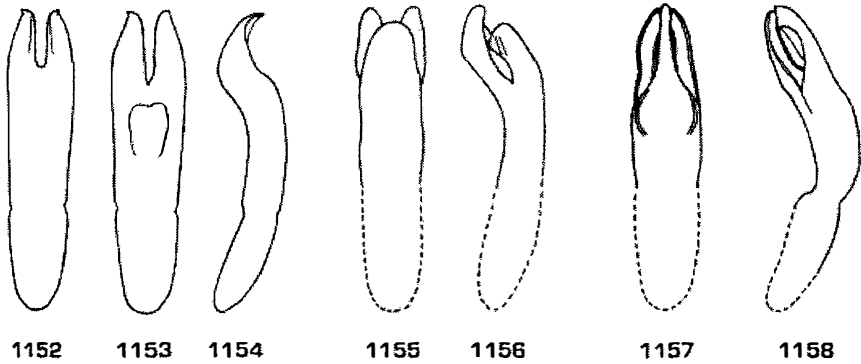
Figs 1142-1145. *Cryptocephalus (Burlinius) pygmaeus*, variations (after WARCHALOWSKI 1991): 1142 - ab. *atlanticus* BURLINI, 1970; 1143 - typical form; 1144 - ab. *amaenus* DRAPIEZ, 1819; 1145 - ab. *lugubris* DEMAISON, 1904.

5. On average larger. Upper side yellowish, pronotum usually slightly darker, ochraceous with pale anchor-like pattern. Metasternum and abdomen pitchy black, apical antennomeres only slightly darkened. On elytra often blurred grey-brownish spots at humeral callus and in hind part, sometimes fused and forming blurred stripe running backward from humeral callus. Aedeagus as in figs 1152-1154. Length 2.4-3.2 mm. Variation *ahngeri* JACOBSON, 1901 belongs not here, see *connexus* (auxiliary group D, antithesis 33). Forms two subspecies: colouration of body as above (nominotypical subspecies distributed in SE Kazachstan and E Usbekistan), colouration darker, stripes on elytra always present, pitchy (subsp. *narzykulovi* LOPATIN, 1958, = *puzanovi* LOPATIN, 1958, distributed in Tadzhikistan) ..... *tschimganensis* WEISE, 1894.  
 - On average smaller. Upper side uniformly pale. See *xanthus* (*Cryptocephalus* s. str., auxiliary group G, thesis 12).



Figs 1146-1151. Aedeagus in dorsal, ventral and lateral view (after WARCHALOWSKI 1999): 1146-1148 - *Cryptocephalus (Burlinius) fausti*; 1149-1151 - *C. (B.) tramuntanae*.

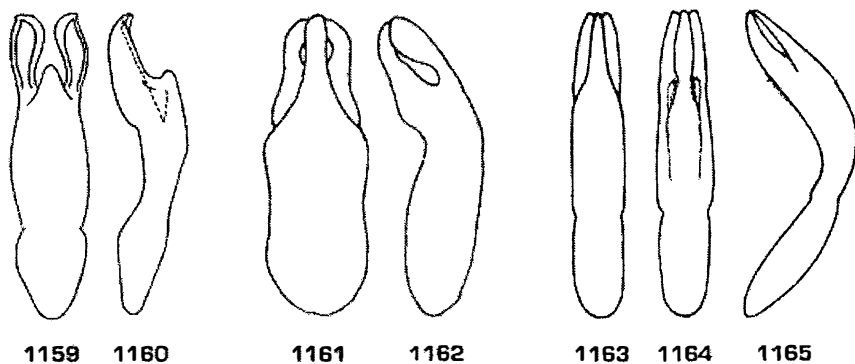
6. Dorsal process of aedeagus (figs **1155**, **1156**) broad, its apex rounded. Smaller, length of body 2.8–3.0 mm. General outline relatively slender. Described from Kirgisia (Terskij Alatau) ..... ***shabalinae*** LOPATIN, 1968.  
 -. Dorsal process of aedeagus very narrow, parallel ..... **7.**



Figs 1152-1158. Aedeagus in dorsal, ventral and lateral view (1152-1154 after WARCHALOWSKI 1999, remaining after LOPATIN 1977): 1152-1154 – *Cryptocephalus (Burlinius) tschimganensis*; 1155, 1156 – *C. (B.) shabalinae*; 1157, 1158 – *C. (B.) dilutellus*.

7. Larger, body length over 3.5 mm. Here pale forms of *invisus* (auxiliary group D thesis 36).  
 -. Smaller body length 2.6–3.4 mm ..... **8.**  
 8. Elytra almost 3 × longer than pronotum. Upperside pale ochraceous with lightnings on head, scutellum and pronotum. On pronotum lighter colour forms usual anchor-like pattern, sometimes reduced to longitudinal stripe along middle. Antennomeres 6–11 darkened. Underside pale, abdomen often brown. Abdominal tergites blackish or black with yellow lateral margins. Here three species similar to each other, distinguishable by shape of aedeagus ..... **9.**  
 -. Elytra shorter, at most 2.5 × longer than pronotum. Aedeagus as in figs **1301–1303**. Here pale variation of *polymorphus* (auxiliary group D thesis 35) without black pots on elytra.  
 9. Dorsal process of aedeagus (figs **1157**, **1158**) thin and long, as long as lateral processes or slightly longer. Upper side yellowish with paler, yellowish-whitish blurred areas on head and pronotum. Length 2.6–3.5 mm, mostly about 3.1 mm. Variation: pronotum uniformly coloured, without lightnings (ab. *fedtschenkoii* JACOBSON, 1901). Distributed in Transkaspia (Kazakhstan, Tadzhikistan, Kirgisia) ..... ***dilutellus*** JACOBSON, 1901.  
 -. Dorsal process of aedeagus very short, about 3 × shorter than lateral processes ... **10.**  
 10. Dorsal process of aedeagus (figs **1159**, **1160**) rather broad, cone-shaped, lateral process relatively large. Length 2.5 mm. Described from E Iran ..... ***scarificollis*** LOPATIN, 1984.

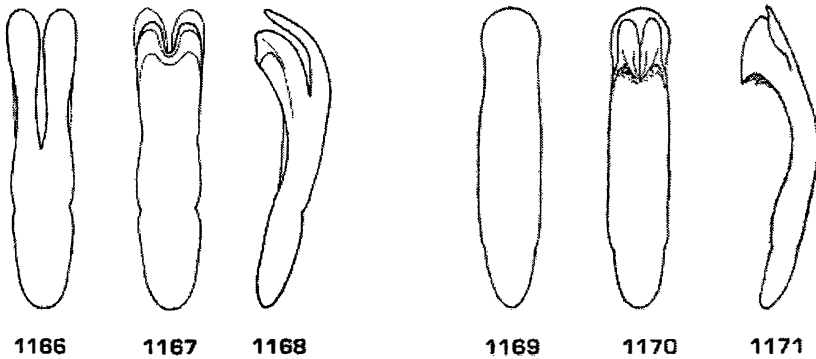
- Dorsal process of aedeagus suddenly narrowed, its apical half thin, sharpened. Length 2.5–3.5 mm. See *dilutellus* ab. *fedtschenkoi* (thesis 9).
- 11. Species from E Palaearctic area ..... 12.
- Species from other areas ..... 14.
- 12. Length of body under 3.0 mm ..... 13.
- Length of body over 3.2 mm. Upper side pale yellowish, underside except prosternum black. Elytra yellowish, narrowly margined with black. Epipleura partly black, pygidium pale. Aedeagus not studied. Length 3.2–4.3 mm. Described from China (not Palaearctic?) ..... *nigrolimbatus* JACOBY, 1890 incerti subgeneris (*Burlinius*?).
- 13. Body pale, mesosternum, metasternum and abdominal sternites 1–4 darkened. Anterior margin of prosternum forms a tooth, visible in lateral view without ungluing the specimen. Aedeagus not studied. Length 2.0–2.6 mm. Distributed in basin of Ussuri ..... *gussakovskii* LOPATIN, 1952.
- Body pale, on each elytron longitudinal black stripe, running parallel to lateral margin, gently narrowed in its midlength. Aedeagus as in figs 1161, 1162. Length about 2.4 mm. Described from N China (Shansi) ..... *vividus* LOPATIN, 1997.



Figs 1159–1165. Aedeagus in dorsal, ventral and lateral view (1159, 1160 after LOPATIN 1984; 1161, 1162 after LOPATIN 1997; 1163–1165 after WARCHAŁOWSKI 1999): 1159, 1160 – *Cryptocephalus (Burlinius) scarificollis*; 1161, 1162 – *C. (B.) vividus*; 1163–1165 – *C. (B.) populi*.

- 14. Fore tibiae in female weakly, in male strongly bent. Upper side pale, on head rusty coloured darkenings over antennal sockets and along middle of frons. Vertex blackish. Pronotum with almost always distinct paler anchor-like pattern. On elytra usually darker blurred longitudinal strip beginning at humeral callus. Basal 4–5 antennomeres rust yellow, remaining brown to pitchy black. Scutellum with dark margins. Underside black, abdomen sometimes with paler margin of anal sternite. General view as in plate XXIX, phot. 254. Aedeagus as in figs 1163–1165. Mesoepimeres yellow or at least with reddish spot. Length 2.5–3.1 mm (= *brachialis* MULSANT, 1859). Variations: colouration of body as above (typical form), both longitudinal stripes of elytra fused in apical part (ab. *henningsi* BURLINI,

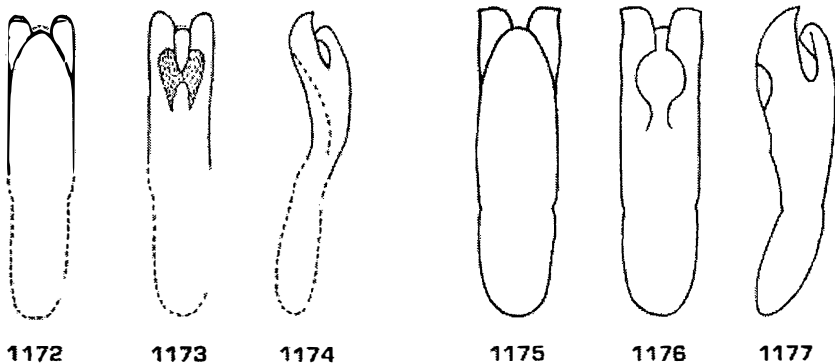
- 1955), humeral callus and sutural stripe blackish (unnamed dark variation). Distributed in Europe south of 56° from Pyrenees and W France to Crimea, reported also from Caucasian countries and E Kazakhstan ..... **populi** SUFFRIAN, 1848.
- Fore tibiae not bent ..... 15.
  - 15. Pronotum with lateral impressions. Here forms of *cognatus* (auxiliary group A, thesis 9) with indistinct puncturation of pronotum.
  - Pronotum without impressions ..... 16.



Figs 1166-1171. Aedeagus in dorsal, ventral and lateral view (1166-1168 after BURLINI 1955 modified, 1169-1171 orig.): 1166-1168 – *Cryptocephalus (Burlinius) luridicollis*; 1169-1171 – *C. (B.) sindonicus*.

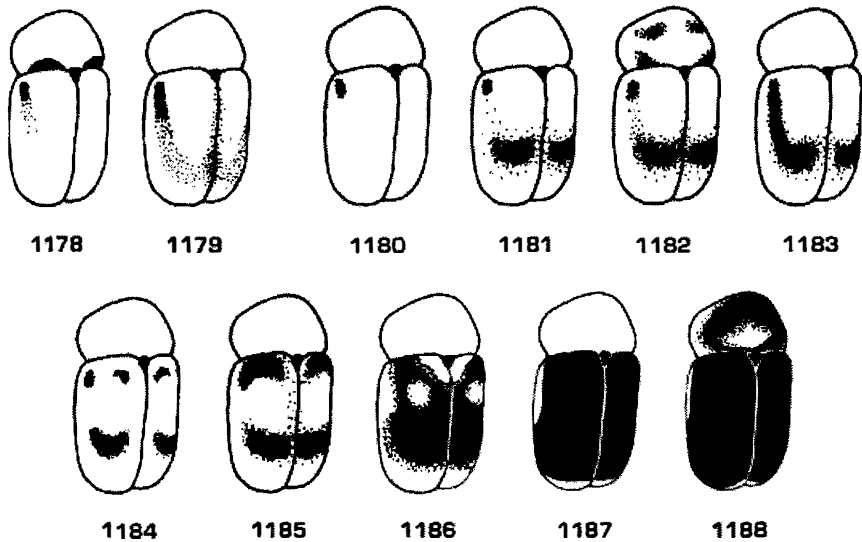
- 16. Dorsal process of aedeagus (figs **1166–1168**) absent, lateral process long, flat, with rounded apex. Body pale ochraceous, pronotum rust-brown with pale margins and pale anchor-like pattern. Length 2.1–2.7 mm (= *maculicollis* REY, 1860 nec KLUG, 1835, *reyi* TAPPES, 1871, *cisti* PIC, 1905). Variation: dark pattern on pronotum reduced to two small, blurred spots (ab. *codinai* BURLINI, 1958). Distributed in Morocco, Iberian Peninsula and S France ..... **luridicollis** SUFFRIAN, 1868.
- Dorsal process of aedeagus present ..... 17.
- 17. Dorsal process of aedeagus broad, parallel-sided or somewhat constricted before apex, its apex rounded ..... 18.
- Dorsal process of aedeagus narrow or at least strongly narrowed towards apex ..... 27.
- 18. Dorsal process of aedeagus very short and broad, legs robust. Body entirely pale coloured. General outline of body as in fig. **1057**. Distributed in Sicily and Malta. See *plantaris*, auxiliary group A, thesis 14.
- Dorsal process of aedeagus not very short ..... 19.
- 19. Abdomen pitchy or black, at most with pale apex of anal sternite ..... 20.
- Abdomen pale ..... 23.
- 20. Epipleuron without punctures ..... 21.
- Epipleuron with a row of large punctures ..... **planifrons** WEISE, 1882.
- 21. Species from Europe and NW Africa. Body more stout. Upper side generally pale. Elytra yellowish strow, pronotum, scutellum, legs and antennomeres 1–4 pale yellow amber or ochraceous ..... 22.

- . Species from Tian-Shan. Body more slender, length 2.8–3.0 mm, remaining characters also shape of aedeagus (figs **1155**, **1156**) as in *fulvus*. See *shabalinae* (thesis 6).
- 22. Dorsal process of aedeagus present. General view as in plate XXIX, **phot. 255**. Aedeagus (figs **1175**, **1176**) pitchy or black, area setulifera on its ventral side almost regularly circular. Length 2.0–2.8 mm (= *minutus* FABRICIUS, 1792, *ochraceus* STEPHENS, 1829, *signaticollis* SUFFRIAN, 1848). Variations: on humeral callus situated a blurred, brownish spot (typical form), upper side uniformly pale (ab. *fulvicollis* SUFFRIAN, 1848), on each elytron longitudinal blurred, brownish stripe from humeral callus to apical 3/4, darker sutural stripe also present (ab. *vittatus* GOZIS, 1907), at basal margin of pronotum two transverse, blackish stripes (ab. *weiseanus* BREIT, 1918), dark form, pronotum as in ab. *weiseanus*, elytra as in ab. *vittatus* (= ab. *signaticollis* SUFFRIAN, 1848), melanotic form, pronotum in great part, longitudinal stripes and sutural stripe on elytra blackish (ab. *succinctus* WEISE, 1882). *C. fulvus* forms two not sharply separated geographical forms. In M and N Europe predominates typical *fulvus*, larger (on average 2.45 mm) and darker, with almost entirely black anal sternite, in S Europe and in Mediterranean area the form *minutus* FABRICIUS, 1792, paler and smaller (on average 2.25 mm), with always pale apex of anal sternite. Distributed mainly in Europe and Mediterranean area, from N Morocco and Portugal to S Finland, basin of Wolga and Caucasian countries. Reports from Transcaspia uncertain, see also *shabalinae* (thesis 6) ..... **fulvus** (GOEZE, 1777).
- . Dorsal process of aedeagus (figs **1191–1193**) absent. Length about 2.5 mm. External characters as in *fulvus* (thesis 22). Described from Algeria ..... **saintpierrei** TAPPES, 1869.
- 23. Dorsal process of aedeagus triangularly narrowed, but its apex relatively broadly rounded ..... **24**
- . Dorsal process of aedeagus not triangularly narrowed ..... **25**



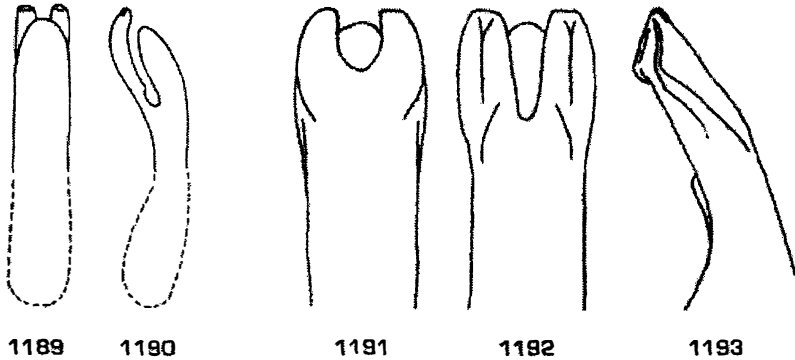
Figs 1172-1177. Aedeagus in dorsal, ventral and lateral view (1172-1174 after MEDVEDEV and SAMODERZHENKOV 1989; 1175-1177 after WARCHAŁOWSKI 1999): 1172-1174 – *Cryptocephalus (Burlinius) planifrons*, 1175-1177 – *C. (B.) fulvus*.

24. Smaller. Body except black abdominal tergites, entirely pale, abdominal sternites sometimes and 3–4 apical antennomeres always, darkened, brownish. Paler (yellowish strow to whitish) colour on head, scutellum and on pronotum in form of anchor-like pattern. Length 2.0–2.3 mm. Distributed in Israel and Lebanon ....  
 ..... *dahdah* MARSEUL, 1869.
- Larger. Somewhat darker coloured, scutellum blackish. Length 2.5–2.9 mm. Aedeagus as in figs 1197–1199. Possibly conspecific with *dahdah* MARSEUL, 1869 (thesis 24) and *bidorsalis* MARSEUL, 1875, also from Lebanon. Described from Near East (Syria, Jordan) ..... *brevisignaticollis* PIC, 1914.
25. Dorsal process of aedeagus (figs 1200–1202) slightly narrowed towards apex, at apex transversely, broadly cut. Body entirely pale except usual blackish basal margins of elytra and pronotum. In male first tarsomere of fore legs broadened and elongated, as long as two following together. Length 2.2 mm (= *lostianus* BURLINI, 1955). Endemic to Sardinia ..... *lostiai* BURLINI, 1951.
- Dorsal process of aedeagus (figs 1203–1205) broadly, semicircularly rounded. Body entirely pale except blackish basal margins of elytra and pronotum, blackish 3–5 apical antennomeres and black tergites of abdomen. Length 2.3–2.8 mm .... 26.
26. Species described from Sicily ..... *politus* SUFFRIAN, 1853.
- Species described from Algeria. Here also variation: body somewhat darker coloured, ochraceous, with shortened dark sutural stripe. Probably conspecific with *politus* (thesis 26) ..... *sindonicus* MARSEUL, 1875.



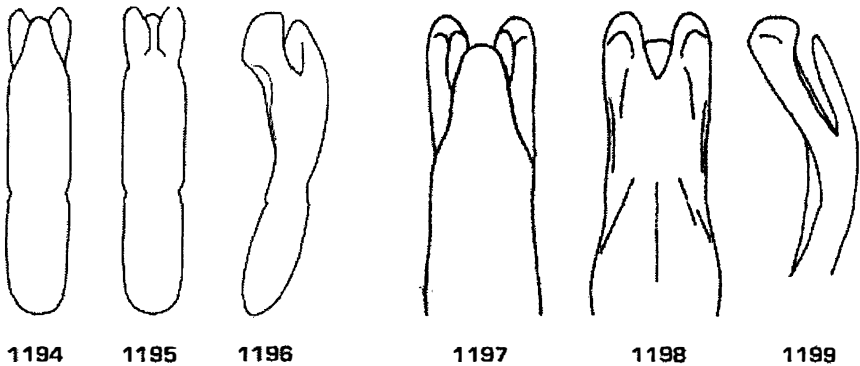
Figs 1178–1188. Variations (after WARCHALOWSKI, 1991). 1178, 1179 – *Cryptocephalus (Burlinius) fulvus*: 1178 – ab. *weiseanus* BREIT, 1918; 1179 – ab. *succinctus* WEISE. 1180–1188 – *C. (B.) pusillus*: 1180 – ab. *immaculatus* WESTHOFF, 1882; 1181 – typical form; 1182 – ab. *viduus* WEISE, 1889; 1183 – ab. *baudii* PIC, 1945; 1184 – ab. *multinogronotatus* PIC, 1926; 1185 – ab. *testouti* PIC, 1945; 1186 – ab. *ernesti* PIC, 1926; 1187 – ab. *marshami* WEISE, 1882; 1188 – ab. *planchezi* PIC, 1926.

27. Dorsal process of aedeagus as long as lateral process ..... 28.  
 -. Dorsal process distinctly or considerably shorter than lateral process ..... 30.



Figs 1189-1193. Aedeagus in dorsal, ventral and lateral view (1189, 1190 after SASSI in litt., 1191-1193 after SASSI 2004): 1189, 1190 – *Cryptocephalus (Burlinius) sultani*; 1191-1193 – *C. (B.) saintpierrei*.

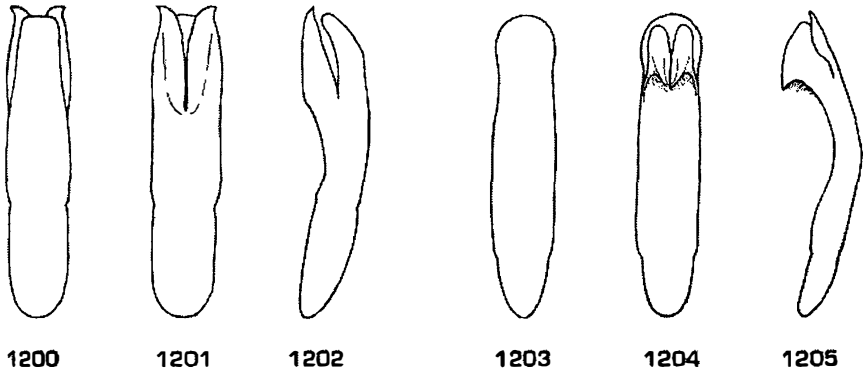
28. Dorsal process of aedeagus (figs 1206–1208) evenly narrowed, lateral process in lateral view rather strongly thickened. Body entirely pale, a few apical antennomeres and sometimes abdomen pale brownish. In male first tarsomere of fore legs distinctly longer and strongly broadened. Length 1.9–2.3 mm. Variations: colouration of body as above (typical form), body brownish, punctures of elytra darker brownish suffused (unnamed), body brown, on elytra punctures dark brown suffused, on each elytra in hind part undefined, blurred, brownish spot. Endemic to Balears .....  
 ..... *majoricensis* FUENTE, 1918.  
 -. Dorsal process of aedeagus slender, at apex more or less thickened ..... 29.



Figs 1194-1199. Aedeagus in dorsal, ventral and lateral view (1194-1196 after WARCHAŁOWSKI 1999; 1197-1199 after SASSI 2004): 1194-1196 – *Cryptocephalus (Burlinius) dahdah*; 1197-1199 – *C. (B.) brevisignaticollis*.

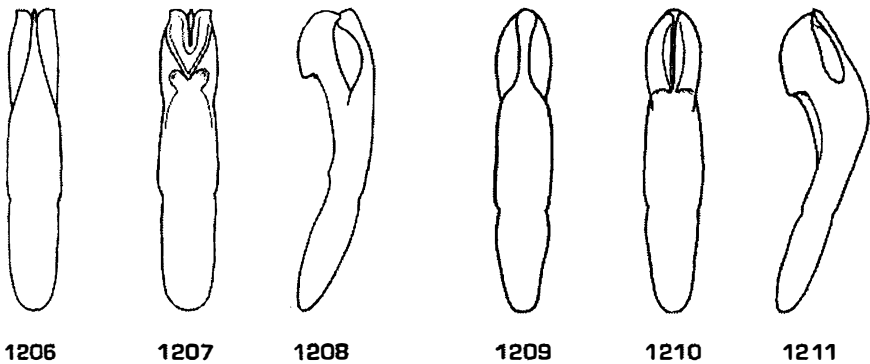


29. Dorsal process of aedeagus (figs 1233–1235) only slightly thickened at apex, lateral process in lateral view elongate, in form of sledge runner. Here pale variations of *pusillus* (auxiliary group D, antithesis 12).
- Dorsal process of aedeagus (figs 1209–1211) rather strongly thickened, club-shaped, lateral process in lateral view shorter and broader. Body entirely pale yellowish except black margins of elytra and pronotum and black abdominal tergites 1–4. Length 2.65 mm. Described from Morocco ..... ***corynetes*** WARCHAŁOWSKI, 1999.



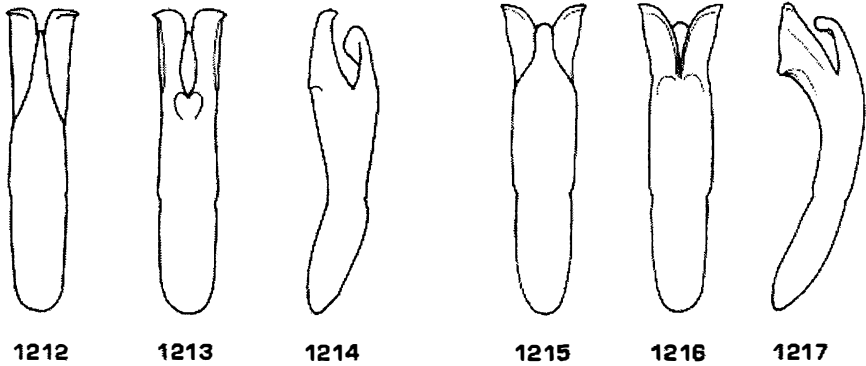
Figs 1200-1205. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1200-1202 – *Cryptocephalus (Burlinius) lostiai*; 1203-1205 – *C. (B.) politus*.

30. Dorsal process of aedeagus rather long, sharpened (fig. 1221) ..... **31.**
- Dorsal process of aedeagus shorter and broader ..... **32.**



Figs 1206-1211. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1206-1208 – *Cryptocephalus (Burlinius) majoricensis*; 1209-1211 – *C. (B.) corynetes*.

31. In male first tarsomere of fore legs somewhat shorter than both following tarsomeres together. Upper side pale yellowish, abdomen black, sometimes with brown apex. Length 2.4–2.9 mm. The variation ab. *limbaticeps* PIC, 1920 (3.5 mm long, with dark head) surely belongs not here. Distributed in Algeria and Tunisia, perhaps identical with *rufipes* ab. *septimanensis* (auxiliary group D, thesis 9) ..... ***abdominalis*** WEISE, 1886.
- . In male first tarsomere of fore legs as long as both following tarsomeres together. Here *rufipes* ab. *septimanensis* (auxiliary group D, thesis 9).

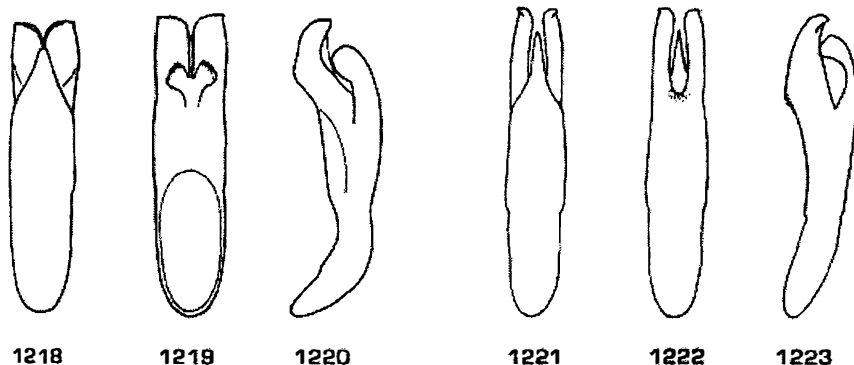


Figs 1212-1217. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1212-1214 – *Cryptophalus (Burlinius) abdominalis*; 1215-1217 – *C. (B.) macellus*.

32. Upper side unicolorous, uniformly pale yellowish. Pronotum sometimes slightly darker, but its colour has the same hue than elytra ..... 33.
- . Upper side bicolorous. Elytra pale yellowish, pronotum pale orange or rust-yellow. Species from N Africa ..... 34.
33. On average larger. Apical part of dorsal process of aedeagus short finger-shaped its apex rounded, often slightly broadened. Body pale, yellowish straw or pale testaceous. Underside mostly blackish or brown, prosternum partly and apex of anal sternite yellowish. Suture of elytra usually very narrowly brownish. Pronotum almost 2 × broader than long. Legs robust. Length 2.1–2.4 mm (= *ochroleucus* SUFFRIAN, 1868, nec FAIRMAIRE, 1859, *iranicus* MEDVEDEV, 1975). Variations: colouration of body as above (typical form), underside pale, yellow amber or brownish (unnamed), on elytra short, blurred, dark longitudinal stripe running backward from humeral callus, scutellum dark (unnamed), on elytra dark stripes distinct, fused with suture as in *connexus* (fig. 1307) (ab. *pseudoconnexus* MÜLLER, 1948). Distributed in great part of W, S and SE Europe and in Asia Minor, reported also from Tunisia ..... ***macellus*** SUFFRIAN, 1860.
- . On average smaller. Apical part of dorsal process of aedeagus approximately triangular, its apex sharpened or at least narrowly rounded. Externally similar to *macellus* (thesis 33), but pronotum longer, not almost 2 × broader than long.

Length 1.9–2.2 mm. Distributed in Corsica, Sardinia and neighbouring small isles ...

- ..... *biondii* SASSI et RENATO, 1998.
34. Apex of dorsal process of aedeagus shortly narrowed and sharpened, its very tip usually darkened or blackish. Here pale variations of *jocularius* (auxiliary group D thesis 39).
- Apex of dorsal process of aedeagus narrowed but not sharpened, its very tip rounded, never darkened or blackish. Here pale variations of *oranensis* (auxiliary group D, antithesis 40).



Figs 1218-1223. Aedeagus in dorsal, ventral and lateral view (after WARCHALOWSKI 1999): 1218-1220 – *Cryptocephalus (Burlinius) biondii*; 1221-1223 – *C. (B.) rufipes*.

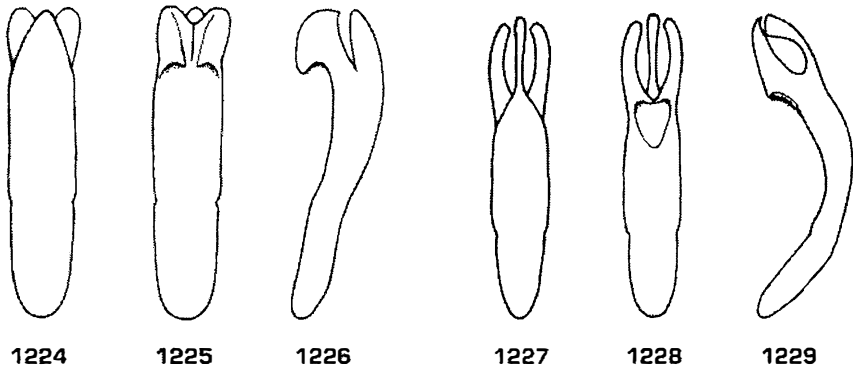
### Auxiliary group D

Pronotum impunctate, upper side entirely dark or with well-defined pattern.

#### Key to species

1. Body black, pattern on head, 4–5 basal antennomeres, fore legs almost entirely, mid and hind legs at least partly yellow. Aedeagus as in figs 1105–1107. Length 1.9–2.3 mm. Here E Palaearctic race of *exiguus* (see auxiliary group B, thesis 12), subsp. *amiculus* Baly, 1873 (= *adocetus* JACOBSON, 1901, *kyosatonus* KIMOTO, 1964).
  - Colouring of body different ..... 2.
2. Disc of elytra black, sometimes with weak bluish metallic reflex. Pale pattern, if present, situated only at anterior margin, epipleura, narrow lateral margins or apex ..... 3.
- Disc of elytra entirely pale, pale with dark pattern or dark with pale pattern .... 30.
3. Upper side black, on apex of elytra oblique, yellow stripe. Forms from Transcaспia. Here two subspecies of *polymorphus* (auxiliary group D, thesis 35) ..... 4.
- Elytra differently coloured ..... 5.
4. Pronotum entirely black *polymorphus* subsp. *parallelus* Jacobson, 1895 (= *norensis* Pic, 1911, described from Tibet).

- Pronotum black with anterior and lateral margins yellow. On scutellum pale spot  
*polymorphus* subsp. *schmidti* JACOBSON, 1894.
- 5. Elytra entirely black or with pale epipleura only ..... 6.
- Elytron either with transverse yellowish spot between scutellum and humeral callus  
or with narrow, sometimes in humeral area broadened and encroaching also upon  
apical part, pale lateral stripe ..... 23.
- 6. Pronotum in both sexes with narrow yellowish stripe along anterior margin .... 7.
- Pronotum entirely black ..... 16.

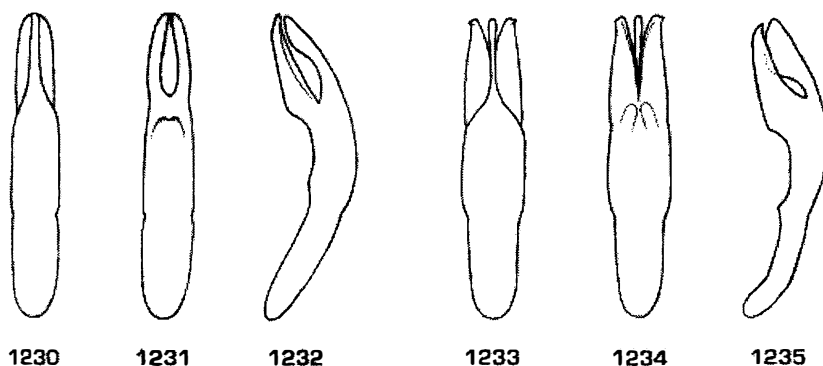


Figs 1224-1229. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1224-1226 - *Cryptocephalus (Burlinius) mystacatus*; 1227-1229 - *C. (B.) pallifrons*.

- 7. Species from Lebanon. Elytra black with pale brownish lateral margins and with trace of paler longitudinal stripe on each. Head mostly and legs pale yellow. Length 2.5 mm (= *pullatus* MARSEUL, 1875). Variation: pale colour on head and legs darker, brownish (ab. *betmeriensis* PIC, 1914). Insufficiently studied species, externally similar to *connexus* (thesis 33) and perhaps conspecific with him ..... *pullus* MARSEUL, 1869.
- Species from other areas ..... 8.
- 8. Dorsal process of aedeagus long, gradually narrowed toward apex or stick-like .... 9.
- Dorsal process of aedeagus broader ..... 13.
- 9. Dorsal process of aedeagus distinctly shorter than lateral processes. Upper side usually tricolorous. Head, pronotum and sometimes small spot on scutellum dark orange, hind margin of pronotum and almost whole surface of elytra black. At humeral callus a creamy spot encroaching also upon epipleura. At apex transverse pale spot, often also creamy but usually darkened, reddish or strongly reduced. Legs and antennomeres 1-5 or 1-6 orange, antennomeres 6-11 brown. Anterior margin of prosternum without triangular process, slightly sinusoidal. Elytra relatively short, their length in male not greater than 0.7, in female not more than 0.6 of body length. In male first tarsomere of fore legs distinctly broadened and elongate. Aedeagus as in figs 1221-1223. General view as in plate XXIX, phot. 256. Colouration of body very

variable. Length 2.4–3.2 mm (= *gracilis* FABRICIUS, 1792, *minutus* FABRICIUS, 1792 nec HERBST, 1783, *vitticollis* WEISE, 1891). Variations: colouration of body as above (typical form = ab. *subflavoapicalis* PIC, 1955), pronotum black with pale anterior and lateral margins, elytra as in typical form (ab. *hispanus* SEIDLITZ, 1891), hind part of pronotum black (two large spot fused), transitional form between forma typica and ab. *hispanus* (ab. *dormeyeri* WAGNER, 1919), as typical form, at scutellum additional yellowish spot (ab. *prescutellaris* PIC, 1913 nec PIC, 1901), pronotum pale, on each elytron pale yellowish spot in the middle and another at apex (ab. *bimaculatus* ČEPELAK), pronotum reddish, on each elytron transverse spot at base and small brownish spot on humeral callus (ab. *timhaditus* PIC, 1949), whole upper side yellowish (ab. *septimanensis* PIC, 1905), as in *bimaculatus*, but median spot fused with pale lateral margin (ab. *signatipennis* PIC, 1913), upper side pale on each elytron two blackish spots on humeral callus and before apex (ab. *pseudoquadrinaevus* PIC, 1913). Distributed in Morocco, Iberian Peninsula, W and S Europe and in a part of M Europe. Distribution in E Europe uncertain, the discussed species being often confused with *pusillus* (antithesis 12) ..... **rufipes** (GOEZE, 1777).

- Dorsal process of aedeagus as long as lateral process ..... **10**.

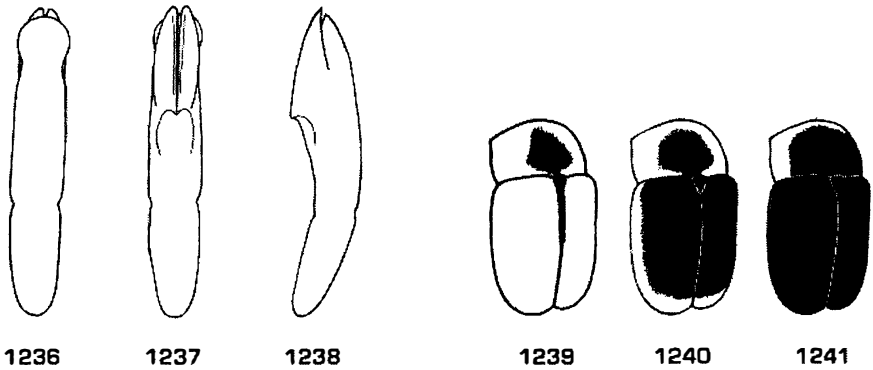


Figs 1230-1235. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1230-1232 – *Cryptocephalus (Burlinius) frontalis*; 1233-1235 – *C. (B.) pusillus*.

10. Dorsal process of aedeagus stick-like ..... **11**.
- Dorsal process of aedeagus (figs **1224–1226**) not stick-like, broad, cone-shaped. Species from Iberian Peninsula. Dorsal process of aedeagus. Upper side black, yellow colour only on head and anterior angles (sometimes also on anterior margin) of pronotum. Fore legs and prosternum yellow, metasternum and abdomen black. In male head almost entirely pale, in female mostly black with yellow clypeus and spots between eyes. Length 2.3–2.7 mm (= *larvatus* SUFFRIAN, 1848). Endemic to Iberian Peninsula ..... **mystacatus** SUFFRIAN, 1848.
11. Elytra with very weak, but always perceptible bluish metallic reflex. Frons entirely yellow (in male) or with narrow brownish median line in hind par (in female). Legs

yellow, hind femora darkened. Underside black. In male epipleura reddish brown or at least with small reddish spot. Aedeagus as in figs 1227–1229. Pronotum as coloured as elytra, in female unicolorous, in male with small pale spots in anterior angles and usually with narrow pale stripe along anterior margin. Length 2.4–3.1 mm (= *insignis* PAYKULL, 1799, nomen dubium, *fuscifrons* MANNERHEIM, 1844, *pallidifrons* CLAVAREAU, 1913 nomen erroneum). One subspecies is described: in female pronotum with pale pattern as in male, in both sexes epipleura yellow (subsp. *irkutensis* CLAVAREAU, 1913, = *epipleuralis* WEISE, 1898, nec JACOBY, 1898 from Mongolia and western part of E Siberia). Distributed from M and N Europe to Mongolia .....

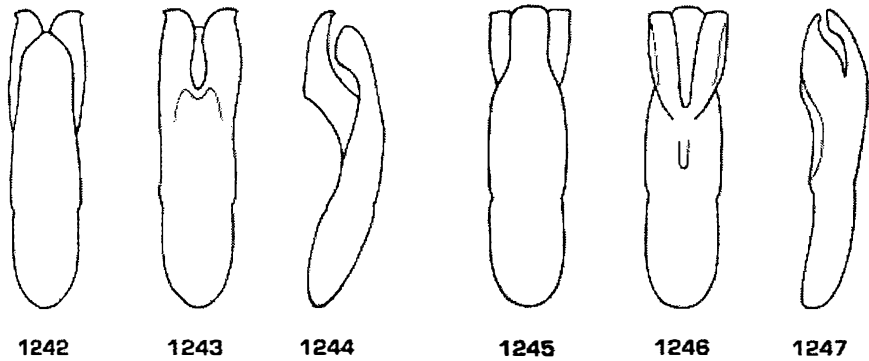
- ..... *pallifrons* GYLLENHAL, 1813.  
 —. Elytra without perceptible metallic reflex. On hind part of frons at least black median line or stripe ..... 12.



Figs 1236-1241. *Cryptocephalus (Burlinius) discicollis* (after WARCHALOWSKI 1999). 1236-1238 – aedeagus in dorsal, ventral and lateral view; 1239-1241 – variations: 1239 – ab. *theresae* PIC, 1900; 1240 – ab. *kabylianus* PIC, 1902; 1241 – ab. *broudeli* PIC, 1900.

12. Pronotum almost entirely black, usually with narrow yellowish stripe along anterior margin and anterior angles. Dorsal process of aedeagus not swollen at apex. Upper side black, labrum, genae, a great part of frons, narrow stripe along anterior margin of pronotum, scutellum and epipleura yellow. Prosternum, all legs and antennomeres 1–4 yellowish amber, remaining parts of underside and pygidium black. Length 2.3–2.6 mm (= *marginellus* GRAVENHORST, 1807, nec DONOVAN, 1801). Species from M Europe and Fennoscandia, distributed from England to basin of upper Volga, in S Sweden and S Finland ..... *frontalis* MARSHAM, 1802.  
 —. Pronotum brown or rust-red, never almost entirely black, sometimes in great part blackish with large, blurred, pale, transversely situated spot in hind part. Colouring of body very variable, aberrations with dark elytra more common. Aedeagus as in figs 1233–1235. In male first tarsomere of anterior legs broadened and strongly elongate, 2 × longer than in female. Length 2.5–2.9 mm (= *sonchi* SCHRANK, 1798, *marginellus* DONOVAN, 1801 nec LINNAEUS, 1758, *minutus* HERBST, 1783 *gracilis* STEPHENS, 1834, *verticalis* BOHEMAN, 1851, *raphaelensis* GAUTIER, 1861 *colini* PIC, 1945, *philiberti* PIC,

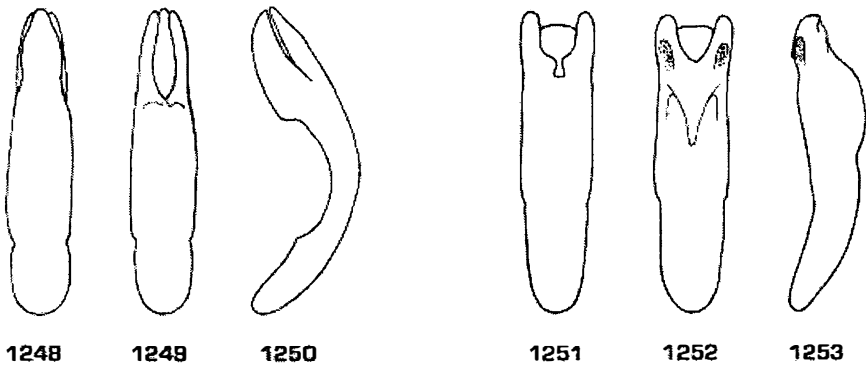
19451). Variations: body entirely pale (ab. *flavissimus* ROUBAL, 1915), body entirely pale with dark spot on humeral callus (ab. *immaculatus* WESTHOFF, 1882), pronotum entirely pale, pattern elytra as in fig. 1181 (typical form), as nominotypical form, on pronotum black pattern as in fig. 1182 (ab. *viduus* WEISE, 1889), pronotum entirely pale, pattern on elytra as in fig. 1183 (ab. *baudyi* PIC, 1945), pronotum entirely pale, on each elytron three blackish spots as in fig. 1184 (ab. *multinigrnotatus* PIC, 1926), pronotum entirely pale, on each elytron two transverse spots as in fig. 1185 (ab. *testouti* PIC, 1945), pronotum entirely pale, elytra black, with pale stripe along lateral and apical sides (ab. *parisiensis* PIC, 1926), pronotum entirely pale, on elytra black pattern as in fig. 1186 (ab. *ernesti* PIC, 1926), pronotum entirely pale, elytra black with pale apex and pale stripe along anterior part of lateral side as in fig. 1187 (ab. *marshami* WEISE, 1882), pronotum pale, elytra black with pale epipleura and pale subhumeral stripe (ab. *muelleri* SCHLEICHER, 1924), extremely dark form, elytra as in ab. *marshami*, on pronotum large black pattern as in fig. 1188 (ab. *planchezi* PIC, 1926). Distributed in almost whole Europe ..... *pusillus* FABRICIUS, 1777.



Figs 1242-1247. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1242-1244 - *Cryptophepalus (Burlinius) scapularis*; 1245-1247 - *C. (B.) daccordii*.

13. Yellow lateral stripe of pronotum broad, sometimes strongly expanded. Fore legs paler than mid and hind legs. Here the commonest form with apical part of elytra entirely black. Colouration of body very variable. In typical form pronotum yellow with large black spot and elytra black with narrow yellow margin and yellow apex. Legs yellow honey, mid and hind legs brownish or brown. On dorsal side of femora usually a narrow dark stripe. Underside black. Prosternum pale, mesoepimeres yellow or at least with yellow spot. General view as in plate XXIX, **phot. 257**. Aedeagus as in figs 1236-1238. Length 2.1-2.3 mm. Variations (figs 1239-1241): colouration of body as above (typical form), elytra pale with shortened black sutural stripe (ab. *theresae* PIC, 1900), each elytron pale with blackish spot in hind part (ab. *favarqi* PIC, 1902), as in *theresae* with additional black humeral spot (ab. *bisignatipennis* PIC, 1900), pronotum pale with large black spot, elytra broadly yellowish margined laterally (ab. *kabylianus* PIC, 1902), elytra entirely black (ab. *broudeli*, PIC, 1900),

- as in typical form, puncturation of upper side particularly fine (ab. *paulopunctatus* PIC, 1907). Distributed in Algeria and Morocco ..... *discicollis* FAIRMAIRE, 1867.
- . Yellow lateral stripe of pronotum narrow, sometimes interrupted in the middle ..... 14
14. Dorsal process of aedeagus distinctly shorter than lateral processes. Epipleura yellow. Head yellow with black vertex, black medial line in upper part of front and two blackish spots over antennal sockets. On pronotum in male anterior and lateral margins, in female anterior margin only, yellowish. Elytra black, in male anterior part of epipleura yellow, in female dark reddish. Length 2.2–2.6 mm. Variation: body colouration in female as in male (ab. *diversus* BURLINI, 1955). Distributed in Italy and Istria ..... *scapularis* SUFFRIAN, 1848.
- . Dorsal process of aedeagus as long as lateral processes or somewhat longer .... 15

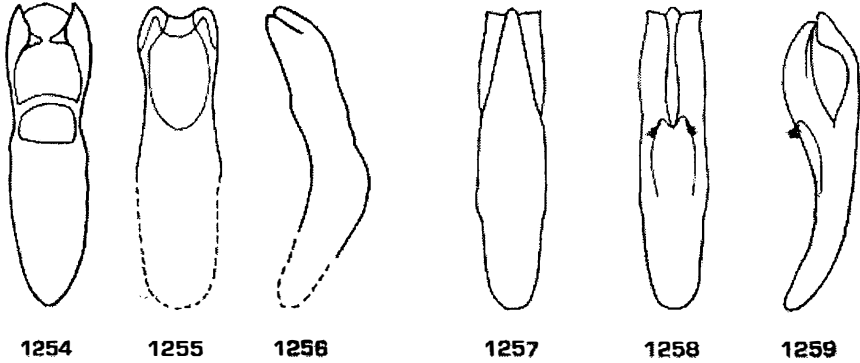


Figs 1248-1253. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1248-1250 - *Cryptophepalus (Burlinius) saliceti*; 1251-1253 - *C. (B.) carpathicus*.

15. Epipleura pale. Upper side black, pronotum with narrow yellowish stripe along anterior and lateral margins. Antennomeres 1–4 or 1–5 yellow, remaining dark brown. Frons yellow, in female with short median blackish line. Underside black, legs yellow. Aedeagus as in figs 1245–1247. In male first tarsomere of fore and mid tarsi broadened and strongly elongate. Length 2.2–2.6 mm. Described from Italy (Calabria) ..... *daccordii* BIONDI, 1995.
- . Epipleura black or pitchy. Body black, yellowish are: labrum, clypeus, narrow anterior and also narrow lateral margins of pronotum. Prosternum dark yellow amber, remaining parts of underside and pygidium black. Prosternum between anterior coxa emarginate with two small lateral finger-shaped processes. Aedeagus as in figs 1248–1250. Length 2.7–3.3 mm. Variations: in female yellow colour on head and anterior margin of pronotum more expanded, finger-shaped processes on prosternum very small (ab. *schaeferi* BURLINI, 1967 described from Corsica), tarsi and tibiae darkened, dark yellow amber (ab. *resinaceus* PIC, 1903). Distributed from S France and N Italy to Brandenburg and W Ukraine ..... *saliceti* ZEBE, 1855.
16. Both lateral margins of pronotum in dorsal view (seen by one eye) visible simultaneously on whole length. Dorsal process of aedeagus (figs 1251–1253)



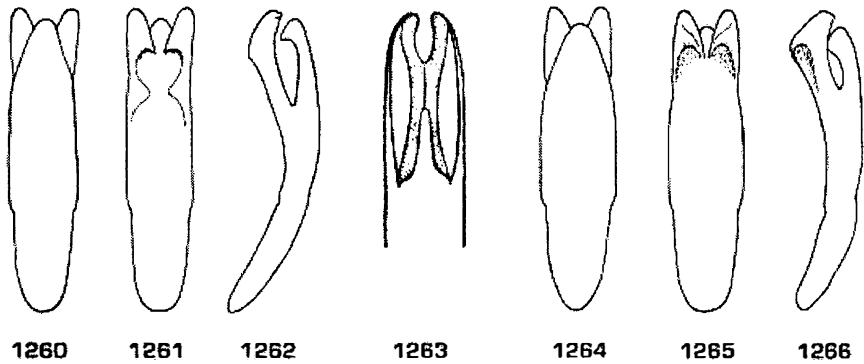
- absent. Body elongate. Upper side black, yellowish are: labrum, antennomeres 1-4 or 1-5, tibiae, partly also tarsi and femora. Apical part of elytra rarely pure black, usually reddish shining trough. General view as in plate XXIX, **phot. 258**. Length 2.5-3.0 mm. Distributed in Carpathians and their vicinity ..... **carpathicus** FRIVALDSZKY, 1883.
- Both lateral margins of pronotum in dorsal view (seen by one eye) visible simultaneously in hind part only. Dorsal process of aedeagus present ..... **17**.



Figs 1254-1259. Aedeagus in dorsal, ventral and lateral view (1254-1256 after LOPATIN and CHIKATUNOV 2000; 1257-1259 after WARCHAŁOWSKI 1999): 1254-1256 – *Cryptocephalus (Burlinius) nigellus*; 1257-1259 – *C. (B.) ocellatus*.

17. Upper side entirely black, underside of body also black, underside of antennomeres 1-3 and tibiae partly yellow. Aedeagus as in figs **1254-1256**. Length 2.3 mm. Described from Israel ..... **nigellus** LOPATIN et CHIKATUNOV, 2000.
- At least anterior part of head pale ..... **18**.
18. Head black, clypeus and genae yellow, on frons two rather large, roundish-triangular yellow spots. Basal part of antennae and all legs yellow, remaining parts of body black Dorsal process of aedeagus (figs **1257-1259**) evenly narrowed toward apex, longitudinally triangular. Length 2.4-3.2 mm (= *geminus* GYLLENHAL, 1827, *ochropezus* SUFFRIAN, 1853, *hummleri* PIC, 1909). Variations: colouration of body as above (typical form), in hind angles of pronotum small yellowish spot (ab. *corsicus* PIC, 1909), legs darkened, tarsi partly black (ab. *montanellus* MÜLLER, 1948), in females frons black, without yellow spots (ab. *nigrifrons* BEDEL, 1899), in females colouration as in *nigrifrons*, additionally all femora darkened (unnamed). Distributed in whole Europe (except The British Isles) approximately to 55° N and in N Kazakhstan ..... **ocellatus** DRAPIEZ, 1819.
- Frons differently coloured ..... **19**.
19. Prosternum in the middle of its anterior margin with small triangular tooth, usually visible in lateral view without the necessity to unglue the specimen. In both sexes anterior part of head yellow and frons black, in male sometimes with two little

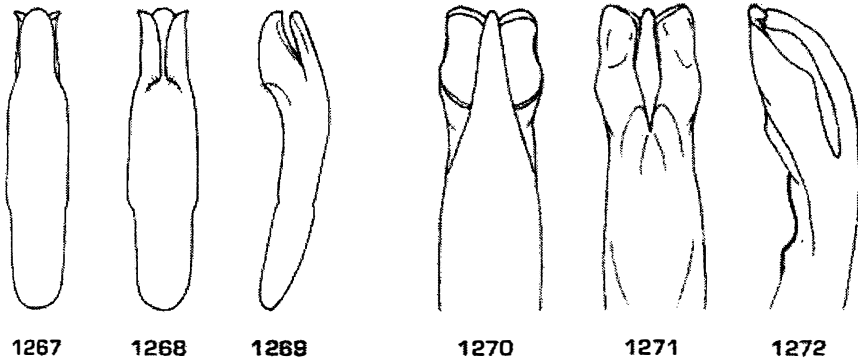
- pale spots. Body black except mentioned part of head, prosternum, coxae (at least partly), entire fore legs, mid and hind tibiae yellow-amber ..... 20.
- . Prosternum without tooth-like process ..... 21.



Figs 1260-1266. Aedeagus in dorsal, ventral and lateral view (1263 after Medvedev 1992, remaining after WARCHAŁOWSKI 1999): 1260-1262 – *Cryptocephalus (Burlinius) labiatus*; 1263 – *C. (B.) kurentzovi*; 1264-1266 – *C. (B.) variceps*.

20. Dorsal process of aedeagus (figs **1260–1262**) thick, cone-shaped, slightly shorter than lateral processes. Length 2.2–2.8 mm (= *exilis* STEPHENS, 1832, *longicornis* THOMSON, 1866). Variations: colouration of body as above (typical form), mid and hind legs entirely dark, pitchy brown (ab. *exilis* STEPHENS, 1834), along inner margin of eye runs narrow, yellowish stripe (ab. *digrammus* SUFFRIAN, 1848), in male on frons two little reddish spots (ab. *ocularis* HEYDEN, 1863). Distributed in Europe, from about 42° N to North Cape, in N Kazakhstan, Mongolia and Siberia to Far East (Sakhalin) ..... **labiatus** (LINNAEUS, 1761).
- . Dorsal process of aedeagus (fig. **1263**) narrow, 2 × shorter than lateral processes. Described from Kuril Islands. Here specimens of *kurentzovi* (auxiliary group B, thesis 5) with weakly punctured pronotum.
21. Smaller. Upper side black, antennomeres 1–5 and legs yellow. In male head yellow with two blackish spots upper antennal sockets and median line on hind part of frons. Hind femora sometimes darkened in basal part. In female anterior part of head yellow, frons and vertex black. Aedeagus as in figs **1264–1266**. Length 2.1–2.4 mm (= *areshanus* PIC, 1914, *karsantianus* PIC, 1914). Variation: female coloured as male (ab. *kuchtai* BREIT, 1918). Distributed in Asia Minor, Caucasian countries and Iran, considered often as subspecies of *exiguus* (auxiliary group B, thesis 12) ..... **variceps** WEISE, 1884.
- . Larger. Body black, anterior part of head, antennomeres 1–4 or 1–5 and legs yellow-amber. On femora along dorsal side usually narrow brownish stripe. Two species similar to each other ..... **22**.
22. Aedeagus as in figs **1267–1269**. Length 2.7–3.3 mm. Variations: colouration of body as above (typical form), on frons between eyes two small reddish dots

- (ab. *subocularis* REITTER, 1912). Distributed in Europa except Iberian Peninsula, to about 63°N ..... *querceti* SUFFRIAN, 1848.
- Aedeagus as in figs 1270–1272, remaining characters as in *querceti*, but slightly smaller, hind femora stronger darkened and elytra finer punctured. Known from Italy only ..... *paganensis* PIC, 1914.
23. Pronotum and elytra black, on each elytron pale yellowish transverse stripe between humeral callus and scutellum and a small subhumeral stripe. In male on pronotum anterior margin narrowly yellowish, anterior part of head pale, yellow colour fused with two pale spots between eyes. In female whole upper side black except mentioned stripes on elytra and two yellow spots between eyes. Epipleura in male partly yellow, in female partly reddish. Aedeagus as in figs 1273–1275. Length 2.1–2.8 mm. Variations: on each elytron additionally pale transverse stripe at apex (ab. *galeazzii* Pic, 1900), in female frons entirely black (ab. *solarii* BURLINI, 1967). Distributed in W France, N Italy, N Balcan, Austria, Hungary, Slovakia and basin of Dnestr ....  
..... *strigosus* GERMAR, 1824.
- Elytron without transverse pale stripe at anterior margin. Pale stripe, fused with apical spot, runs along lateral margins of elytron ..... 24.

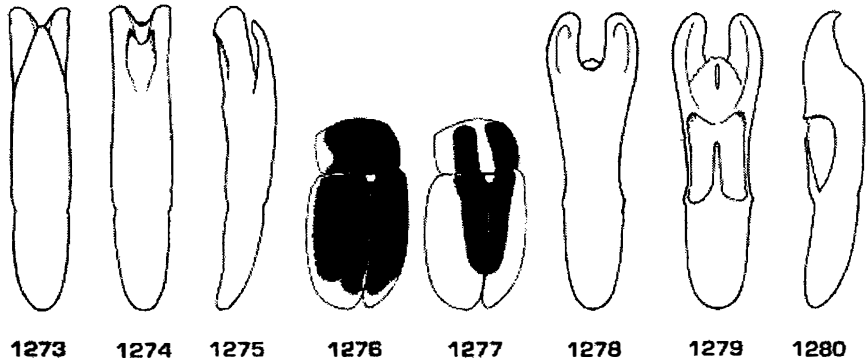


Figs 1267–1272. Aedeagus in dorsal, ventral and lateral view (1267–1269 after WARCHAŁOWSKI 1999; 1270–1272 after SASSI 2004): 1267–1269 – *Cryptocephalus (Burlinius) querceti*; 1270–1272 – *C. (B.) paganensis*.

24. Elytra with distinct blue metallic reflex ..... 25.  
- Elytra without metallic reflex ..... 26.
25. Scutellum white, trapezium-shaped. Very variably coloured. Male. Body smaller (2.3–2.7 mm). Head black with labrum and clypeus pale, sometimes also with narrow yellowish stripe at each eye. Ground colour of pronotum and elytra black with bluish or greenish metallic reflex. On pronotum lateral margins (broader) and anterior margin (narrower) yellowish. On elytra epipleura, marginal stripe and apical spot pale. Underside black. Female. Larger (2.6–3.1 mm). Upper side entirely pale yellowish or with black-blue pattern (see variations), underside black with yellow margins of abdomen, sometimes in great part pale. General view as in plate

XXIX, phot. 259. Aedeagus as in figs 1278–1280 (= *scutellaris* TRUQUI, 1852, nec FABRICIUS 1801, *ulmineus* TRUQUI, 1852, *discus* TRUQUI, 1852, *alboscutellatus* SUFFRIAN, 1853, *nigradorsum* CHEVROLAT, 1860, *ragusanus* ROUBAL, 1912). Variations (figs 1276, 1277): male – colouration as above (typical form), female – upper side entirely pale (typical form = ab. *immaculatissimus* PIC, 1902), female – upper side pale with black shortened sutural stripe and a interrupted lateral stripe black (ab. *escaleraei* PIC, 1908), female – upper side yellowish, on elytron sutural and lateral stripe black (ab. *teniensis* PIC, 1900), female – pronotum yellow, on elytra black sutural stripe in posterior part very strongly widened (ab. *discus* TRUQUI, 1852), female – upper side pale, on pronotum two longitudinal stripes, on elytra rather broad, shortened sutural stripe black (unnamed). Distributed in Morocco, Algeria, Tunisia, Iberian Peninsula, Balears, Sicily and southern Italy ..... ***saucius*** TRUQUI, 1852.

–. Scutellum black. Upper side mostly black with bluish or bronzy metallic reflex. Along lateral sides of pronotum and elytra runs narrow pale stripe, apex of elytra broader yellowish. Underside entirely black, legs yellow, usually with partly darkened tarsi. General view as in plate XXIX, phot. 260. Aedeagus as in figs 1281–1283. Length 2.5–3.2 mm). Variations: lateral pale stripes on pronotum and elytra disappear, apical pale spot present only (ab. *rifanus* BURLINI, 1962), elytra almost entirely pale, with short, black sutural stripe at scutellum only (ab. *latecinctus* PIC, 1908). Distributed in N Africa, in all mountain ranges being parts of the High- and Tell Atlas ..... ***pallidocinctus*** FAIRMAIRE, 1867.

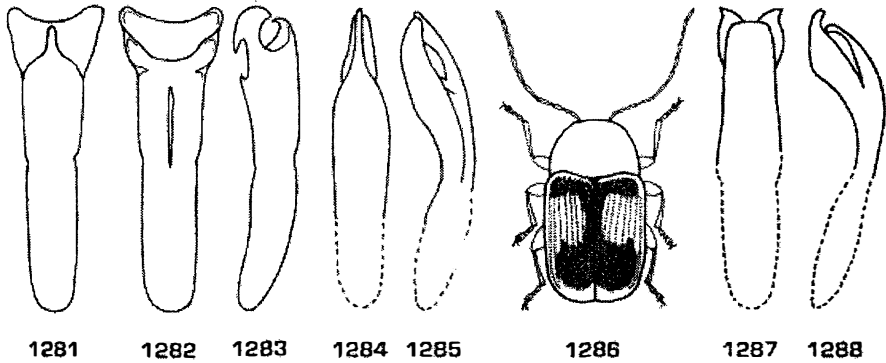


Figs 1273-1280. Colour variations and aedeagus in dorsal, ventral and lateral view (after WARCHALOWSKI 1999): 1273-1275 – *Cryptocephalus (Burlinius) strigosus*; 1276-1280 – *C. (B.) saucius*: 1276 – typical form; 1277 – unnamed variation; 1278-1280 – aedeagus.

26. Species from Central Asia. Pronotum orange with black hind margin, elytra black with lateral sides and apex orange, legs dark yellow. General view as in plate XXIX, phot. 261. Aedeagus as in figs 1284, 1285. Length 3.0–4.0 mm. Described from Kirgisia ..... ***appositus*** LOPATIN, 1958.

–. Species from other areas ..... 27.

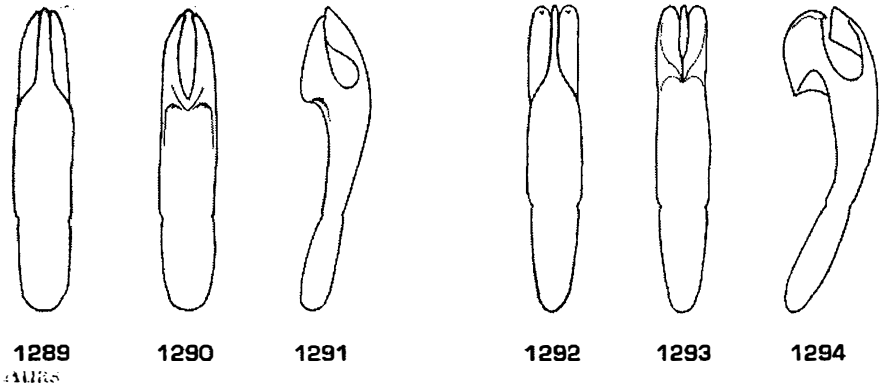
27. Pronotum rust-yellow or reddish, often with darker, undefined spots. Yellowish lateral stripe on elytra usually broadened in the middle. Males generally darker coloured, dark pattern on elytra more distinct. Aedeagus as in figs **1286–1288**. Length 2.3–2.6 mm. Variation: pronotum entirely brown (ab. *lostiae* BURLINI, 1942). Endemic to Sardinia ..... ***alnicola*** COSTA, 1885.  
 -. Pronotum black, laterally and anteriorly narrowly yellowish margined ..... **28**.



Figs 1281-1288. General view and aedeagus in dorsal, ventral and lateral view (1284, 1285 after LOPATIN 1977, remaining after WARCHAŁOWSKI 1999): 1281-1283 – *Cryptocephalus (Burlinius) pallidocinctus*; 1284, 1285 – *C. (B.) appositus*, 1286-1288 – *C. (B.) alnicola*.

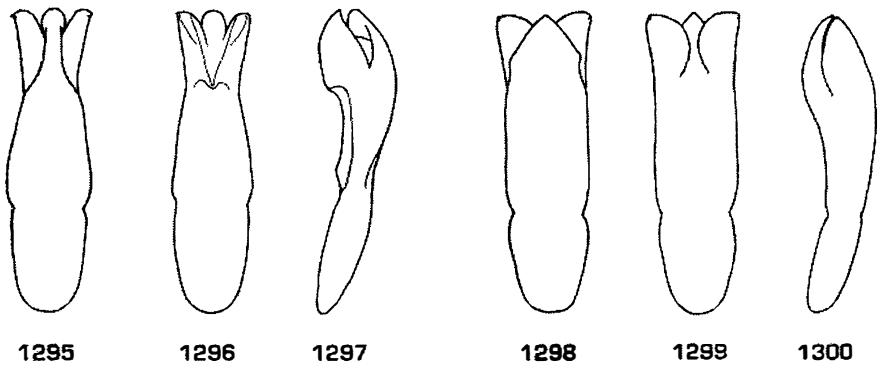
28. Species from W and M Europe. Ground of upper side black, in female labrum, clypeus, frontal pattern and apical part of elytra, in male additionally anterior and lateral margins of pronotum and lateral margins of elytra yellow. Antennomeres 1–4 or 1–5 and legs entirely yellow. General view as in plate XXX, **phot. 262**. Aedeagus as in figs **1289–1291**. Length 2.1–2.7 mm (= *biguttatus* SCHALLER, 1783 nec SCOPOLI, 1763, *huebneri* FABRICIUS, 1792, *haemorrhoidalis* SCHNEIDER, 1792 nec OLIVIER, 1791). Variations: female – on frons two approximately triangular yellow spots, pronotum entirely black (typical form = ab. *pillichi* KASZAB, 1962), female – on frons yellow spots fused with supraantennal spots as in male (unnamed), female – colouration of frons and pronotum as in male (unnamed). Distributed in Europe approximately between 42°N and 53°N, from S and W France to Crimea and NW Turkey ..... ***chrysopus*** GMELIN, 1788.  
 -. Species from Mediterranean part of Europe ..... **29**.  
 29. Species from Spain. Dorsal process of aedeagus (figs **1292–1294**) thin. Colouration of body as in *chrysopus* or in some variations of *saucius* (thesis 25) without metallic reflex on upper side. Insufficiently studied species, considered as endemic to Sierra Nevada, but probably distributed more broadly in Iberian Peninsula ..... ***limbifer*** SEIDLITZ, 1867.  
 -. Species from Italy. External characters and colouration of body as in *chrysopus* (thesis 28). Aedeagus as in figs **1295–1297**. Length 2.2–2.4 mm. Variations: on frons

large black spot, yellow apical spot on elytra considerably reduced (ab. *latenigriceps* PIC, 1953), anterior margin of pronotum pale, anterior margin of elytra with traces of transverse, reddish stripe (ab. *toscanensis* PIC, 1953), as *toscanensis*, but with yellow scutellum (ab. *luigionii* PIC, 1953), elytra with pale anterior margin and with trace of transverse reddish band (ab. *subiacosus* PIC, 1953). Known from different parts of Italy only ..... ***czwalinae*** WEISE, 1882.



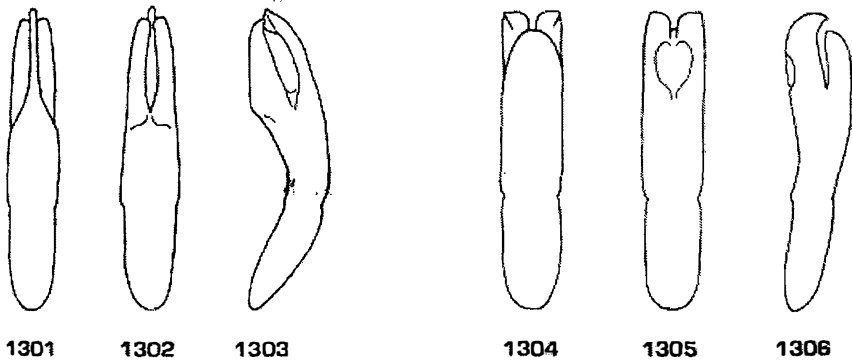
Figs 1289-1294. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1289-1291 - *Cryptocephalus (Burlinius) chrysopus*; 1292-1294 - *C. (B.) limbifer*.

- 30. Pronotum dark with pale anterior and lateral margins, elytra yellowish with black pattern or entirely pale ..... 31.
- Pronotum entirely pale or pale with blackish pattern ..... 34.



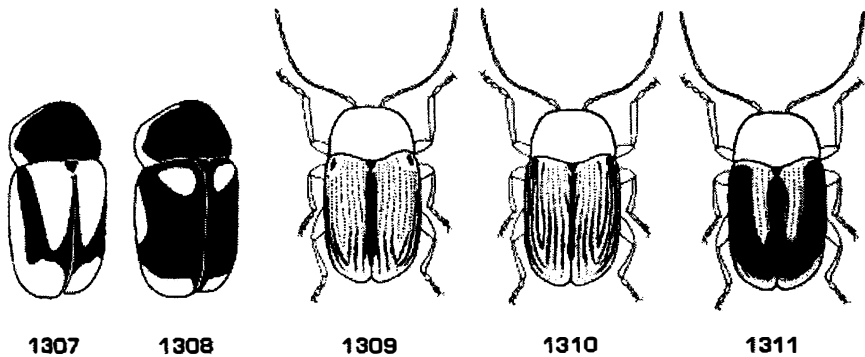
Figs 1295-1300. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1295-1297 - *Cryptocephalus (Burlinius) czwalinae*; 1298-1300 - *C. (B.) katranus*.

31. Body very small, broad and stout. Elytra entirely yellow. Pale margins of pronotum sometimes expanded. Scutellum yellow with narrow blackish margins, elytra uniformly yellowish. General view as in plate XXX, **phot. 263**. Aedeagus as in figs **1298–1300**. Externally very similar to Iberian species *moroderi* (thesis 25) but differing by shape of aedeagus and geographical distribution. Length 1.9–2.4 mm. Described from Jordan ..... ***katranus*** LOPATIN, 1997.
- Body somewhat larger, elytra with black pattern ..... **32.**



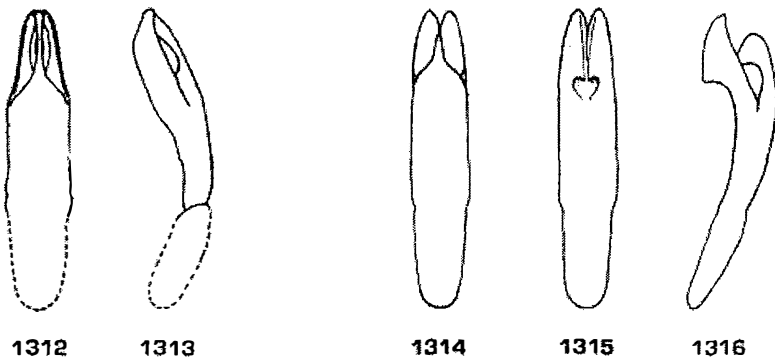
Figs 1301-1306. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1301-1303 – *Cryptocephalus (Burlinius) polymorphus*; 1304-1306 – *C. (B.) connexus*.

32. Pronotum in greatest part black. Elytra yellowish with small black spot on humeral callus and with narrow black sutural stripe. Here W Mediterranean forms of *pygmaeus* (auxiliary group B antithesis 25).
- Dark colour on pronotum expanded differently, but lateral yellow stripes (relatively broad and with somewhat blurred margins) are always present ..... **33.**



Figs 1307-1311. Pattern on upper side of body (after WARCHAŁOWSKI 1999): 1307, 1308 – *Cryptocephalus (Burlinius) connexus*: 1307 – typical form; 1308 – *ab. fasciatus*; 1309-1311 – *C. (B.) jocularius*, unnamed variations.

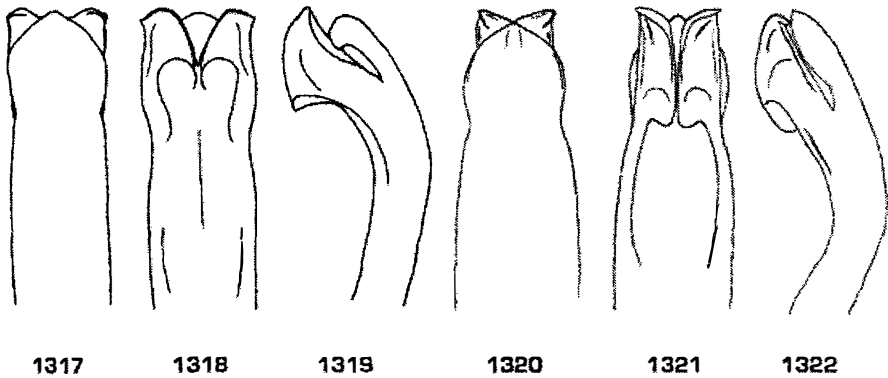
33. Dark colour on pronotum forms two large, brown fused spots with broadly blurred margins, elytra entirely and scutellum at least in the middle yellow. Here paler form of *katranus* (thesis 31).
- . Dark colour on pronotum forms two black spots at basal margin or covers greatest part of surface, on elytra always at least humeral spot black. Scutellum black (fig 1307). Body rather stout, upper side bicolorous, underside black or pitchy. Legs yellow amber, in darker coloured specimens femora and tarsi brownish. General view as in plate XXX, **phot. 265**. Aedeagus as in figs 1304–1306. Length 2.3–2.8 mm (= *ochraceus* CURTIS, 1840 nec STEPHENS, 1829). Variations: pronotum entirely pale, black stripes on elytra separate (ab. *lichtneckerti* KASZAB, 1962), pronotum entirely pale, black stripes on elytra fused (ab. *heterepistaticus* KASZAB, 1962), pronotum pale with two black spots at hind margin, black stripes on elytra separate (ab. *sajoi* KASZAB, 1962), pronotum pale with two black spots at hind margin, black stripes on elytra fused (ab. *arenarius* WEISE, 1882), pronotum black with anterior and lateral margins yellow, on elytra black humeral spot only (ab. *reductevittatus* KASZAB, 1962 = *kaszabanus* BURLINI, 1963), pronotum black with anterior and lateral margins yellow, black stripe on elytra divided into two longitudinal spots, sutural stripe very narrow (ab. *bisireductellus* KASZAB, 1962), pronotum black with anterior and lateral margins yellow, black stripes on elytra separate, sutural stripe well-developed (ab. *subconnexus* WEISE, 1882), pronotum black with anterior and lateral margins yellow, black stripes on elytra fused with sutural stripe (ab. *ahngeri* JACOBSON, 1901), pronotum black with anterior and lateral margins yellow, elytra black, each with three yellow spots (ab. *fasciatus* PETRI, 1912, = *petrii* KASZAB, 1962, fig. 1308). Distributed in Europe south of Alps and Carpathians, in Asia Minor, Caucasian countries, Ukraine and basin of upper Volga to Transcaspiia. Perhaps here *bidorsalis* MARSEUL, 1875 and (conspecific with him) *brevisignaticollis* PIC, 1914 from Lebanon ..... **connexus** OLIVIER, 1808.
34. Pronotum entirely yellowish or with blurred brownish darkening (here also some variations of *connexus*, antithesis 33) ..... 35.
- . Pronotum with blackish pattern ..... 44.



Figs 1312-1316. Aedeagus in dorsal, ventral and lateral view (1312, 1313 after LOPATIN 1977, remaining after WARCHAŁOWSKI): 1312, 1313 – *Cryptocephalus (Burlinius) invisus*; 1314-1316 – *C. (B.) jocularius*.



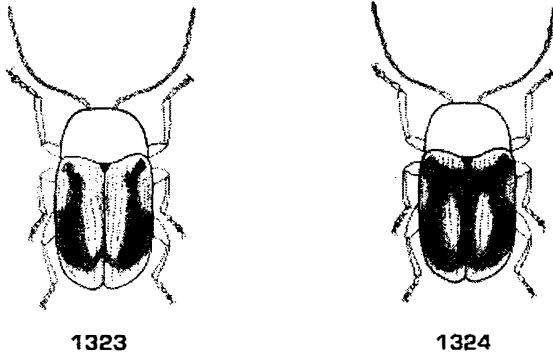
35. Upper side pale, on each elytron one oder two (sometimes fused), usually large black spots. General view as in plate XXX, **phot. 264**. Aedeagus as in figs **1301–1303**. Length 2.4–3.1 mm (= *disjunctipennis* PIC, 1907, *quadrinaevus* PIC, 1907). Variations: on each elytron two black spots (typical form), on each elytron black spots fused into a broad, longitudinal stripe (unnamed), on each elytron hind spot present only (unnamed), elytra entirely pale, without spots (ab. *laevifrons* WEISE, 1894). Forms three subspecies: upper side coloured as above (nominotypical subspecies), upper side almost entirely black (subsp. *schmidti* JACOBSON, 1894 from Kirgisia and subsp. *parallelus* JACOBSON 1895 from Tadzihikistan), see also thesis and antithesis 3. Distributed in mountain ranges being parts of the Tian-Shan ..... ***polymorphus*** SOLSKY, 1881.
- . Not as above ..... **36.**



Figs 1317-1322. Aedeagus in dorsal, ventral and lateral view (after SASSI 2004): 1317-1319 – *Cryptocephalus (Burlinius) pseudosindonicus*; 1320-1322 – *C. (B.) rabatensis*.

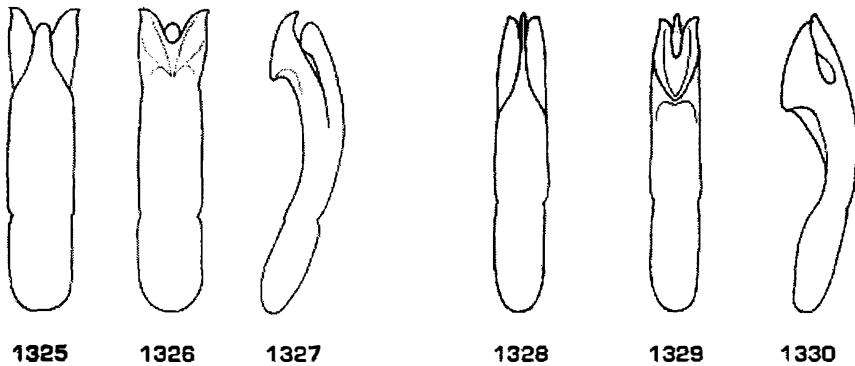
36. Body length 3.5–4.0 mm. Species from Transcaspia. Upper side orange, anterior margin and hind angles of pronotum yellow. Elytra sometimes uniformly orange, but usually with black pattern (humeral spot and anchor-shaped pattern in hind part), often fused as in plate XXX, fig. **267**. Legs pale. Aedeagus as in figs **1312, 1313**. Distributed in mountains of S Kazakhstan and Tadzihikistan ..... ***invisus*** LOPATIN, 1963.
- . Body length under 3.0 mm. European and mediterranean species ..... **37.**
37. Upper side pale yellow or yellow clay. On elytra blackish pattern often with blurred margins. Here different aberrations of *pusillus* (antithesis 12) and *rufipes* (thesis 9).
- . Pronotum dark yellow orange or pale rust-red. Elytra yellow with discal longitudinal blackish stripe, often fused with sutural stripe before apex, sometimes divided into numerous small black dots. Five species similar to each other from W Mediterranean area ..... **38.**
38. Pattern on elytra less sharp, somewhat blurred, variable, only rare pure black ..... **39.**

- Pattern on elytra pitchy or black, sharply margined, well contrasting on pale ground. Upper side yellow to orange, on elytra black sutural stripe and longitudinal discal stripe, usually fused in apical part ..... 42.



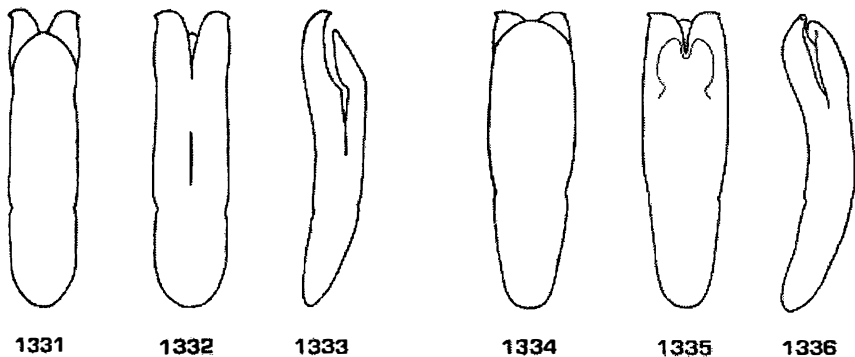
Figs 1323, 1324. Elytral pattern in *Cryptocephalus (Burlinius) oranensis* (after WARCHALOWSKI 1999): 1323 – unnamed variation; 1324 – typical form.

- 39. Pattern on elytra tends to divide into narrow longitudinal stripes running along rows of punctures. Black sutural stripe usually narrow, sometimes disappearing. Legs pale. General view as in plate XXX, phot. 266. Aedeagus as in figs 1314–1316. Length 2.0–2.3 mm (= *mogadoricus* PIC, 1950, *baguenai* BURLINI, 1961). Commonest variations as in figs 1309–1311. Distributed in N Africa from Morocco to Tunisia and in S Spain ..... *jocularius* NORMAND, 1947.
- Dark pattern on elytra often partly blurred (see also *pulchellus*, antithesis 43) or disappearing ..... 40.



Figs 1325-1330. Aedeagus in dorsal, ventral and lateral view (after WARCHALOWSKI 1999): 1325-1327 - *Cryptocephalus (Burlinius) oranensis*; 1328-1330 - *C. (B.) blanduloides*.

40. Dorsal process of aedeagus very broad, slightly narrowed before apex. Pronotum coloured somewhat differently than elytra, being slightly reddish, as in *pulchellus* (antithesis 43) ..... **41.**
- Dorsal process of aedeagus (figs **1325–1327**) in apical part narrowed, somewhat finger-shaped. Length 1.8–2.4 mm. Variations: elytra pale with black sutural stripe and longitudinal discal on each (typical form), discal stripe on elytra interrupted (ab. *signifer* PIC, 1905), discal stripe on elytra interrupted and shortened (ab. *semiinterrupta* PIC, 1905), elytra entirely blackish (ab. *discolugubris* PIC, 1905), elytra pale with dark humeral spot (ab. *petiti* PIC, 1904). Species known from Algeria only ..... **oranensis** WEISE, 1882.
41. Pronotum somewhat shorter. Aedeagus as in figs **1317–1319**. Length about 2.4 mm. Known from Morocco, described and later revised based on one couple only ..... **pseudosindonicus** BURLINI, 1960.
- Pronotum somewhat longer. Aedeagus as in figs **1320–1322**. Length about 2.4 mm. Possibly conspecific with *pseudosindonicus* (thesis 41). Described from Morocco based on one male only ..... **rabatensis** PIC, 1953.
42. Dorsal process of aedeagus long and thin (figs **1328–1330**). General view as in plate XXX, **phot. 268**. Length 2.1–2.3 mm (= *inconnexus* NORMAND, 1947). Distributed in Morocco, Algeria and Tunisia ..... **blanduloides** NORMAND, 1947.
- Dorsal process of aedeagus short and broad ..... **43.**
43. Smaller. General view as in plate XXX, **phot. 269**. Aedeagus as in figs **1331–1333**. Length 1.8–2.0 mm (= *pallidus* KRAUSE, 1911). Endemic to Sardinia, perhaps conspecific with *pulchellus* (antithesis 43) ..... **equiseti** COSTA, 1888.
- Larger. General view as in plate XXX, **phot. 270**. Aedeagus as in figs **1334–1336**. Length 2.1–2.4 mm (= *blandulus* HAROLD, 1872). Variations: black pattern blurred, elytra brown paler in scapular area, at scutellum and on apex (ab. *fuentanus* ROUBAL, 1913), black discal stripe interrupted in its midlength (ab. *mimicus* PIC, 1905), black pattern reduced to sutural stripe and humeral spot (ab. *henoni* PIC, 1914). Distributed in European part of W Mediterranean area ..... **pulchellus** SUFFRIAN, 1848.



Figs 1331-1336. Aedeagus in dorsal, ventral and lateral view (after WARCHAŁOWSKI 1999): 1331-1333 – *Cryptocephalus (Burlinius) equiseti*; 1334-1336 – *C. (B.) pulchellus*.

- 44. Scutellum whitish, broad, trapezium-shaped. Colour variation of *saucius* (thesis 25).
  - Scutellum brown or black, triangular, sometimes with reddish spot ..... 45
- 45. On pronotum large blackish spot with blurred margins. Elytra pale, unicolorous or with humeral spot. Pale forms of *discicollis* (thesis 13).
  - On pronotum two black spots at hind margin. Ground colour of elytra yellow ... 46
- 46. Body broad and stout. Dorsal process of aedeagus cone-shaped. Here some W Mediterranean forms of *pygmaeus* (auxiliary group B, thesis 25).
  - Body not particularly broad and stout. Dorsal process of aedeagus broadly rounded. Here pale variations of *connexus* (thesis 33) and dark variations of *fulvus* (auxiliary group C, thesis 22).

Subgenus *Cerodens* BURLINI, 1953

One species only. Head, pronotum, underside and legs black, a few basal antennomeres reddish, elytra red, narrow sutural stripe and on each elytron two transverse stripes black. Posterior stripe usually fused with sutural stripe. Length 4.0–4.8 mm (= *kocheri* BURLINI, 1953, nec PIC 1953). General view as in plate XL, **phot. 356**. Variation: on each elytra both stripes reduced, posterior stripe free (ab. *pseudorugicollis* KOCHER, 1953). Occurs in Morocco ..... *emiliae* KOCHER, 1955.

Subgenus *Cryptocephalus* s. str.

Key to auxiliary groups

- 1. Upper side entirely or partly (pronotum or elytra) covered by hairs ..... auxiliary **group A** (p. 251).
  - Upper side hairless or at most with several hairs near anterior angles of pronotum ..... 2
- 2. On upper side black parts or/and black patterns with distinct metallic reflex or sheen ..... 3.
  - On upper side black parts without metallic lustre, at most with very weak metallic reflex ..... 4
- 3. Upper side entirely black with metallic lustre, sometimes only basal part of antenna, genae and clypeus reddish or yellowish ..... auxiliary **group B** (p. 255).
  - Upper side not entirely black with metallic lustre, at least pattern on frons or fore legs yellowish, reddish or testaceous ..... auxiliary **group C** (p. 265).
- 4. Upper side entirely black ..... auxiliary **group D** (p. 272).
  - Upper side not entirely black ..... 5.
- 5. Pronotum entirely black ..... 6.
  - Pronotum not entirely black ..... 7.
- 6. Legs entirely black ..... auxiliary **group E** (p. 273).
  - Legs entirely or partly yellow or reddish ..... auxiliary **group F** (p. 277).
- 7. Pronotum entirely pale, reddish, testaceous, yellowish or brownish, apart from black posterior margin (and sometimes also very narrowly blackened lateral marginal

- ridge) without any well-defined black pattern, at most with blurred, undefined brownish spots ..... auxiliary **group G** (p. 280).
- Pronotum bicolorous ..... **8**.
8. Elytral punctures arranged in regular or almost regular rows at least on inner half of elytra ..... auxiliary **group H** (p. 287).
- Elytral punctures random or only here and there arranged in semiregular rows .... **9**.
9. Ground colour of elytra black ..... auxiliary **group I** (p. 298).
- Ground colour of elytra yellow or reddish ..... **10**.
10. Mid and hind femora black or blackish, in distal part with roundish white spot ..... auxiliary **group J** (p. 302).
- Femora without white spots ..... auxiliary **group K** (p. 305).

### Auxiliary group **A**

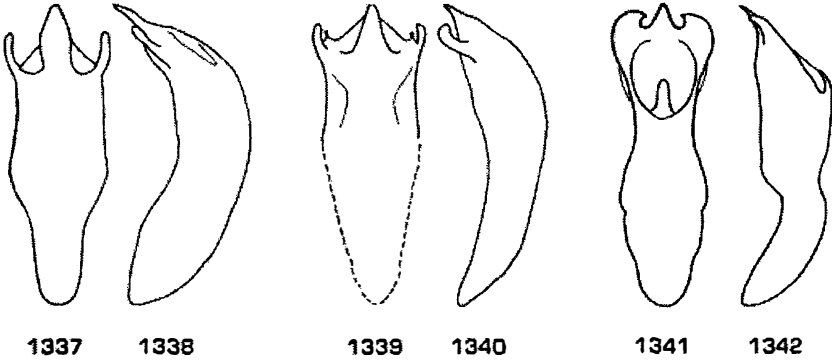
Pronotum and/or elytra covered by hairs.

#### Key to species

1. Elytra entirely hairless, pronotum haired ..... **2**.
- Elytra covered by erect hairs or pubescent ..... **6**.
2. Body length exceeding 6.0 mm ..... **4**.
- Body length does not exceed 5.5 mm. Head and pronotum green with bluish reflex. Elytra yellow normally with two (humeral and postmedian) black spots. Underside and legs black with bluish metallic reflex ..... **3**.
3. Apical part of aedeagus (figs **1337**, **1338**) more elongate. General view as in plate XXXI, **phot. 271**. Length 4.0–5.5. The most part of variations described as *ilicis* (antithesis 3) belongs probably here. Distributed in western part of Mediterranean area (Iberian Peninsula, France, Italy). Perhaps a western race of *ilicis* (antithesis 3) ..... **etruscus** SUFFRIAN, 1847.
- Apical part of aedeagus (figs **1339**, **1340**) shorter. Distributed in eastern part of Mediterranean area (Greece, Asia Minor, Near East) and in Sicily. Length 4.0–5.5 mm (= *siculus* HERRICH-SCHÄFFER, 1836). Seven variations were described, the most important are: elytron without black spots (ab. *obliteratipennis* PIC, 1900), elytron with humeral spot only (ab. *humerinotatus* BURLINI, 1955), elytron with two (1, 1) spots (typical form), elytron with three (1, 2) spots (ab. *prinkipensis* PIC, 1908), elytron with four (2, 2) spots (ab. *blocki* MARSEUL, 1875). Distributed in Mediterranean area ..... **ilicis** OLIVIER, 1808.
4. Elytra red, covered by numerous black, irregularly scattered small hollows. General view as in plate XXXI, **phot. 272**. Aedeagus similar as in *tristigma* (figs **1343**, **1344**). Length 6.0–8.5 mm. Variations: on each elytron, apart from black hollows, two (ab. *punctonotatus* PIC, 1900) or three (ab. *subcicatricosus* PIC, 1908) black spots. Distributed in north-western Africa, reported also from southern Spain ..... **cicatricosus** LUCAS, 1845.
- Surface of elytra even, red with three little black spots (humeral spot and two black dots behind middle) ..... **5**.
5. An European species. General view as in plate XXXI, **phot. 273**. Aedeagus as in figs **1341**, **1342**. Length 6.0–8.5 mm (= *sexmaculatus* OLIVIER, 1791, nec FABRICIUS,

1781, see genus *Tituboea*). Variations: on each elytron two black spots (1, 1) only (typical form), on each elytron three (1, 2) black spots (ab. *sexmaculatus* OLIVIER, 1791). Distributed in northern Italy, southern France and in Iberian Peninsula ....  
 ..... ***obliteratifer*** PIC, 1891.

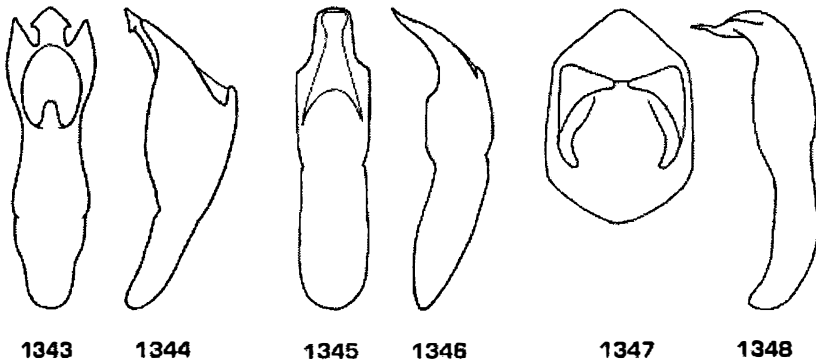
- Essentially an African species, in Sicily and Calabria occurs subsp. *tristigma hirticollis* SUFFRIAN, 1847, without metallic lustre on pronotum and with rather slender aedeagus. Apex of aedeagus (figs 1343, 1344) in lateral view crooked down. Anterior tibiae a little curved inward. Length 6.0–9.5 mm (= *normandi* PIC, 1900, *bedeli* PIC, 1900, *diversepunctatus* PIC, 1937, *marocanus* PIC, 1953). Variations: body relatively slender (ab. *tangerianus* PIC, 1908), elytra uniformly red, without black pattern (ab. *mizanensis* PIC, 1900), elytron with humeral spot only (*antoinei* KOCHER, 1958), elytron with two (0, 2) black spots (ab. *arbensis* PIC, 1900), elytron with one (0, 1) spot (ab. *gandolphei* PIC, 1902), posterior spots jointed (ab. *pseudobarathraea* DANIEL, 1899), between humeral spot and scutellum a supplementary spot, both posterior spots jointed in a short transverse stripe (ab. *mimeuri* PIC, 1949). Nominotypical subspecies distributed in Morocco, Algeria and Tunisia, reported also from Iberian Peninsula, the subspecies *hirticollis* as above ..... ***tristigma*** CHARPENTIER, 1825.



Figs 1337-1342. Aedeagus in dorsal and lateral view (1337-1340 after SASSI 1995; 1341, 1342 after WARCHAŁOWSKI 1994): 1337,1338 – *Cryptocephalus (Cryptocephalus) etruscus*; 1339, 1340 – *C. (C.) ilicis*; 1341, 1342 – *C. (C.) obliteratifer*.

- 6. Elytra covered by short semiadpressed hairs, tibiae and femora rust-reddish. Elytra pale brick-reddish with black spots as in *baeticus* (thesis 9). Aedeagus not studied. Length 4.5–5.5 mm. Distributed in Asia Minor and Caucasian countries. See *C. (Asionus) flexuosus*, the ?form *amasiensis* (auxiliary group C, thesis 6).
- Elytra with erect or semierect hairs, legs black ..... 7.
- 7. E Palearctic species ..... 8.
- W Palearctic species ..... 9.
- 8. Body uniformly blue black often with violaceous reflex, sometimes labrum and clypeus reddish. Aedeagus characteristic, as in figs 1345, 1346. Length 3.9–5.1 mm. Distributed in Mongolia, E Siberia, N China and Korea, considered also as synonym of *regalis* (antithesis 8) ..... ***hieracii*** WEISE, 1889.

- Underside and legs usually black with greenish reflex, antennae black. General view as in plate XXXI, **phot. 274**. Pronotum and elytral pattern metallic green or blue. Colouring of elytra variable, yellow with dark pattern or uniformly dark green, blue or violaceous. Aedeagus as in figs **1347, 1348**. Length 3.9–5.4 mm. Several forms and a few subspecies, at present considered as synonyms were described (= *pilosus* BALY, 1873, *cyanescens* WEISE, 1875, *dauricus* WEISE, 1882, *angaricus* FRANZ, 1949, *sutschanus* MACHATSCHKE, 1959). The most important aberrations are: elytra dark yellow, on each elytron three (2, 1) large, often partly confluent spots (typical form), on each elytron two small spots in basal part and a large spot before apex (ab. *tournieri* PIC, 1909), elytra metallic green, each with a small yellow spot at apex (ab. *flavoposticatus* HEYDEN, 1887), on each elytron a broad longitudinal stripe (unnamed), elytra uniformly metallic green or blue (ab. *mutatus* KRAATZ, 1879). Distributed in Mongolia, N China, E Siberia and Korea. Its occurrence in Japan doubtful, corresponding reports concern *C. (Asionus) hirtipennis* (see subsp. *Asionus*, auxiliary group A, thesis 3) ..... **regalis** GEBLER, 1830.

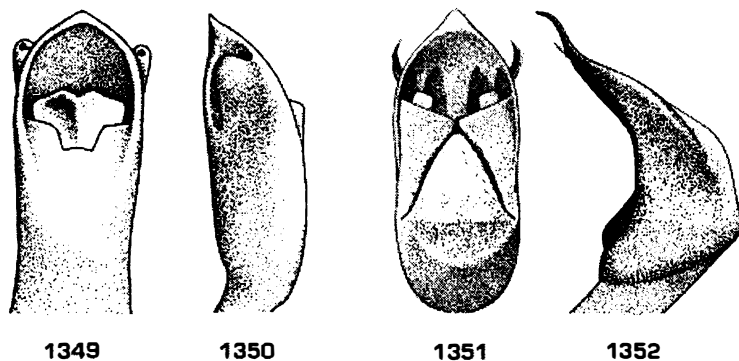


Figs 1343-1348. Aedeagus or its apical part in dorsal and lateral view (1343-1344 after WARCHAŁOWSKI 1994; 1345, 1346 orig.; 1347, 1348 after LOPATIN and DOVGAILO 2002): 1343, 1344 – *Cryptocephalus (Cryptocephalus) tristigma*; 1345, 1346 – *C. (C.) hieracii*; 1347, 1348 – *C. (C.) regalis*.

9. Upper side black, rather sparsely haired, antennae reddish. Pronotum finely and thickly punctate, punctures of elytra moderately strong, subregular. Aedeagus not studied. Length about 6.0 mm. Described from Algeria ..... **baborensis** PIC, 1914.
- Body black, elytra dark yellow or reddish, usually with black pattern. Two species similar to ewach other from Spain ..... **10**.
10. Upper side tricolorous: yellow with dark reddish pattern on pronotum and with also dark reddish undefined longitudinal stripes on elytra ..... **11**.
- Upper side bicolorous ..... **12**.
11. Larger, lateral processes on apex of aedeagus (figs **1349, 1350**) small. General view as in plate XXXI, **phot. 275**. Elytron all round narrowly black margined and with four (2, 2) little black spots. Punctures of elytra variable, regular, semiregular or confuse. Elytra covered by erect hairs, pronotum hairless. Length 4.6–6.0 mm

(= *muelleri* BURLINI, 1955, nec GMELIN, 1790). Occurs in Spain .....  
 ..... ***muellerianus*** BURLINI, 1948.

- Smaller, lateral processes on apex of aedeagus much larger, apical part somewhat trilobed. Externally similar to *muellerianus* (thesis 11), but smaller. Length 3.3–4.3 mm. Occurs in Central Spain ..... ***bahilloi*** LÓPEZ-COLÓN, 2004.



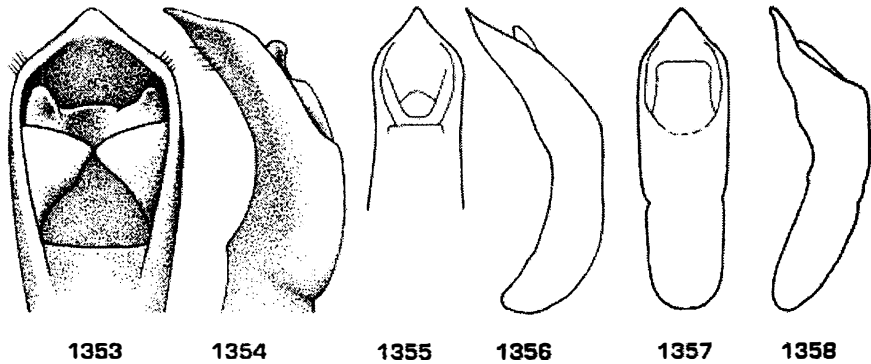
Figs 1349-1352. Aedeagus in dorsal and lateral view (after PETTPIERRE 2000): 1349, 1350 – *Cryptocephalus (Cryptocephalus) muellerianus*; 1351-1352 – *C. (C.) baeticus*.

12. Apical part of aedeagus (figs **1351**, **1352**) longer, in lateral view distinctly curved. General view as in plate XXXI, **phot. 276**. Head and pronotum black with feeble bluish reflex. Elytra dark yellow with black spots. Punctures of pronotum elongate, but his surface not strongly, longitudinally wrinkled. Length 4.0–5.5 mm. Variations: elytron with three (2, 1) black spots (typical form), two anterior spots free, posterior spot fused with sutural stripe (ab. *mekalisius* PIC, 1900), all three spots fused (ab. *biprolongatus* PIC, 1936), both anterior spots joined, posterior spot fused with sutural stripe (unnamed, sometimes identified with *azurescens*, see auxiliary group C, antithesis 16). Distributed in Iberian Peninsula, Morocco and Algeria ..... ***baeticus*** SUFFRIAN, 1847.

- Apical part of aedeagus (figs **1353**, **1354**) shorter, in lateral view insignificantly curved. General view as in plate XXXI, **phot. 277**. Surface of pronotum usually covered by dense, longitudinal wrinkles. Coloured as *baeticus* (thesis 9), but ground colour of elytra a little darker, usually orange or reddish. Length 4.0–5.5 mm (= *wagneri* KÜSTER, 1845, *virgatus* SUFFRIAN, 1847, *verrucosus* SUFFRIAN, 1847, *exclamationis* WEISE, 1891, *mekalianus* PIC, 1900, *x-signatus* PIC, 1911). Twelve variations were described, the most important are: pronotum indistinctly rugose (ab. *sexnotatus* FABRICIUS, 1792), each elytron with three black spots (typical form), elytron entirely reddish, without spots (ab. *seynei* BURLINI, 1955), elytra with humeral spots only (ab. *humeralis* FABRICIUS, 1801), each elytron with two spots (ab. *vasquezi* PIC, 1911 and *pseudovasquezi* TIBERGHIEAN, 1971), each elytron with four spots (ab. *octonotatus* VITALE, 1933), on each elytron all spots joined (ab. *perroudi* PIC,



1905), elytra entirely black (ab. *subverrucosus* PIC, 1908). Distributed in western part of Mediterranean area (from Morocco and Portugal to north-eastern Italy ....  
 ..... ***rugicollis*** OLIVIER, 1791.



Figs 1353-1358. Aedeagus in dorsal and lateral view (1353, 1354 after PETITPIERRE 2000; 1355, 1356 after LOPATIN and DOVGAILO 2002; 1357, 1358 after WARCHAŁOWSKI 1991): 1353, 1354 – *Cryptocephalus (Cryptocephalus) rugicollis*; 1355, 1356 – *C. (C.) splendens*; 1357, 1358 – *C. (C.) parvulus*.

### Auxiliary group B

Pronotum and elytra uniformly black with metallic sheen.

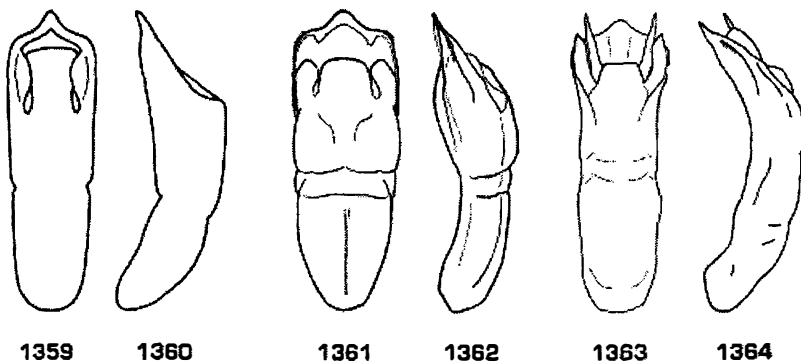
#### Key to species

1. Clypeus and genae at least partly yellowish (B2) ..... **2**
- . Clypeus and genae black (B1) ..... **9**
2. Pronotum strongly punctured ..... **3**
- . Pronotum moderately or finely punctured ..... **6**
3. E Palaearctic species. Upper side with rather vivid greenish-blue metallic sheen. Genae, labrum, anterior margin of clypeus, 3 or 4 basal antennomeres and fore tibia dark yellow. Legs never black, usually brownish or brown, on underside paler, femora at least on dorsal side dark brown or blackish. Aedeagus as in figs **1355**, **1356**. General view as in plate XXXI, **phot. 278**. Length 4.0–4.6 mm (= *zubovskiyi* JACOBSON, 1894, *flavoirroratus* CHEN, 1942). Distributed in Mongolia, Siberia from Altai to basin of Ussuri and in Sakhalin ..... ***splendens*** KRAATZ, 1879.
- . W Palaearctic species ..... **4**
4. Anterior trochanteres yellowish. General view as in plate XXXI, **phot. 9**. shorter than the first. Aedeagus as in figs **1357**, **1358**. Length of body in male 3.0–3.7 mm, in female 3.4–4.1 mm (= *nigrocoeruleus* GOEZE, 1777, *flavilabris* FABRICIUS, 1787, *livens* GMELIN, 1790, *coeruleus* OLIVIER, 1791, *inurbanus* HAROLD, 1874, *consolanus* BALY, 1874 *fulcratus* GERMAR, 1824, *obliquostriatus* MOTSCHULSKY, 1866, *nitens* ROSSI, 1792 nec LINNAEUS, 1761, *permodestus* BALY, 1873, *violaceus* GEOFFROY, 1785

- nec LAICHARTING, 1781, *devillei* MÜLLER, 1948). Variations: upper side black with greenish-blue metallic lustre (typical form), upper side pure blue, green or violaceous (unnamed aberrations), upper side black, margins of pronotum and of elytra blue (ab. *klettei* GERHARDT, 1909), pronotum bronzy-green, elytra black-blue (ab. *burlinii* TIBERGHEN, 1971). In Corsica and Sardinia occurs subsp. *devillei* MÜLLER, 1948 with finer and shallower punctures of pronotum. Distributed from northern Spain, Ireland and southern Norway to Central Asia ..... *parvulus* MÜLLER, 1776.
- . Anterior trochanteres black. In male pronotum without impressions, third tarsomeron at least by 1/3 shorter than the first. General view as in plate XXXII, **phot. 280**. Upper side dark blue, shining. Aedeagus shaped similarly as in *androgynae* (thesis 6). Length 3.5–4.7 mm. Often considered as a subspecies of *androgynae* (group B, thesis 6). Distributed in Iberian Peninsula, southern France and Asia Minor ..... *pelleti* MARSEUL, 1875.
5. Punctures of apical part of elytra very fine or at least distinctly finer and more sparsely scattered than on anterior half. Upper side in both sexes black-blue ..... 6.
- . Punctures on apical part of elytra not or insignificantly finer than on disc. In male elytra uniformly black-blue or with little reddish apical spots, in female elytra yellowish, all round black margined ..... 8.
6. European species. Upper side blue-black (typical form), genae and clypeus (sometimes partly) ivory. Legs entirely black. General view as in plate XXXII, **phot. 281**. In male first tarsomere of fore legs narrower than tarsomere 3 and shorter than tarsomeres 2+3 together. Aedeagus as in figs **1359, 1360**. Length 3.9–4.5 mm (male) to 4.2–5.2 mm (female) (= *coerulescens* SAHLBERG, 1839 nec GMELIN, 1790, *matsumurai* TAKIZAWA, 1971). Variations: upper side black-violaceous (unnamed), head and pronotum black, elytra blue-black (ab. *distractus* BURLINI, 1967), in female behind humerus a little, blurred, pale spot (ab. *praehumeralis* PIC, 1908), in female on apex of elytron a pale, transverse stripe (unnamed), in female on elytron both pale spots present (ab. *larozei* PIC, 1908). Distributed in middle and northern part of Europe. Here also *modestus* SUFFRIAN, 1848 (thesis 9) described from basin of Volga, almost surely conspecific with *androgynae* ..... *androgynae* MARSEUL, 1875.
- . E Palaearctic species ..... 7.
7. Pygidium semicircular, wholly covered by punctures and pubescence, in lateral view almost flat or weakly convex. Upper side steel blue with metallic lustre. Pygidium with a sharp and deep furrow on lateral lobe parallel to margin. Aedeagus as in figs **1361, 1362**. Distributed in Japan (Honshu, Shikoku, Kyushu) ..... *aeneoblitus* TAKIZAWA, 1975.
- . Pygidium somewhat trapezium-shaped, in hind part slightly but distinctly sloping downward. Aedeagus as in figs **1363, 1364**. External characters as in *androgynae* (thesis 6), General view as in plate XXXII, **phot. 282**. In male first tarsomere of fore legs as broad as tarsomere 3 and as long or longer than tarsomeres 2+3 together. Length 4.2–4.9 mm (male) to 4.5–5.4 mm (female) (= *approximatus* BALY, 1873, *fortunatus* BALY, 1873). Variations: metallic reflex of upper side vivid greenish (ab. *iturupenis* MEDVEDEV, 1966), upper side blue-greenish with strong violaceous reflex, legs more darkened (ab. *sikotanensis* MEDVEDEV, 1966). Distributed in E Siberia, Korea, N China and Japan ..... *hyacinthinus* SUFFRIAN, 1860.
8. Aedeagus as in figs **1365, 1366**. In female elytral pattern in plate XXXII, **phot. 283**. Length 4.0–4.4 mm (male) to 4.3–4.8 mm (female) (= *albopectoralis* PIC,

1908, *devaulxi* MÉQUIGNON, 1948, *palliatu*s SUFFRIAN, 1861). Variations: in male pronotum and elytra uniformly blue-black (typical form), in male on elytron a little pale apical spot (ab. *terminatus* GERMAR, 1824), in male on each elytron three (2, 1) little, pale, blurred spots (ab. *pseudoterminatus* BURLINI, 1948), in female colour variations and their names see figs 1372–1375. Distributed in France, Netherlands, northern Italy, Germany, southern Poland, basin of Danube and Romania. Here also *grohmanni* SUFFRIAN, 1848, not significantly different (in male on elytron apical spot usually present, aedeagus as in *marginatus*), probably an Italian race of *marginatus*, occurring in southern Italy and Sicily ..... ***marginatus*** FABRICIUS, 1781.

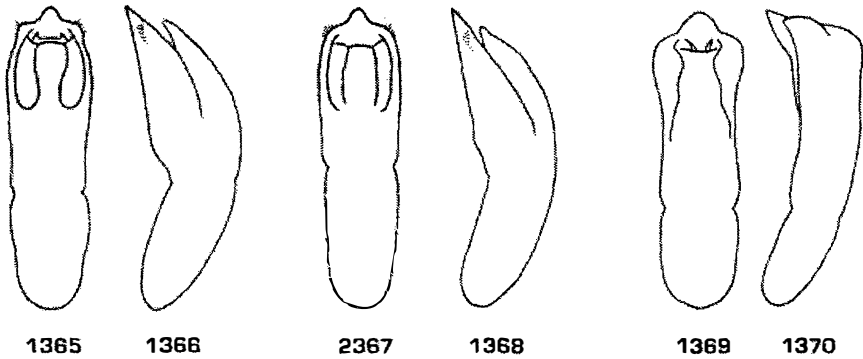
-. Aedeagus as in figs 1367, 1368. In female elytral pattern as in plate XXXII, phot. 284. Length 4.2–4.5 mm (= *concinuus* SUFFRIAN, 1853). Distributed in basin of Danube, Bulgaria, Crimea, northern Turkey, Caucasian countries and northern Iran. Reported also from southern France. Described from Crimea ..... ***bicolor*** ESCHSCHOLTZ, 1818.



Figs 1359–1364. Aedeagus in dorsal and lateral view (1359, 1360 after WARCHAŁOWSKI 1991, remaining after TAKIZAWA 1975): 1359, 1360 – *Cryptocephalus (Cryptocephalus) androgynae*; 1361, 1362 – *C. (C.) aeneoblitus*; 1363, 1364 – *C. (C.) hyacinthinus*.

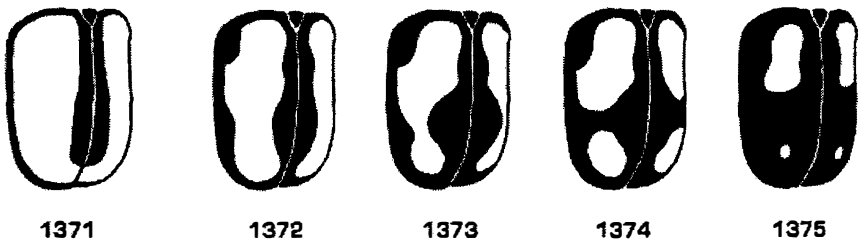
9. Length of body under 3.5 mm. Pronotum without punctures, glassy. Body black with feeble bluish metallic reflex, sometimes pure black. Length 2.9–3.4 mm. Variation: frons finely rugose (ab. *rugulifrons* JACOBSON, 1895). Distributed in basin of Volga and in Siberia ..... ***modestus*** SUFFRIAN, 1848.
- . Length of body at least 3.5 mm. Pronotum punctate ..... **10.**
10. Body elongate, anterior part of pronotum distinctly constricted. Upper side relatively strongly punctate, in both sexes dark coloured ..... **11.**
- . Body not elongate, pronotum rather broad, normally formed ..... **12.**
11. Aedeagus as in figs 1369, 1370. Length 3.5–4.0 mm. Distributed in Italy, Balkan Peninsula and in Hungary ..... ***gridellii*** BURLINI, 1955.
- . Aedeagus as in figs 1376, 1377. Length 3.5–4.3 mm. Distributed in basin of Danube, southern Ukraine and southern Russia ..... ***elongatus*** GERMAR, 1824.
12. Metallic sheen of upper side aeneous or cupreous. Pronotum strongly and closely punctate. Elytra somewhat rugose, puncturation tending to form irregular stripes.

- Aedeagus not studied. Length 3.6–3.8 mm. Described from N China (Kansu) ....  
 ..... *cupreatus* CHEN, 1942.
- . Metallic sheen of upper side green, bluish-green or bluish, rarely with purplish or  
 violaceous hue ..... 13.



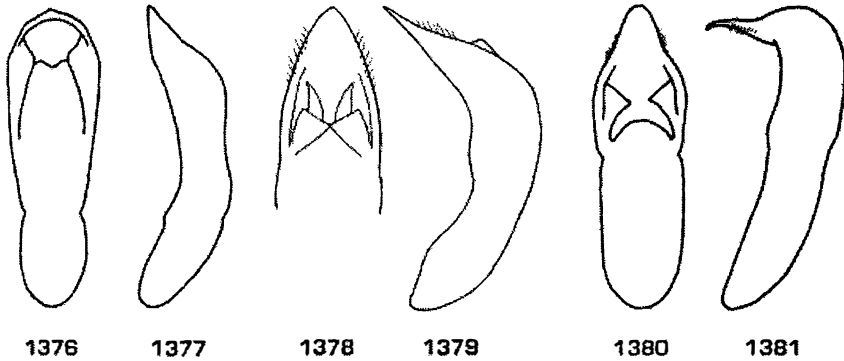
Figs 1365-1370. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1991): 1365, 1366 – *Cryptocephalus (Cryptocephalus) marginatus*; 1367, 1368 – *C. (C.) bicolor*; 1369, 1370 – *C. (C.) gridellii*.

13. Lateral margin of pronotum widened and flattened on a short fragment in posterior part only ..... 14
- . Lateral margin of pronotum widened and flattened (in posterior part stronger) on whole length ..... 21
14. In male hind tibia in distal part with a flat broadening and incision. General view as in plate XXXII, **phot. 284**. Length 4.5–4.7 mm (= *poeciloceras* HEYDEN, 1870). Variations: upper side with violaceous reflex, epipleura anteriorly yellowish (ab. *fauconneti* PIC, 1911), in female on each elytron a yellowish preapical spot (ab. *lapicidinarum* PIC, 1907), in female antennomera 1–5 reddish (ab. *ligeris* PIC, 1901). Distributed in southern France and in Iberian Peninsula .....  
 ..... *tibialis* BRISOUT, 1866.
- . In male tibiae without ridge in distal part ..... 15.



Figs 1371-1375. Elytral pattern in female (after WARCHAŁOWSKI 1991): 1371 – *Cryptocephalus (Cryptocephalus) bicolor*; 1372-1375 – *C. (C.) marginatus*: 1372 – typical form; 1373 – ab. *discoidalis* BURLINI, 1946; 1374 – ab. *crucifer* BURLINI, 1946; 1375 – ab. *wellschmiedti* BURLINI, 1961.

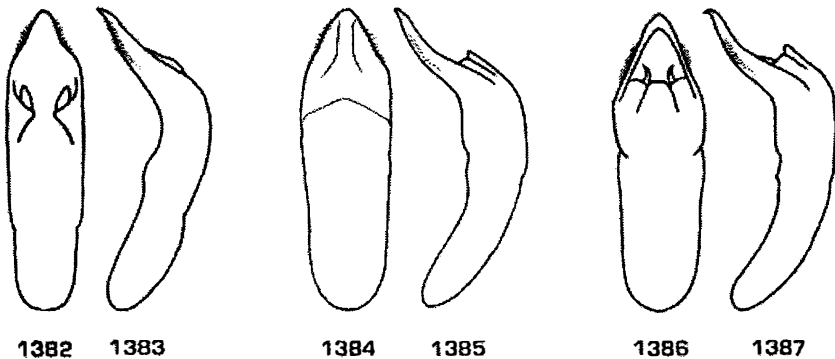
15. Pronotum laterally less convex, both lateral margins in dorsal view simultaneously visible on whole or on almost whole length. Last abdominal sternite without a short transverse ridge ..... **16.**
- Pronotum laterally strongly convex, both lateral margins in dorsal view simultaneously visible only in hind part. Here four species very similar to each other, distinguishable only by the structure of aedeagus and of last abdominal sternite in male ..... **17.**



Figs 1376-1381. Aedeagus in dorsal and lateral view (1378, 1379 after LOPATIN and DOVGAILO 2002, remaining after WARCHAŁOWSKI 1991): 1376, 1377 – *Cryptocephalus (Cryptocephalus) elongatus*; 1378, 1379 – *C. (C.) leonhardi*; 1380, 1381 – *C. (C.) virens*.

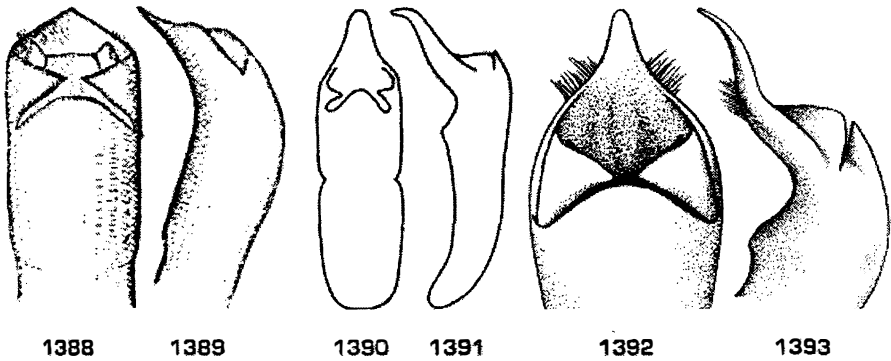
16. Pronotum laterally a little constricted, both lateral margins in dorsal view simultaneously visible on whole length. Surface of pronotum relatively strongly and deeply punctate, interstices shining, secondary punctures here and there present, but rather indistinct. Upper side black with greenish-bronzy reflex, usually almost pure black, metallic reflex very feeble. Aedeagus not studied. Length 4.5–5.2 mm. Distributed in Spain ..... ***asturiensis*** HEYDEN, 1870.
- Pronotum not constricted, both lateral margins in dorsal view simultaneously visible almost on whole length (without anterior angles). Upper side sculpture and colouring as in *asturiensis* (thesis 13). Aedeagus as in figs **1378**, **1379**. Length 4.2–5.0 mm. Distributed in northern Italy, Alps, Slovenia and Croatia. Reported also from basin of Danube ..... ***leonhardi*** BREIT, 1918.
17. Punctures of pronotum very sparse and fine. In central part of surface interstices 4–5 times broader than diameter of punctures. Last abdominal sternite in male without particular details. Upper side dark bluish-green. Aedeagus as in figs **1380**, **1381**. Length 4.4–5.4 mm. Distributed in east-southern Europe from Italian Alps and Bavaria to Balkan Peninsula, southern Russia and Asia Minor ..... ***virens*** SUFFRIAN, 1847.
- Punctures of pronotum stronger and more deeply scattered, in central part of surface interstices 1–2 times broader than diameter of punctures. Last abdominal sternite with transverse ridge. Upper side dark bluish-violeous or bluish-black ..... **18.**

18. In male last abdominal sternite at the middle of anterior margin with a short transverse ridge. General view as in plate XXXII, **phot. 286**. Aedeagus as in figs **1382, 1383**. Length 5.0–6.0 mm. Variations: elytral punctures here and there arranged in semiregular rows, ground without sheen, finely rugose (unnamed), metallic lustre of upper side greenish-black with bronzy or golden reflex (ab. *smaragdinus* SUFFRIAN, 1847), pronotum bronzy, elytra dark greenish (ab. *morelianus* PIC, 1953), pronotum bronzy-green, elytra dark blue (ab. *viridicollis* HÄNEL, 1934), upper side black, almost without metallic reflex (ab. *sepulchralis* CSIKI, 1953). In Appennino Toscano (Italy) occurs a local form with deep, roundish impression on last abdominal sternite in male (subsp. *scaffaiolus* BURLINI, 1961). Distributed in western, middle and south-eastern Europe from Spain to Ukraine and Asia Minor ..... **violaceus** LAICHARTING, 1781.
- . In male last abdominal sternite at the middle of anterior margin with a arcuate or roof-shaped transverse ridge ..... **19**.
19. In male last abdominal sternite deeply impressed, in addition of the arcuate transverse ridge at anterior margin, with a transverse bulge along posterior margin. Aedeagus as in figs **1384, 1385**. Length 4.5–5.0 mm (= *unicolor* FALDERMANN, 1837 nec OLIVIER, 1791, *persicus* RAPILLY, 1980). Distributed in Caucasian countries and in northern Iran ..... **concolor** SUFFRIAN, 1847.
- . In male last abdominal sternite shallowly impressed, the ridge at anterior margin roof-shaped. Aedeagus as in figs **1386, 1387**. Length 4.8–5.4 mm. Distributed in eastern part of Balkan Peninsula and in Asia Minor ..... **duplicatus** SUFFRIAN, 1847.
20. Both lateral margins of pronotum in dorsal view simultaneously visible on whole length. Upper side black with very feeble metallic reflex or pure black. Aedeagus as in figs **1388, 1389**. Length 4.2–4.9 mm. Distributed in Italian Alps ..... **barii** BURLINI, 1948.
- . Both lateral margins of pronotum in dorsal view simultaneously visible only in middle and hind part, anterior angles covered by anterolateral convexity. Metallic sheen always distinct, usually vivid, except rare colour aberrations ..... **21**.



Figs 1382-1387. Aedeagus in dorsal and lateral view (1384, 1385 after WARCHAŁOWSKI 1991, remaining after SASSI 2000): 1382, 1383 – *Cryptocephalus (Cryptocephalus) violaceus*; 1384, 1385 – *C. (C.) concolor*; 1386, 1387 – *C. (C.) duplicatus*.

21. In male anterior border of anal sternite with a pair of little lamellae. General view as in plate XXXII, **phot. 287**. Upper side strongly and densely punctate, coloured as in *aureolus* (thesis 22), but elytra always unicolorous. Aedeagus as in figs **1390**, **1391**. Length 5.8–7.9 mm (= *robustus* SUFFRIAN, 1853, *bidens* THOMSON, 1868, nec SUFFRIAN, 1871). About eleven colour aberration were described. The most important variations: upper side green (typical form), upper side golden (ab. *pratorum* SUFFRIAN, 1847), upper side blue (ab. *coeruleus* WEISE, 1882), upper side purplish or violaceous (ab. *purpurascens* REITTER, 1912), upper side black, matt (ab. *funebri* BURLINI, 1962), pronotum blue, elytra green (ab. *bicolor* DEPOLI, 1926). Represented by three subspecies: in male last abdominal sternite with little impression covering posterior part only; on anterior margin without tubercles (subsp. *zambanellus* MARSEUL, 1875, = *mozambanellus* WEISE 1906, from Italy), in male last abdominal sternite with extended impression covering his whole length; anterior margin with a bidentate lamella in the middle (*sericeus* s. str.), in male the mentioned impression extended, anterior margin without lamella, sometimes with two little tubercles only (subsp. *intrusus* WEISE, 1882 from northern Italy). Distributed from northern Spain, Belgium and Denmark to north-western China ..... **sericeus** (LINNAEUS, 1758).
- In male anterior border without a pair of lamellae ..... **22**.



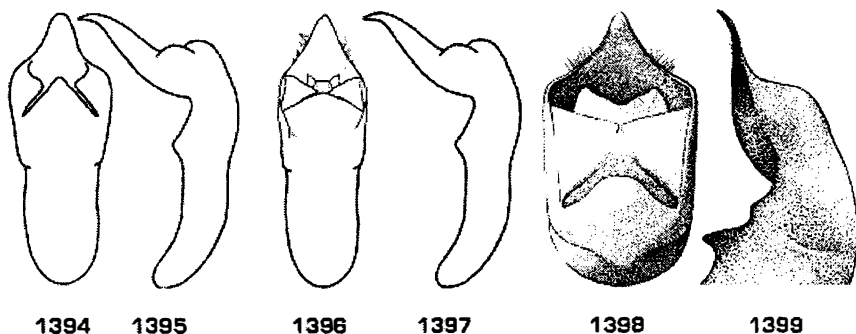
Figs 1388-1393. Aedeagus or its apical part in dorsal and lateral view (1388, 1389 after BURLINI 1955; 1390, 1391 after WARCHAŁOWSKI 1991; 1392, 1393 after PETITPIERRE 2000): 1388, 1389 – *Cryptocephalus (Cryptocephalus) barii*; 1390, 1391 – *C. (C.) sericeus*; 1392, 1393 – *C. (C.) globicollis*.

22. Body length over 5.8 mm ..... **23**.
- Body length under 5.6 mm. Here nine species very similar to each other, distinguishable by the structure of aedeagus only, not long ago considered partly as subspecies of *hypochoeridis* (thesis 27) ..... **26**.
23. Pronotum strongly convex, in anterior angles with several erect hairs ..... **24**.
- Pronotum not particularly strongly convex, in anterior angles with normal seta only, without erect hairs, secondary punctures on interstices usually distinct ..... **25**.
24. Pronotum finely punctate, in his central part interstices 3–5 times broader than diameter of punctures. General view as in plate XXXII, **phot. 288**. In male last

abdominal sternite with very shallow almost flat impression. Upper side green or bronzy green with metallic sheen. Aedeagus as in figs 1392, 1393. Length 6.0–7.0 mm (= *cyaneomicans* HEYDEN, 1891, *castilianus* WEISE, 1894). Variations: upper side green with purplish or violaceous reflex (ab. *purpureomicans* HEYDEN, 1891, *spectabilis* TIBERGHEN, 1971), upper side golden-purplish (ab. *purpureomicans* PIC, 1900, *auranthiacus* TIBERGHEN, 1971), pronotum green, elytra purplish (ab. *semipurpureus* PIC, 1914), upper side dark blue (ab. *simulatus* BURLINI, 1958). Distributed in southern France, Italy and Iberian Peninsula .....

..... *globoicollis* SUFFRIAN, 1847.

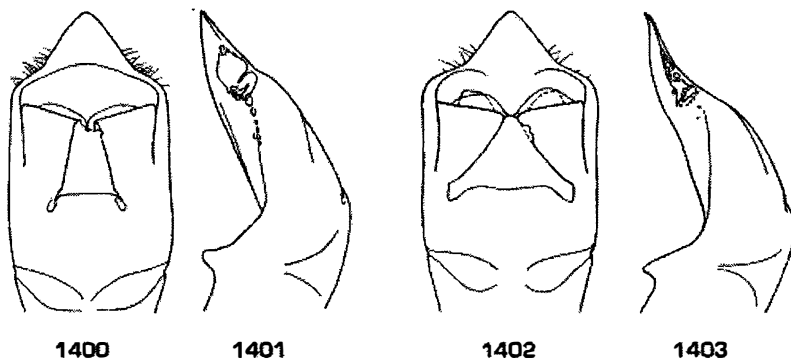
- Pronotum moderately strongly punctate. Here some forms of *globoicollis* (thesis 20), described as *castilianus* WEISE.
- 25. Operculum anteriorly elongate, forming a long, sharpened triangle (figs 1394, 1395). On pronotum secondary punctures of interstices usually indistinct or absent. In male last abdominal sternite on anterior margin without ridges or tubercles. Upper side always with metallic gloss, in typical form green, bronzy green or bluish green. Aedeagus as in figs 798, 799. Length 5.8–6.9 mm (male) to 6.5–7.8 mm (female). Variations: pronotum golden, elytra green (ab. *discolor* GERHARDT, 1909), pronotum golden-green, elytra blue (ab. *aureicollis* DEPOLI, 1940), upper side golden-green, along each elytron blue stripe (ab. *coeruleocinctus* DEPOLI et GOIDANICH, 1926), pronotum greenish-blue, elytra blue with green margins and suture (ab. *lydiae* DEPOLI, 1926), upper side dark blue (ab. *coerulescens* SCHILSKY, 1888), upperside purply-violaceous (ab. *purpureus* CSIKI, 1953). Occurs as a few subspecies: characters as above (*aureolus* s. str.), body on average shorter (subsp. *monticola* BREIT, 1918 from Italy), in male last abdominal sternite with a shallow impression, remaining characters as in nominotypical form (subsp. *illyricus* FRANZ, 1949 from Slovenia), body short and broad, pronotum very convex and finely punctate (subsp. *transcaucasicus* JACOBSON, 1898 from Georgia). Distributed from Spain and Great Britain to Russia, Caucasian countries and Central Asia ..... *aureolus* SUFFRIAN, 1847.
- Operculum anteriorly not elongate. Aedeagus as in figs 814, 815. Distributed in Asia Minor ..... *paphlagonius* SASSI et KISMALI, 2000.



Figs 1394–1399. Aedeagus or its apical part in dorsal and lateral view (1394, 1395 after WARCHALOWSKI 1991; 1396, 1397 after SASSI and KISMALI 2000 modified; 1398, 1399 after PETITPIERRE 2000): 1394, 1395 – *Cryptocephalus (Cryptocephalus) aureolus*; 1396, 1397 – *C. (C.) paphlagonius*; 1398, 1399 – *C. (C.) cantabricus*.

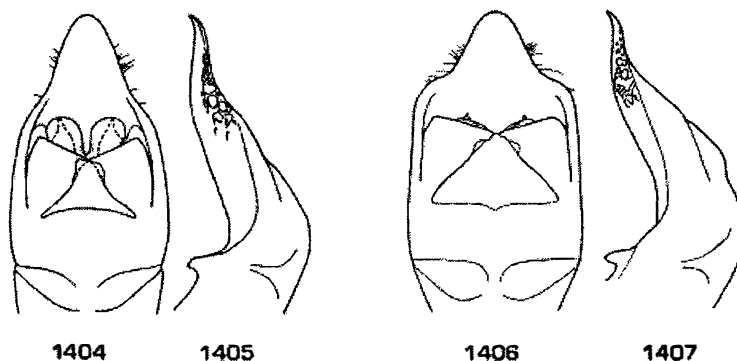


26. Tube of aedeagus slightly broader than long, almost right-angled distally, widely and deeply hollowed in ventral aspect. Apex of aedeagus as in figs **1398**, **1399**. Length of body 4.5–5.5 mm. Distributed in Spain excluding Pyrenees ..... **cantabricus** FRANZ, 1958.
- . Tube of aedeagus less broad than long, with fore angles clearly obtuse, in ventral aspect not hollowed or with a badly limited shallow impression variable in shape and largeness. Apex of aedeagus never completely devoid of hairy plates ..... **27**.



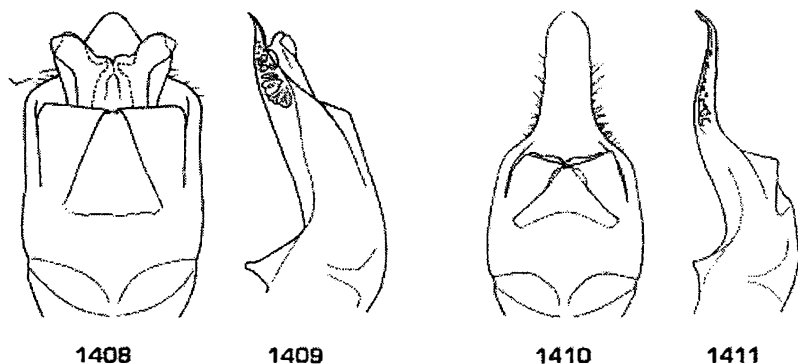
Figs 1400-1403. Apical half of aedeagus in dorsal and lateral view (after LEONARDI and SASSI 2001): 1400, 1401 – *Cryptocephalus (Cryptocephalus) praticola*; 1402, 1403 – *C. (C.) therondi*.

27. Apex of aedeagus not sinuated in lateral view (figs **1400**, **1401**), Ventral surface of aedeagal tube with sharp median carina. Length about 5.0 mm (= *laetior* ROUBAL, 1911, *ruguliventris* FRANZ, 1949). Distributed in Caucasian countries, NE Turkey, S Russia, and in European part of basin of Black Sea ..... **praticola** WEISE, 1889.
- . Apex of aedeagus more or less noticeably sinuated in lateral view. Ventral surface of aedeagal tube without sharp median carina ..... **28**.



Figs 1404-1407. Apical half of aedeagus in dorsal and lateral view (after LEONARDI and SASSI 2001): 1404, 1405 – *Cryptocephalus (Cryptocephalus) solivagus*; 1406, 1407 – *C. (C.) hypochaeridis*.

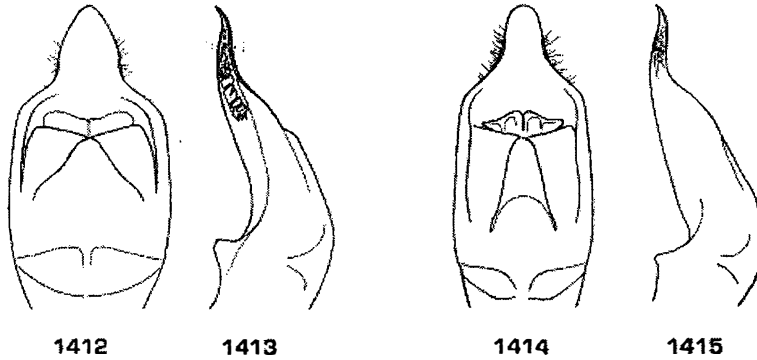
28. Ventral surface of aedeagus with apicolateral hairy plates visible both on tube and on sides of apex; base of apex as a rule at least 0.5 times as wide as tube ..... 29.
- . Ventral surface of aedeagus with apicolateral hairy plates visible at most on tube base of apex as a rule less than 0.5 times as wide as tube ..... 32.



Figs 1408-1411. Apical half of aedeagus in dorsal and lateral view (after LEONARDI and SASSI 2001): 1408, 1409 – *Cryptocephalus (Cryptocephalus) cristula*; 1410, 1411 – *C. (C.) falzonii*.

29. Apex of aedeagus as a rule without longitudinal impression on dorsal side and with hairy plates mostly reduced, hardly visible in ventral view (figs 1402, 1403). Known from S France only ..... **therondi** FRANZ, 1949.
- . Apex of aedeagus very often with a longitudinal median impression and with hairy plates usually wider, quite visible in ventral aspect ..... 30.
30. Tube of aedeagus usually narrower, its fore angles very obtuse (figs 1404, 1405). Length 4.6–5.3 mm. Distributed from Balkans, Hungary and basin of Vistula to Transcaspia, W Siberia and Altai ..... **solivagus** LEONARDI et SASSI, 2001.
- . Tube of aedeagus not narrowed, its fore angles well-marked ..... 31.
31. Apex of aedeagus in dorsal view semielliptical, rather broadly rounded (figs 1406, 1407) with median longitudinal impression very rarely lacking, though sometimes very weak. Length 4.2–5.1 mm. Distributed from Atlantic coast of France and Great Britain to Fennoscandia, basin of Vistula, Slovakia and Croatia ..... **hypochaeridis** (LINNAEUS, 1758).
- . Apex of aedeagus in dorsal view more triangular (figs 1408, 1409), with longitudinal impression not rarely lacking. Length 4.3–5.3 mm (= *cristatus* SUFFRIAN, 1849). Distributed in Pyrenees and Cordillera Cantabrica ..... **cristula** DUFOUR, 1843.
32. Apex of aedeagus (figs 1410, 1411) as a rule subparallelsided, almost as long as tube and with a weak semilunar swelling on distal end, visible both in ventral and lateral view. Distributed in Calabria and Sicily ..... **falzonii** BURLINI, 1956.
- . Apex of aedeagus subtriangular, much shorter than tube and without semilunar swelling on distal end ..... 33.
33. Tube of aedeagus comparatively short (usually less than 1.20 times as long as wide), almost never completely devoid of hairy plates on ventral surface (figs 1412, 1413)

- Apex of aedeagus comparatively large, as a rule almost parallelsided in basal 1/4, with median impression rarely lacking, often extended to distal part of tube. Length 4.3–5.4 mm. Distributed in Central Europe from Hungary to East Germany, Western part of Balkan peninsula, Alps and Po valley ..... **transiens** FRANZ, 1949.
- Tube of aedeagus comparatively elongate (usually more than 1.20 times as long as wide), completely devoid of hairy plates on ventral surface (figs **1414**, **1415**). Distributed in Apennines, from Liguria to Lucania ..... **samniticus** LEONARDI et SASSI, 2001.



Figs 1412-1415. Apical half of aedeagus in dorsal and lateral view (after LEONARDI and SASSI 2001): 1412, 1413 – *Cryptocephalus (Cryptocephalus) transiens*; 1414, 1415 – *C. (C.) samniticus*.

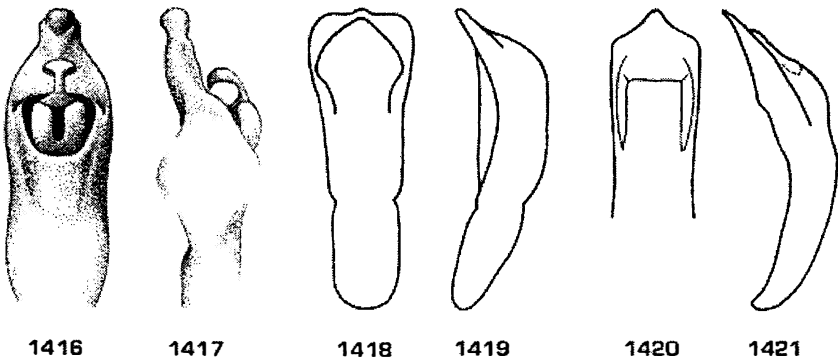
### Auxiliary group C

Upper side partly black with metallic sheen.

#### Key to species

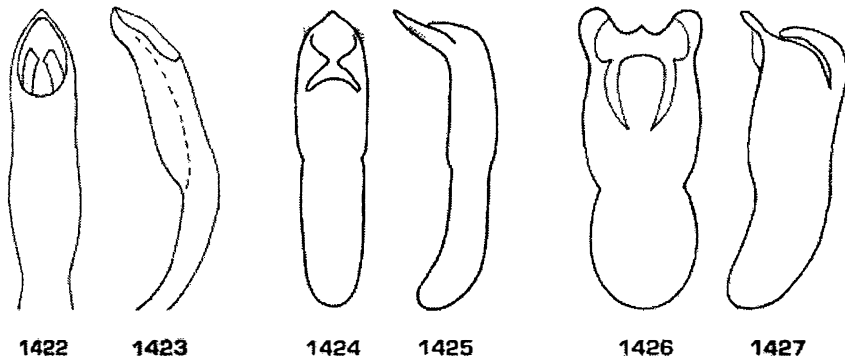
1. Primary puncturation of elytra arranged in regular, longitudinal rows ..... **2**.
- Primary puncturation of elytra random or at most here and there arranged in semiregular rows ..... **6**.
2. Length of body 2.0–2.3 mm. Aedeagus as in figs **1422**, **1423**. Species externally resembles representatives of subgenus *Burlinius* (somewhat similar to *C. (B.) pygmaeus vittula*, see subgen. *Burlinius*, auxiliary group B, antithesis 25), but differing in shape of aedeagus. Described from Arabian Peninsula ..... **buettikeri** LOPATIN, 1979.
- Length of body always over 3.0 mm ..... **3**.
3. Head, pronotum and disc of elytra green or blue with strong metallic sheen. General view as in plate XXXIII, **phot. 289**. Clypeus blue. Genae, lateral margins of pronotum alike lateral margins and apex of elytra yellow. Pronotum thickly but shallowly punctate, punctures of elytra strong, intervals transversely rugose. Aedeagus as in figs **1416**, **1417**. Length 4.0–5.0 mm. Variation: pronotum bronzy, disc of elytra

- violaceous, yellow pattern as in typical form (ab. *pulcher* BURLINI, 1967). Distributed in southern France and in Iberian Peninsula..... ***ramburii*** SUFFRIAN, 1847.
- . Colouration of body different ..... 4
4. Pronotum strongly punctate. General view as in plate XXXIII, **phot. 290**. Upper side dark blue or black-blue with greenish reflex. In male genae, clypeus, a great part of frons and anterior margin of pronotum yellow. In female this pattern reduced, usually only genae, clypeus and two little spots on frons yellow. Aedeagus as in figs **1418, 1419**. Length 3.0–4.4 mm (= *megaloderus* FALDERMANN, 1830, *megalosomus* FALDERMANN, 1837, *rusticus* FALDERMANN, 1837, *convexissimus* PIC, 1908, *insulcaticeps* PIC, 1911, *weymarni* GRESSIT et KIMOTO, 1961). Variations: yellow pattern variously reduced (a few unnamed aberrations), upper side black with yellow pattern on head only (ab. *melanarius* BURLINI, 1967), upper side black, broadly bluish margined (ab. *satanas* KASZAB, 1962). Distributed in France, Italy, Central Europa, Romania, Bulgaria, Ukraine, southern Russia and in Caucasian countries ..... ***janthinus*** GERMAR, 1824.
- . Pronotum finely punctate ..... 5
5. Pronotum finely and and sparcely punctate, in central part of surface interstices 4-5 times broader than diameter of punctures. Upper side dark blue, genae and clypeus (sometimes partly) pale yellow. On each elytron one or two yellowish spots. Here some aberrations of *androgynae* (see group B, thesis 6).
- . Pronotum finely but not sparcely punctate, in central part of surface interstices 1-2 times broader than diameter of punctures. General view as in plate XXXIV, **phot. 299**. Upper side black with relatively feeble, blue or violaceous metallic reflex. On each elytron a yellowish or reddish preapical spot. Aedeagus as in figs **1420, 1421**. Length 4.2–5.0 mm (= *rufilabris* SUFFRIAN, 1853). Distributed in Crimea, reported also from „southern Russia“ ..... ***biguttulus*** SUFFRIAN, 1848.
6. In male mid and hind tibia in distal part with a crest. Here some colour aberrations of *tibialis* (auxiliary group B, thesis 14).
- . In male mid and hind tibia without crest ..... 7.



Figs 1416-1421. Aedeagus or its apical part in dorsal and lateral view (1416, 1417 after PETITPIERRE 2000; 1418, 1419 after WARCHALOWSKI 1991; 1420, 1421 after LOPATIN and DOVGAILO 2002): 1416, 1417 – *Cryptocephalus (Cryptocephalus) ramburii*; 1418, 1419 – *C. (C.) janthinus*; 1420, 1421 – *C. (C.) biguttulus*.

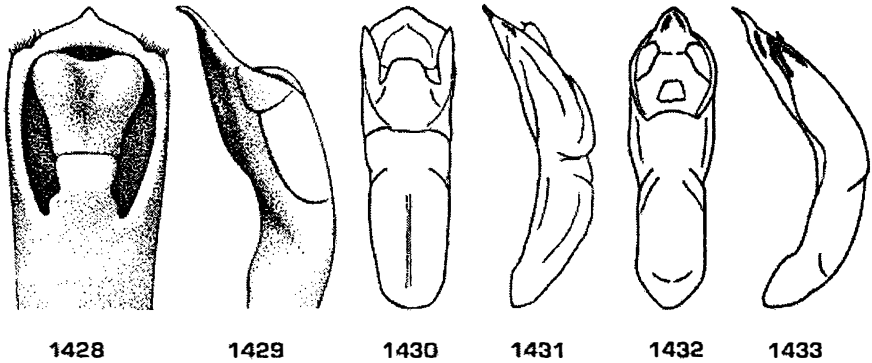
7. Ground colour of elytra yellow or reddish with black pattern ..... **8.**  
 -. Ground colour of elytra black with metallic lustre, unicolorous or with yellow pattern ..... **11.**  
 8. Pronotum dark green with bronzy or golden lustre, his lateral margin yellow. General view as in plate XXXIII, **phot. 291.** Elytra yellow, in anterior part normally with two little black spots and with a transverse black, often interrupted stripe in posterior part. Aedeagus as in figs **1424, 1425.** Length 4.1–4.9 mm (= *salisburgensis* MOLL, 1784, *mixtus* SCHNEIDER, 1792, *steveni* ADAMS, 1817). Variations: on elytra humeral spot only (ab. *micronotatus* PIC, 1908), prescutellar spot absent, postmedian stripe interrupted (ab. *balatonicus* KASZAB, 1962), prescutellar spot absent, postmedian stripe entire (ab. *innotatus* CSIKI, 1953), prescutellar spot present, postmedian stripe entire (typical form), prescutellar spot present, postmedian stripe interrupted (ab. *octosignatus* KASZAB, 1962), prescutellar and humeral spots fused (ab. *bifasciatus* KASZAB, 1962). Distributed in basin of Danube, Poland, Romania, Ukraine, southern Russia and Caucasian countries ..... **laetus** FABRICIUS, 1792.  
 -. Colouration of upper side different ..... **9.**



Figs 1422-1427. Aedeagus in dorsal and lateral view (1422, 1423 after LOPATIN 1979; 1424, 1425 after WARCHAŁOWSKI 1991; 1426, 1427 after WARCHAŁOWSKI 2003): 1422, 1423 – *Cryptocephalus (Cryptocephalus) buettikeri*; 1424, 1425 – *C. (C.) laetus*; 1426, 1427 – *C. (C.) perrisi*.

9. Length of body about 5.0 mm. Pronotum finely punctured. Elytra red, with humeral calli and, in typical form, a great, anchor-like pattern black. Legs and underside black. Aedeagus not studied. Variation: on each elytron two black spots (ab. *pseudobaeticus* BURLINI, 1958). Occurs in Morocco ..... **telueticus** ESCALERA, 1914.  
 -. Length of body above 6.0 mm ..... **10.**  
 10. On pronotum blue metallic sheen distinct, punctures longitudinally extended, forming shining longitudinal ridges. General view as in plate XXXIII, **phot. 292.** Elytra reddish, normally with five (2, 2, 1) black spots, sometimes extended and fused into irregular pattern covering a great part of elytra. Aedeagus as in figs **1426, 1427.** Length 6.4–7.7 mm. Variations: elytron with five spots (ab. *jurjurenensis* PIC, 1900),

- black spots fused (typical form = ab. *warioni* PIC, 1909), black spots partly absent (ab. *depictus* WEISE, 1891). Distributed in Morocco and Algeria ..... *perrisi* TAPPES, 1869.
- . On pronotum metallic reflex very feeble, bronzy, usually absent, punctures a little extended, longitudinal rugosities rather indistinct. General view as in plate XXXIII, **phot. 293**. Elytra reddish with five (2, 2, 1) black spots. Aedeagus as in figs **1428**, **1429**. Length 6.3–7.2 mm. Variations: black spots partly absent (ab. *depictus* WEISE, 1891), three posterior spots fused into a curved stripe (ab. *santanderi* BURLINI, 1955). Distributed in Iberian Peninsula and southern France, reported also from Algeria ... *pexicollis* SUFFRIAN, 1847.
11. Elytra unicolorous ..... **12**.
- . Elytra with pale margin (at least partly) or/and with pale spots ..... **14**.
12. Pronotum distinctly, rather deeply, moderately strongly punctate, with lateral (in male also anterior) margin narrowly pale. Upper side dark blue-black. Pronotum very shallowly and weakly punctate, its lateral margin narrowly yellow, in male also anterior margin usually very narrowly reddish or yellowish. Coxae, femora at base and upper side of fore tibiae pale. General view as in plate XXXIII, **phot. 294**. Length 4.0–5.3 mm (= *angustelimbatus* REITTER, 1912, *kraatzi* CHŪJŌ, 1935, *approximans* CHEN, 1942). Distributed in Siberia from Tuva to basin of Ussuri, Mongolia, N China and Korea ..... *coerulans* MARSEUL, 1875.
- . Pronotum smooth, very finely and sparsely punctate, often almost impunctate ... **13**.



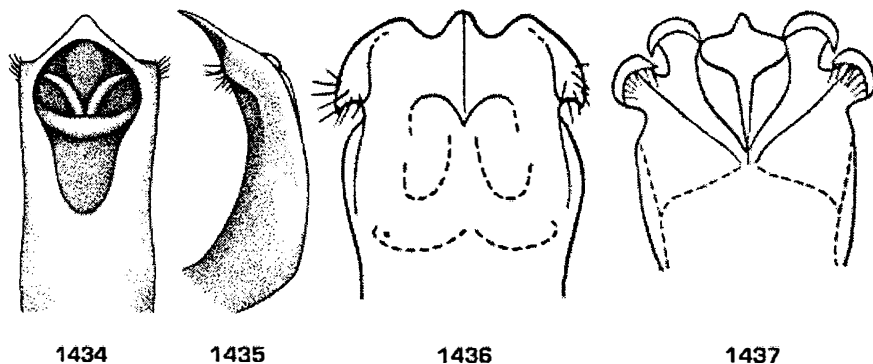
Figs 1428–1433. Aedeagus in dorsal and lateral view (1428, 1429 after PETITPIERRE 2000, remaining after TAKIZAWA 1975): 1428, 1429 – *Cryptocephalus (Cryptocephalus) pexicollis*; 1430, 1431 – *C. (C.) nitidulus*; 1432, 1433 – *C. (C.) nitidus*.

13. Frons with a great, yellowish, heart-shaped spot, joined with pale clypeus. Upper side dark bluish-green or dark green with bronzy reflex. General view as in plate XXXIII, **phot. 295**. Elytra strongly and unevenly punctured. Pale coloured (orange) are: legs, clypeus and a heart-shaped spot on frons, posterior angles and anterior margin of pronotum (in male only). Aedeagus as in figs **1430**, **1431**. Length 3.5–4.5 mm (= *ochrostoma* HAROLD, 1872, *borealis* MEDVEDEV, 1966). Variations: metallic sheen

of upper side purplish or violaceous (unnamed), metallic sheen particularly vivid, on head and pronotum golden or golden-purplish, on elytra green or bluish-green (ab. *splendidulus* CSIKI, 1953), in male upper side blue, on pronotum anterior stripe in the middle broadly interrupted (ab. *stigmula* BURLINI, 1955), in male not only anterior, but also lateral margins narrowly yellowish (ab. *perfectecinctus* BURLINI, 1962). Distributed mainly in central and northern part of Europe .....

..... ***nitidulus*** FABRICIUS, 1787.

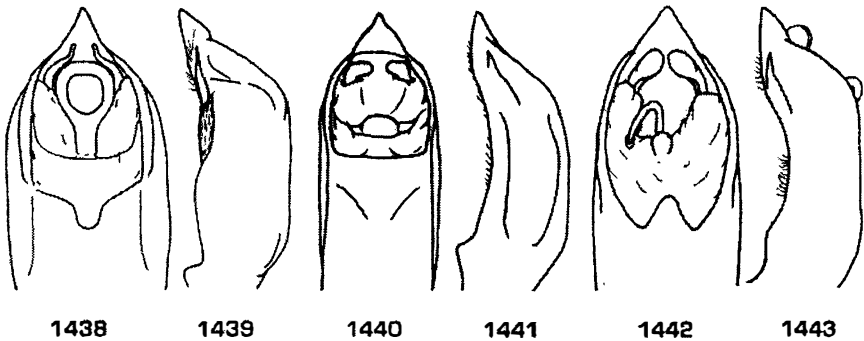
- Frons black, sometimes with a small, elongate yellow spot at inner side of each eye. Upper side bluish-black. Frons black or with two little yellowish spots near eyes. General view as in plate XXXIII, **phot. 296**. Elytra moderately strongly punctured. In male fore legs reddish with a black stripe on dorsal side of femora, mid and hind legs brown or blackish. In female legs entirely pale yellow, sometimes with darkened basal part of femora. Aedeagus as in figs **1432**, **1433**. Length 3.9–5.2 mm (= *nitens* LINNAEUS, 1761, *flavifrons* FABRICIUS, 1792, *romanus* WEISE, 1900). Distributed in Europa from northern Spain, Belgium and southern Norway to southern Finland and basin of Volga .....
- ..... ***nitidus*** (LINNAEUS, 1758).
- 14. Elytra greenish-aeneous with lateral margins and apex yellowish. Pronotum impunctate, with two large greenish patches. Legs pale with darkened tarsi and outer margin of tibiae. Underside metallic with reddish or brownish reflex, apex of pygidium pale. Puncturation of elytra dense, arranged in irregular rows. Length 4.5–5.0 mm. Described from N China (Shansi) .....
- ..... ***shansiensis*** CHEN, 1942.
- Elytra differently coloured .....
- ..... **15.**



Figs 1434-1437. Apical part of aedeagus in dorsal and lateral view (1433, 1434 after PETITPIERRE 2000, remaining after MEDVEDEV 1982): 1434, 1435 – *Cryptocephalus (Cryptocephalus) tetraspilus*; 1436 – *C. (C.) ochroloma*; 1437 – *C. (C.) biguttulatus*.

- 15. Each elytron with two (subhumeral and preapical) orange spots, but without narrow marginal stripe. Punctures on pronotum moderately strong, a little elongate ..... **17.**
- Each elytron with two or one (subhumeral and apical or apical only) pale spots or stripes, also lateral margins of pronotum and elytra usually partly or entirely narrowly pale. Here a group of five species. The great similarity of external chara-

- cters allows neither for its application in diagnosis, nor assembling into a key. The base for determination is shape of aedeagus, but subtle differences of details also do not allow introduction of dichotomic division. In the present key only pictures of aedeagi borrowed from SASSI (2001) were cited ..... 19.
16. An European species, length of body 3.5–4.5 mm. General view as in plate XXXIII, **phot. 297**. Aedeagus as in figs **1434, 1435** (= *lepidus* MULSANT, 1852). Variations: elytron with an additional little orange spot between humerus and scutellum (ab. *bensai* BURLINI, 1955), humeral spot strongly reduced or absent (ab. *fongondi* BURLINI, 1955). Distributed in Iberian Peninsula, Italy and southern France ..... *tetraspilus* SUFFRIAN, 1851.
- . A North-African species, length of body about 5.0 mm (= *vaucheri* PIC, 1950). Aedeagus not studied. Colouration as in *tetraspilus*. Variations: orange pattern extended, black ground reduced to two transverse stripes (unnamed), orange pattern reduced to subhumeral stripe (ab. *malhommei* KOCHER, 1958). Occurs in Morocco ... *azurescens* ESCALERA, 1914.
17. Body, underside, legs and antennae black, upper side black with weak bluish reflex. Lateral margins of pronotum, lateral and apical margins of elytra pale yellow, hind part of sutural margin and longitudinal stripe running parallel to suture in posterior 1/3 of elytra also pale yellow. General view as in plate XXXIV, **phot. 298**. Aedeagus as in fig. **1436**. Length 6.0–7.0 mm. Distributed from Altai and Mongolia to basin of Ussuri, Magadan Province and NE China ..... *ochroloma* GEBLER, 1830.
- . Not as above ..... 18.

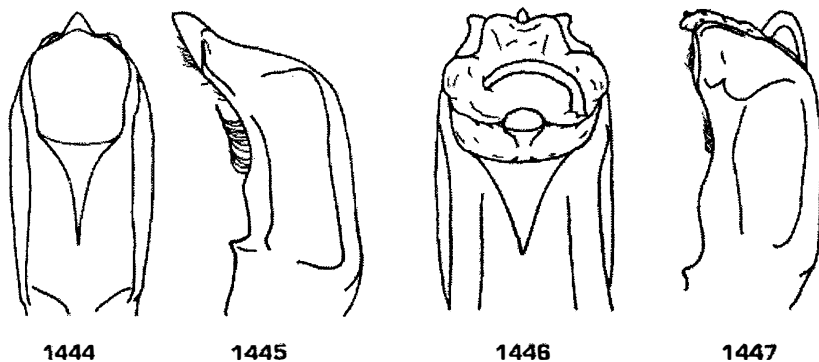


Figs 1438–1443. Apical half of aedeagus in dorsal and lateral view (after SASSI 2001): 1438, 1439 – *Cryptocephalus (Cryptocephalus) renatae*; 1440, 1441 – *C. (C.) marginellus*; 1442, 1443 – *C. (C.) zoiai*.

18. Upper side black with weak bluish metallic reflex, apical part of elytra dark yellow. Elytra somewhat rugosely punctured. Antennae and legs uniformly black. In male last abdominal sternite with a deep impression. Aedeagus as in fig. **1437**. General view as in plate XXXIV, **phot. 299**. Length 5.2–6.5 mm. Distributed in Mongolia and in E Siberia from Tuva to Magadan Province ..... *biguttulatus* GEBLER, 1841.
- . Elytra entirely metallic with pale lateral margin only ..... 19.



19. Head and legs entirely pale. Upper side green, sometimes blue-green or blue, metallic sheen vivid. Lateral (in male usually also anterior) margins of pronotum and anterior half of elytral margins yellow. General view as in plate XXXIV, **phot. 300**. Length 3.5–4.6 mm. Distributed in Mongolia, Transbaikalia and N China ..... *eous* LOPATIN, 1952.
- On frons two or three dark spots, on upper side of femora often narrow dark stripe, tarsi usually darkened. Upper side coloured as in *eous* (thesis 19). General view as in plate XXXIV, **phot. 301**. Length 3.9–5.5 mm. Distributed in E Siberia, Mongolia and N China ..... *kulibini* GEBLER, 1832.
20. Apical part of aedeagus gently narrowed and sharpened ..... **21**.
- Apical part of aedeagus shortly cut, aemiobtuse, with lamella ..... **23**.
21. Subhumeral stripe narrow, very pale, white cream, apical spot orange. Here two species externally very similar to each other, differing by fine structure details of aedeagus ..... **22**.
- Pale pattern on elytra usually expanded, sometimes covering the whole surface. Aedeagus as in figs **1438, 1439**. Length 3.8–3.9 mm (male) to 4.2–4.4 mm (female). Distributed in Italy (Liguria, Lombardia and Piemonte) ..... *renatae* SASSI, 2001.



Figs 1444-1447. Apical half of aedeagus in dorsal and lateral view (after SASSI 2001): 1444, 1445 – *Cryptocephalus (Cryptocephalus) eridani*; 1446, 1447 – *C. (C.) aquitanus*.

22. Aedeagus as in figs **1440, 1441**. General view as in plate XXXIV, **phot. 302**. Pronotum black or black blue with pale yellow margins. Ground colour of elytra black or black blue. In male fore legs yellow, mid and hind legs darkened, in female all legs yellow. Length 3.5–4.1 mm. Variations: on elytron subhumeral stripe absent, apical spot reduced (ab. *romanus* WEISE, 1900), subhumeral stripe normal, apical spot considerably reduced (ab. *andorreensis* BURLINI, 1955), subhumeral stripe extended, reaching to 1/3 of breadth of elytron (ab. *savonae* BURLINI, 1948), elytra yellowish with black humeral spot only (ab. *inexpectus* FAIRMAIRE, 1861), subhumeral stripe joined with apical spot (ab. *pictus* RAGUSA, 1882). One subspecies was described from Sicily: pale pattern on elytra stronger developed, body robuster, punctures more regularly scattered (subsp. *sicilianus* CLAVAREAU, 1913, = ?*ragusanus* ROUBAL, 1912).

- Distributed in northern Spain, southern France, western Alps and in whole Italy with Sicily ..... *marginellus* OLIVIER, 1791.
- Aedeagus as in figs **1442**, **1443**. Length 3.6–3.8 mm (male) to 4.2–4.4 mm (female). Distributed in Italy (Liguria, Piemonte) and in France (Alpes Maritimes) ..... *zoiai* SASSI, 2001.
23. Aedeagus as in figs **1444**, **1445**. Length 3.9–4.1 mm (male) to 4.4–4.6 mm (female). Distributed in NW Italy ..... *eridani* SASSI, 2001.
- Aedeagus as in figs **1446**, **1447**. Length 3.7–3.9 mm (male) to 4.3–4.6 mm (female). Distributed in Massif Central (France) and in Pyrenees ..... *aquitanus* SASSI, 2001.

#### Auxiliary group D

Upper side entirely black without metallic reflex.

#### Key to species

1. Length of body under 3.5 mm. Pronotum without punctures, glassy. Pure black forms of *modestus* (see group B, thesis 9).
- Length of body at least 3.5 mm. Pronotum punctate ..... 2.
2. Upper side strongly (on elytra coarsely) punctured. Length 4.0–5.2 mm. Aedeagus as in figs **1448**, **1449**. Distributed in E Siberia from Baikal region to Yakutia and Magadan Province and basin of Amur ..... *ruralis* WEISE, 1887.
- At most elytra strongly punctured, puncturation of pronotum fine or moderately strong ..... 3.
3. Lateral margin of pronotum widened and flattened (in posterior part stronger) on whole length ..... 4.
- Lateral margin of pronotum widened and flattened on a short fragment in posterior part only ..... 6.
4. Both lateral margins of pronotum in dorsal view simultaneously visible on whole length. Length 4.2–4.9 mm. Pure black form of *barii* (group B, thesis 20).
- Both lateral margins of pronotum in dorsal view simultaneously visible only in middle and hind part, anterior angles covered by anterolateral convexity ..... 5.
5. Body larger, length over 5.5 mm. Puncturation of elytra rather strong, random, pronotum distinctly, moderately strongly punctate. Head without pale pattern. Here rare pure black forms of *sericeus* (group B, thesis 21).
- Body smaller, length 4.8–5.0 mm. Puncturation of elytra arranged in semiregular rows, pronotum smooth, almost impunctate. Head with a dark yellow spot between eyes. From very similar *signatifrons* (auxiliary group F, thesis 4) differs by uniformly black legs. Aedeagus not studied (= *aethiops* WEISE, 1889, nec WEISE, 1882). Distributed in E China (Shansi, Shantung) ..... *securus* WEISE, 1913.
6. Pronotum laterally strongly convex, both lateral margins in dorsal view simultaneously visible only in hind part. In male last abdominal sternite with a short transverse ridge. Pure black forms of *violaceus* (group B, thesis 15).
- Pronotum laterally less convex, both lateral margins in dorsal view simultaneously visible on whole or on almost whole length. In male last abdominal sternite without a short transverse ridge ..... 7.

- 7. Pronotum laterally somewhat constricted, both lateral margins in dorsal view simultaneously visible on whole length. Surface of pronotum relatively strongly and deeply punctate, interstices shining, secondary punctures here and there present, but rather indistinct. Length 4.5–5.2 mm. Pure black form of *asturiensis* (group B, thesis 13).
- Pronotum not constricted, both lateral margins in dorsal view simultaneously visible almost on whole length (without anterior angles) ..... **8**.
- 8. Length 4.2–5.0 mm, species from Alps and Balkan Peninsula: pure black forms of *leonhardi* (group B, antithesis 13).
- Length 3.7–4.6 mm, species known mainly from Middle Europe: a rare variation of *frenatus* (ab. *barbareae*, group H, antithesis 23).

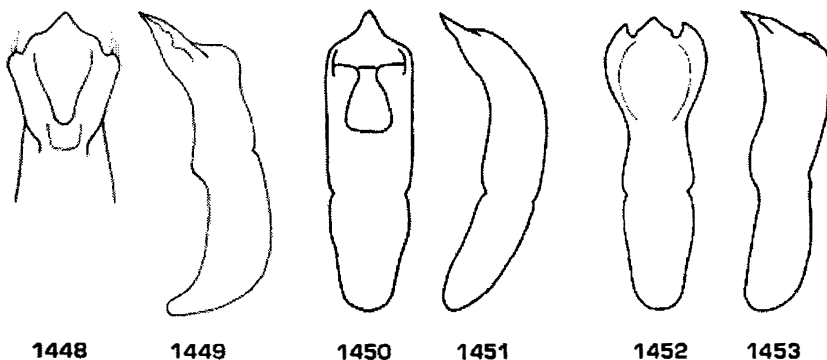
**Auxiliary group E**

Pronotum uniformly black, legs black.

Key to species

- 1. Elytra black with yellow or reddish pattern ..... **2**.
- Elytra yellow or reddish with black pattern ..... **10**.
- 2. Punctures of elytra confused. Elytron black with two (subhumeral and apical) yellowish or orange spots. In melanotic forms at least epipleuron pale ..... **3**.
- Punctures of elytra arranged in more or less regular rows. Elytron black with yellowish apical spot and sometimes a little pale spot near scutellum. Legs black ..... **4**.
- 3. Legs and pronotum in both sexes black. Lateral margin of elytron a little flattened. On pronotum primary punctures very fine, interstices covered by extremely fine but dense and distinctly visible secondary punctures. Aedeagus as in figs **1450, 1451**. Length 4.2–5.5 mm (= *nigribuccis* GEBLER, 1830, *kowarzi* GRADL, 1881, ?*corinthius* Pic, 1914). Variations: on pronotum near anterior angle a little reddish spot (ab. *nuntius* WESE, 1898), on elytron anterior spot enlarged to middle of breadth of elytron (ab. *latemaculatus* CSIKI, 1952), on elytron anterior spot reduced, epipleuron reddish only (ab. *noesskei* APFELBECK, 1912) on elytron all spots almost entirely reduced (ab. *maurus* SUFFRIAN, 1848). Distributed in basin of Danube, Romania, south-eastern Poland, Ukraine, southern Russia and Caucasian countries ..... **quadriguttatus** RICHTER, 1820.
- At least fore tibiae yellowish. Here some aberrations of *quadripustulatus* (auxiliary group I, thesis 10).
- 4. Upper side black, on each elytron a very broad longitudinal stripe, in variations sometimes divided into two spots. Here females of *marginatus* (auxiliary group B, thesis 8) and *bicolor* (auxiliary group B, antithesis 8).
- Upper side differently coloured ..... **5**.
- 5. Elytra black, with a subhumeral yellow stripe, apical spot absent. A rare melanotic aberration of *vittatus* (thesis 11).
- Apical spot present ..... **6**.
- 6. Apical spot oval ..... **7**.
- Apical spot semilunar or kidney-like ..... **9**.

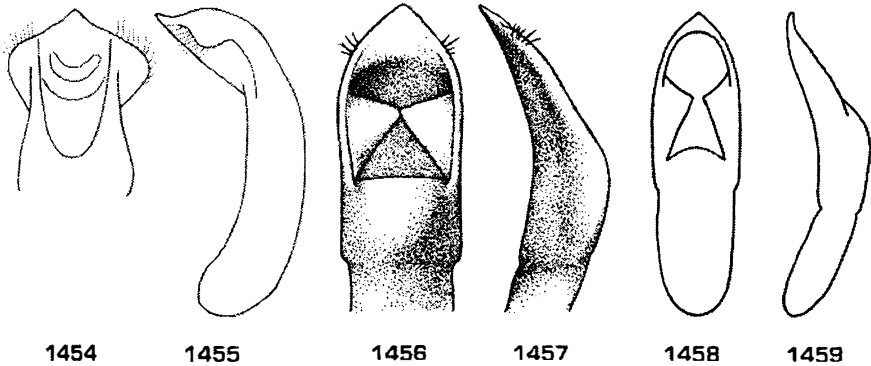
7. Legs black ..... 8.  
 - Fore legs yellow with darkened femora, mid and hind legs black. Here females of *anticus* (auxiliary group F, thesis 5).



Figs 1448-1453. Aedeagus in dorsal and lateral view (1448, 1449 after LOPATIN and DOVGAILO 2002, remaining after WARCHAŁOWSKI 1991): 1448, 1449 – *Cryptocephalus (Cryptocephalus) ruralis*; 1450, 1451 – *C. (C.) quadriguttatus*, 1452, 1453 – *C. (C.) biguttatus*.

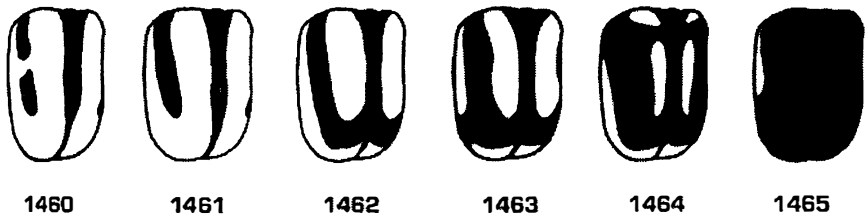
8. On elytron only apical spot present. European species. General view as in plate XXXIV, **phot. 303**. Aedeagus as in figs **1452, 1453**. Length 4.2–6.3 mm (= *bipustulatus* FABRICIUS, 1775). Variation: on elytron apart from apical spot a little pale spot near scutellum (ab. *ornatus* ROUBAL, 1909). Distributed mainly in Central Europe, from western France and Great Britain to northern Italy Romania and southern Finland ..... ***biguttatus*** (SCOPOLI, 1763).  
 - On each elytron two large dark yellowish spots. E Asian species. Primary puncturation of elytra, moderately strong, entirely random. Externally very similar to females of *nobilis* (see subgenus *Heterichnus*, thesis 16) but in *nobilis* pronotum is longer and elytral puncturation stronger, tending to form longitudinal stripes. Aedeagus as in figs **1454, 1455**. Length 5.5–6.2 mm. Distributed in E Siberia ..... ***latimargo*** MEDVEDEV, 1971.  
 9. Body larger, usually about 5.0 mm long. Pronotum almost glassy, sparsely and extremely finely punctate. Here some melanotic aberrations of *bipunctatus* (thesis 15).  
 - Body smaller, usually about 3.9 mm long. Pronotum sparsely and finely, but distinctly punctate. Aedeagus as in figs **1456, 1457**. General view as in plate XXXIV, **phot. 304**. Length 4.0–5.0 mm (= *rossii* SUFFRIAN, 1848, *centrimaculatus* SUFFRIAN, 1849 *hirtifrons* GRAELLS, 1858, *gaditanus* MARSEUL, 1875, *limbatipennis* PIC, 1909, nec JACOBY, 1885, *subancorarius* PIC, 1910, *schaeferi* PIC, 1950). Forms different colour variations, elytra now black with orange stripes (to some extent as in *floribundus*) now, more rarely, red with black dots as in plate XXVIII, **phot. 250**. Distributed in southern France and Iberian Peninsula ..... ***sexpustulatus*** (VILLERS, 1789).  
 10. Elytra yellow or reddish with black longitudinal (sutural and marginal or discal) stripes ..... **11**.  
 - Elytra yellow or reddish with black spots ..... **13**.

11. Elytron with sutural and discal stripes, usually jointed in posterior part. General view as in plate XXXIV, **phot. 305**. Epipleura yellow. Aedeagus as in figs **1458**, **1459**. Length 3.6–4.8 mm (= *digonensis* PIC, 1900, *desbrochersi* PIC, 1898, *lotharingus* PIC, 1900, *reductevittatus* PIC, 1913). Fourteen colour variations were described, the most important aberrations and their names as in figs **1460–1465**. Distributed in Iberian Peninsula, France, Middle Europa, alike in basins of Danube and Dnieper ..... **vittatus** FABRICIUS, 1775.
- . Elytron with sutural and marginal stripes. Epipleuron black ..... **12**.



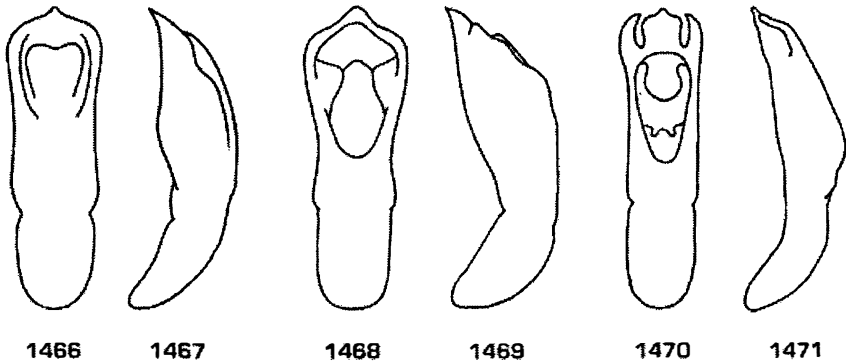
Figs 1454-1459. Aedeagus in dorsal and lateral view (1448, 1449 after LOPATIN and DOVGAILO 2002; 1456, 1457 after PETITPIERRE 2000; 1458, 1459 after WARCHALOWSKI 1991): 1454, 1455 – *Cryptocephalus (Cryptocephalus) latimargo*; 1456, 1457 – *C. (C.) sexpustulatus*, 1458, 1459 – *C. (C.) vittatus*.

12. Marginal stripe very narrow, humeral calli yellow. Rare form of *bicolor* (female) without metallic reflex on pronotum (auxiliary group B, thesis 8).
- . Marginal stripe anteriorly and in the middle widened, humeral calli black. Forms of *marginatus* without metallic reflex on pronotum (auxiliary group B, thesis 8).



Figs 1460-1465. *Cryptocephalus (Cryptocephalus) vittatus*, variations of elytral pattern (after WARCHALOWSKI 1991): 1460 – ab. *optatus* WEISE, 1898; 1461 – ab. *patens* CSIKI, 1953; 1462 – typical form; 1923; 1463 – ab. *reynosensis* PIC, 1923; 1464 – ab. *negligens* WEISE, 1882; 1465 – ab. *schrammi* PIC, 1907.

13. Pronotum finely and densely punctate, laterally punctures distinctly elongate. Each elytron normally with five (2, 2, 1) black spots. Here some forms of *pexicollis* (auxiliary group C, antithesis 10) without metallic reflex on pronotum.
- . Pronotum very finely and sparsely punctate, shining. Punctures of elytra arranged in more or less regular rows ..... 14
14. Punctures of elytra confuse, each elytron normally with five (2, 2, 1) black spots ..... 15
- . Punctures of elytra arranged in more or less regular rows, each elytron with two or three black spots ..... 16
15. Punctures of pronotum distinctly elongate, species distributed in southern France and Iberian Peninsula. Forms of *pexicollis* without metallic reflex on upper side (auxiliary group C, antithesis 10).
- . Punctures of pronotum only laterally insignificantly elongate. Aedeagus as in figs **1466, 1467**. Length 6.5–7.9 mm (= *imperialis* FABRICIUS, 1798 nec LAICHARTING, 1781, *decemmaculatus* GEOFFROY, 1785 nec LINNAEUS, 1758, *rufolimbatus* SUFFRIAN, 1847, *manueli* TAPPES, 1874, *nigroconjunctus* PIC, 1900, *guedeli* PIC, 1911, *modanensis* PIC, 1912, *grenieri* PIC, 1912). Distributed mainly in eastern France and Italy, reported also from Germany, Austria and Switzerland ..... **primarius** HAROLD, 1872.
16. Each elytron with two small black spots or uniformly reddish. See *pexicollis* (auxiliary group C, antithesis 10).
- . Each elytron with 1–3 black spots ..... 17.



Figs 1466-1471. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1991): 1466, 1467 – *Cryptocephalus (Cryptocephalus) primarius*; 1468, 1469 – *C. (C.) bipunctatus*, 1470, 1471 – *C. (C.) trimaculatus*.

17. Each elytron normally with two (1, 1) black spots. General view as in plate XXXIV, **phot. 306**. Aedeagus as in figs **1468, 1469**. Length 4.2–6.1 mm (= *sanguinolentus* SCOPOLI, 1763, *lineola* FABRICIUS, 1792, *dispar* PAYKULL, 1799, *quadrinotatus* HERRICH-SCHÄFFER, 1838, *paradoxus* SUFFRIAN, 1848, *thomsoni* WEISE, 1881, *clericus* SEIDLITZ, 1891, *immaculatipennis* PIC, 1900, *intemeratus* GOZIS, 1907, *agnani* PIC, 1908, *nebulosonotatus* PIC, 1911, *subimmaculatus* PIC, 1900). In variations black spots

- extended, in darkest forms elytra are black with reddish spot on apex. Transpalearctic species, very widely distributed from Portugal and Ireland to Korea. In eastern part of Asia predominate form without median spots on elytra, ranked usually as subsp. *cautus* WEISE, 1893 ..... **bipunctatus** (LINNAEUS, 1758).
- Each elytron normally with three (1, 2) black spots ..... **18**.
18. Lateral ridge of pronotum very narrow. General view as in plate XXXV, **phot. 307**. Aedeagus as in figs **1470, 1471**. Length 5.2–6.3 mm (male) to 6.2–7.6 mm (female) (= *salicis* FABRICIUS, 1792). Variation: both posterior spots fused (ab. *posticefasciatus* PIC, 1900). Distributed in southern part of Europe from southern France and Italy to Hungary, Balkan Peninsula, Asia Minor and Near East ..... **trimaculatus** ROSSI, 1790.
- Lateral ridge broader and a little flattened. General view as in plate XXXV, **phot. 308**. Aedeagus as in figs **1472, 1473**. Length 5.0–6.8 mm (= *bistripunctatus* GERMAR, 1824). Variations: external spot in posterior part of elytron absent (ab. *inexternus* PIC, 1910), both posterior spots fused (ab. *posticeinstitutus* PIC, 1900). Distributed in northern Spain, France, southern Germany, basin of Danube, Balkan Peninsula, Romania, Ukraine and Asia Minor ..... **imperialis** LAICHTARTING, 1781.

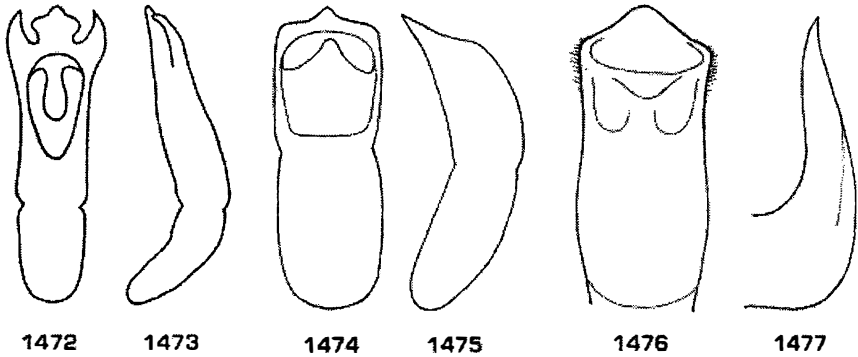
#### Auxiliary group F

Pronotum uniformly black, legs at least partly pale.

#### Key to species

1. All legs pale, mid and hind femora often partly darkened ..... **2**.
- Legs only partly pale ..... **5**.
2. Elytra entirely black ..... **3**.
- Each elytron with four (anterior, subhumeral, central and apical) orange spots. General view as in plate XXXV, **phot. 309**. Pronotum very finely and sparsely punctate, punctures of elytra fine, shallow, arranged in regular rows. Pronotum in male black with lateral and anterior stripes yellow, in female entirely black. Aedeagus as in figs **1474, 1475**. Length 3.6–4.8 mm (= *gravidus* HERRICH-SCHÄFFER, 1838). Variations: elytron black, epipleuron reddish (ab. *tenebricosus* WEISE, 1882), on elytron the subhumeral spot present only (ab. *anticemaculatus* CHABAUT, 1902), on elytron the apical spot present only (ab. *posticemaculatus* PIC, 1901), on elytron anterior and apical spot present only (ab. *prescutellaris* PIC, 1901), in male anterior margin of pronotum and legs entirely pale (ab. *sefrensis* PIC, 1900), pale colour strongly extended, on pronotum anterior and lateral margins broadly yellow, on hind half of elytra pale spots joined (ab. *susicus* KOCHER, 1958); description of ab. *japhaensis* PIC, 1923 concerns probably an aberration of *spilothorax* auxiliary group H, thesis 10). Distributed in Italy, southern France, Iberian Peninsula, Morocco, Algeria and Tunisia ..... **crassus** OLIVIER, 1791.
3. Elytral epipleuron in anterior part swollen, almost always yellow. Frons usually entirely yellow. Here a unnamed aberration of *flavipes* (auxiliary group I, thesis 16).
- Elytral epipleuron in anterior part not swollen, black ..... **4**.
4. In male anterior margin of pronotum narrowly yellow. Pronotum very finely, shallowly and sparsely punctate, punctures of elytra moderately strong, confusedly

- or semiregularly scattered. Length 3.6–4.8 mm. Distributed in southern and middle part of Europe ..... *signatifrons* SUFFRIAN, 1847.
- . Pronotum in both sexes black, strongly and closely punctured. Elytra shining black, strongly, randomly punctured, without traces of rows. Aedeagus as in figs **1476**, **1477**. General view as in plate XXXV, **phot. 310**. Length 3.2 mm (= *thibetanus* BREIT, 1918, nec PIC, 1917). Described from Tibet, based on two specimens only ..... *vouauxi* ACHARD, 1921.

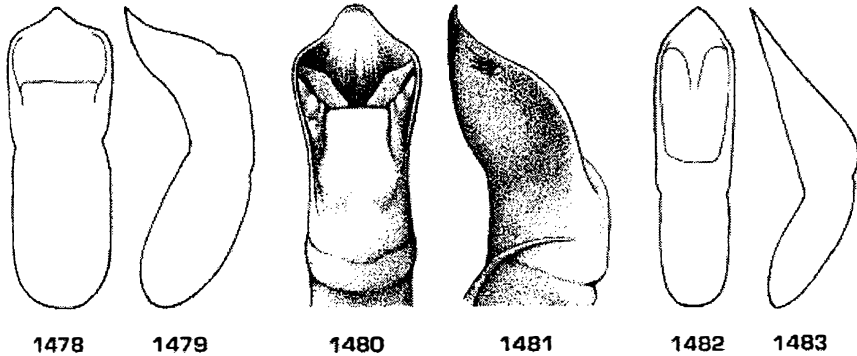


Figs 1472-1477. Aedeagus in dorsal and lateral view (1472, 1473 after WARCHAŁOWSKI 1991, 1474, 1475 after WARCHAŁOWSKI 2003, 1476, 1477 after BREIT, 1918): 1472, 1473 – *Cryptocephalus (Cryptocephalus) imperialis*; 1474, 1475 – *C. (C.) crassus*, 1476, 1477 – *C. (C.) vouauxi*.

5. Elytron black, usually only with a great apical spot orange, sometimes additionally with reddish little blurred spots (anterior, subhumeral and central). Pronotum in male with anterior and sometimes also lateral margins reddish, in female entirely black. Aedeagus as in figs **1478**, **1479**. Length 3.9–4.7 mm (= *sexpustulatus* ROSSI, 1790, nec VILLIERS, 1789, *octoguttatus* SCHNEIDER, 1792 nec LINNAEUS, 1767, *omissus* WEISE, 1882, *oneratus* WEISE, 1882, *lateniger* PIC, 1913, ). Variations: on elytron reddish blurred spots as above (ab. *abadjanidesi* PIC, 1923), reddish pattern of upper side almost entirely disappearing (ab. *nigerrimus* BALLION, 1878 nec CROTCHÉ, 1874. Caucasian species, after some authors conspecific with *octacosmus* (thesis 6) ..... *anticus* SUFFRIAN, 1848.
- . Elytron apart from apical spot with great, distinct, dark yellow or orange spots ..... 6.
6. Each elytron with four (anterior, subhumeral, central and apical) great orange spots. General view as in plate XXXV, **phot. 311**. In male pronotum with yellow anterior margin and little yellow spot on posterior angles, in female entirely black. Pronotum very finely and shallowly punctate, almost glassy, punctures of elytra relatively strong, arranged in regular rows. Aedeagus as in figs **1480**, **1481**. Length 3.2–3.8 mm (male) to 3.8–4.7 mm (female). Variations: lateral margins of pronotum yellow (ab. *balcanica* BURLINI, 1962), remaining aberrations and their names as in figs **1484–1489**. Distributed in southern part of western- middle- and eastern Europe from Catalonia and Belgium to Asia Minor, basin of Volga, Transcaspia and W China (Sinkiang) ..... *octacosmus* BEDEL, 1891.

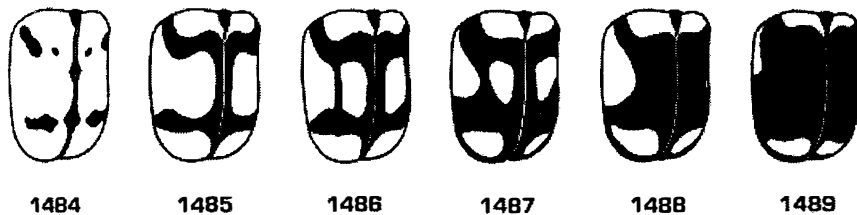


- Each elytron with two (subhumeral and apical) great orange spots. Body rather short and broad ..... 7.



Figs 1478-1483. Aedeagus in dorsal and lateral view (1480, 1481 after PETITPIERRE 2000, remaining after WARCHALOWSKI 2003): 1478, 1479 – *Cryptocephalus (Cryptocephalus) anticus*; 1480, 1481 – *C. (C.) octacosmus*, 1482, 1483 – *C. (C.) creticus*.

7. Body larger, clypeus and frons dark yellow, vertex black. Aedeagus as in figs **1482**, **1483**. Length 3.2–3.9 mm (male) to 3.8–4.7 mm (female). Endemic to Crete ..... ***creticus* SUFFRIAN, 1847.**
- Body smaller, head black. Pronotum very finely and sparsely punctate, punctures of elytra arranged in regular rows. Length 3.0 mm (= *libanensis* PIC, 1901). Described from Libanon, based on one specimen (sex not determined) only ..... ***distinctenotatus* PIC, 1901.**



Figs 1484-1489. *Cryptocephalus (Cryptocephalus) octacosmus*, variations of elytral pattern (after WARCHALOWSKI 1991): 1484 – ab. *vastus* KASZAB, 1962; 1485 – ab. *oneratus* WEISE, 1882; 1486 – ab. *pusztiae* KASZAB, 1962; 1487 – typical form; 1488 – ab. *omnisus* WEISE, 1882; 1489 – ab. *lateniger* PIC, 1913.

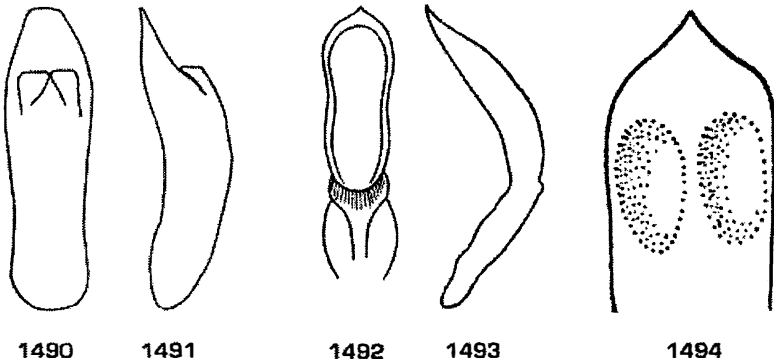
## Auxiliary group G

Pronotum uniformly pale except for basal marginal ridge, sometimes undefined darkening, and sometimes very narrow black stripe on marginal ridge.

*C. terolensis* Pic, 1908, an insufficiently studied species from Iberian Peninsula, is not included in the key.

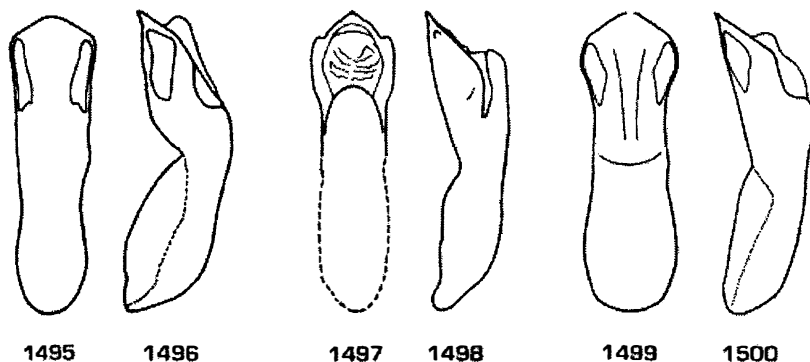
### Key to species

1. Scutellum black ..... 2.
- . Scutellum pale, sometimes blackish margined ..... 7.
2. Ground of elytra black ..... 3.
- . Ground colour of elytra not black ..... 4.
3. Elytra usually entirely black, rarely with narrow lateral and apical margins pale. Here colour form of *melanoxanthus* (see auxiliary group H, antithesis 17).
- . Each elytron with eight (3, 2, 2, 1) or seven (3, 2, 2) pale yellow spots. Legs pale. General view as in plate XXXV, **phot. 312**. Aedeagus as in figs **1490, 1491**. Length 3.6–5.2 mm (= *takanashii* CHŪJŌ, 1935, *insularis* CHŪJŌ, 1935, *loochooensis* CHŪJŌ, 1935). Distributed in Japan, Ryukyu Archipelago and Taiwan. Forms a few subspecies distributed out of Palaearctic ..... ***perelegans*** BALY, 1873.
4. Upper side brownish red with yellowish pattern. Head yellow with red-brown pattern on frons and vertex. Pronotum with anterior (narrowly) and lateral (broadly) marginal stripes yellow. Hind marginal ridge of pronotum and basal ridge of elytra black. On elytra narrow transverse band at base and a oblique lateral spot yellowish. Underside black, prosternum and epimeres of metasternum yellow. Legs red-brown, antennae pale, apices of antennomeres slightly infuscate. Aedeagus as in figs **1492, 1493**. Length about 4.5 mm. Described from Iran ..... ***rufoflavus*** LOPATIN, 1984.
- . Upper side yellowish or brownish red with black pattern ..... 5.



Figs 1490-1494. Aedeagus or its apical part in dorsal, ventral and lateral view (1490, 1491 after KIMOTO and TAKIZAWA 1994; 1492, 1493 after LOPATIN 1984; 1494 after MEDVEDEV 1982): 1490, 1491 – *Cryptocephalus (Cryptocephalus) perelegans*; 1492, 1493 – *C. (C.) rufoflavus*; 1494 – *C. (C.) tataricus*.

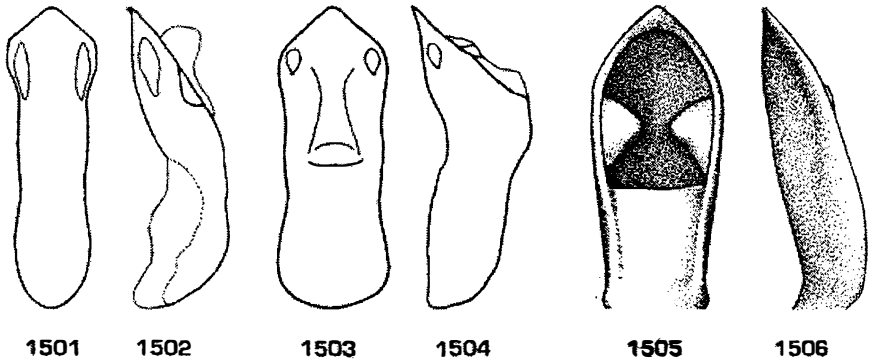
5. Upper side reddish, each elytron normally with two black spots (1, 1). Underside and legs entirely black. Pronotum very finely and sparsely punctate, almost glassy (*bimaculatus*-group) ..... **6.**
- Ground of upper side dark yellow or pale reddish, on each elytron four (2, 2) or only two (behind middle) black spots. In darker forms black elytral spots enlarged, forming two transverse bands. Elytra often black, lateral margins and apical part pale. General view as in plate XXXV, **phot. 313, 314.** Aedeagus as in fig. **1494.** Length 4.0–5.0 mm (= *rufus* KRAATZ, 1882, *hectastigmus* SOLSKY, 1882, *ephippiatus* JAKOBSON, 1901, *dorsiger* BREIT, 1918, *montivagus* LOPATIN, 1954). Distributed in Transcaспia, Siberia (Altai, Sayan), Mongolia and Transbaicalia ..... **tataricus** GEBLER, 1841.
6. North-African species ..... **7.**
- European species ..... **9.**
7. Antennae entirely black. Aedeagus as in figs **1495, 1496.** Length 4.1–5.5 mm. Distributed in Morocco and Algeria ..... **dogueti** BOURDONNÉ, 1994.
- Antennal articles 1–4 or 2–4 reddish ..... **8.**



Figs 1495–1500. Aedeagus in dorsal and lateral view (after BOURDONNÉ 1994): 1495, 1496 – *Cryptocephalus (Cryptocephalus) dogueti*; 1497, 1498 – *C. (C.) elatus*, 1499, 1500 – *C. (C.) numidicus*.

8. Species very large, body length 7.6–10.4 mm. General view as in plate XXXV, **phot. 315.** Punctures of elytra shallow, confused. Aedeagus as in figs **1497, 1498.** (= *molossus* FAIRMAIRE, 1879). Variation: on elytra hind spots absent (ab. *bremondi* PIC, 1953). Distributed in northern Morocco ..... **elatus** FABRICIUS, 1801.
- Species smaller, body length 4.6–7.2 mm. Externally similar to *bimaculatus* (thesis 10). Punctures of elytra usually semiregular. Aedeagus as in figs **1499, 1500.** Distributed in Morocco, Algeria and Tunisia ..... **numidicus** BOURDONNÉ, 1994.
9. Antennae entirely black. Aedeagus as in figs **1501, 1502.** Length 4.1–5.7 mm. Variation: on elytra hind spots absent (ab. *posticeobliteratus* PIC, 1900). Distributed in Spain, southern France and north-western Italy ..... **infirmior** KRAATZ, 1876.
- Antennal articles 1–4 or 2–4 reddish ..... **10.**

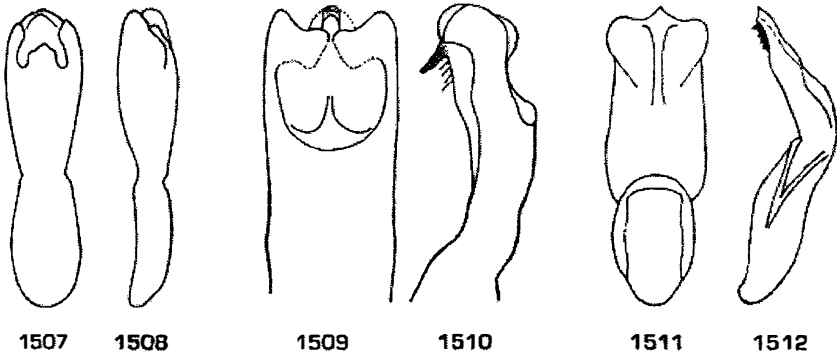
10. Body on average smaller, elytral spots usually little, sutural margins black. Aedeagus as in figs **1503**, **1504**. Length 4.3–6.8 mm (= *pominii* BURLINI, 1948, *agraphus* GOZIS, 1886, *bisbipustulatus* SUFFRIAN, 1853). Variations: on elytron posterior spot strongly enlarged (ab. *blocki* ROSSI, 1794), on each elytron present one (humeral) spot only (ab. *humeralifer* PIC, 1900), punctures of elytra extremely fine, almost disappearing (ab. *lissopterus* GOZIS, 1886). Distributed in middle and northern part of Italy and in southern France ..... ***bimaculatus*** FABRICIUS, 1781.
- . Body on average larger, elytral spots usually relatively great, sutural margins not darkened or brownish. General view as in plate XXXVI, **phot. 316**. Aedeagus as in figs **1505**, **1506**. Length 4.9–7.4 mm. Distributed in Iberian Peninsula and in southern France ..... ***pominorum*** BURLINI, 1955.



Figs 1501-1506. Aedeagus in dorsal and lateral view (1505, 1506 after PETITPIERRE 2000, remaining after WARCHAŁOWSKI 2003): 1501, 1502 – *Cryptocephalus (Cryptocephalus) infirmior*; 1503, 1504 – *C. (C.) bimaculatus*, 1505, 1506 – *C. (C.) pominorum*.

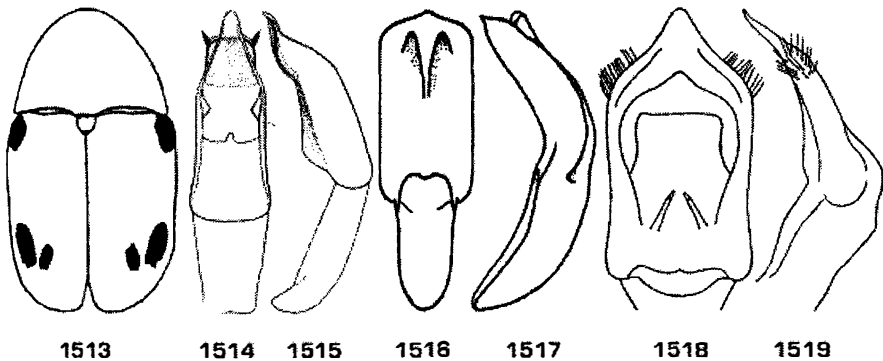
11. Body small (under 3.4 mm) ..... 12.
- . Body larger (over 3.4 mm) ..... 13.
12. Body very small. Upper side, legs, prosternum, mesoepimeres and apex of abdomen pale testaceous, remaining part of underside black. Aedeagus as in figs **1507**, **1508**. General view as in plate XXXVI, **phot. 317**. Length 2.2–2.8 mm (= *rastegari* RAPILLY, 1980). Described from Armenia, based on one male specimen only ..... ***xanthus*** KHNZORIAN, 1968.
- . Body length over 2.7 mm. Pronotum and ground of elytra smooth, impunctate. Ground of upper side yellow. On pronotum two large, longitudinal, rusty-brownish stripes or spots, on each elytron two large, darker, blurred spots, sometimes disappearing or fused in a large longitudinal stripe, darker in anterior part. Length 2.7–3.4 mm. Aedeagus as in figs **1509**, **1510**. Described from Tadzhikistan ..... ***turangae*** LOPATIN, 1961.
13. Elytra black, each elytron with 8 or 7 pale yellow spots. Here forms of *perelegans* (antithesis 3) with partly or entirely pale scutellum.
- . Elytra differently coloured ..... 14.

14. Pronotum very strongly, deeply and thickly punctate ..... **15.**  
 -. Pronotum not particularly strongly, deeply and thickly punctate ..... **10.**  
 15. European species. On each elytron 2–5 little black dots. Here some colour aberrations of *octomaculatus* (auxiliary group K, thesis 8).  
 -. Egyptian species. Here colour aberration of *punctatissimus* (auxiliary group B, thesis 5).



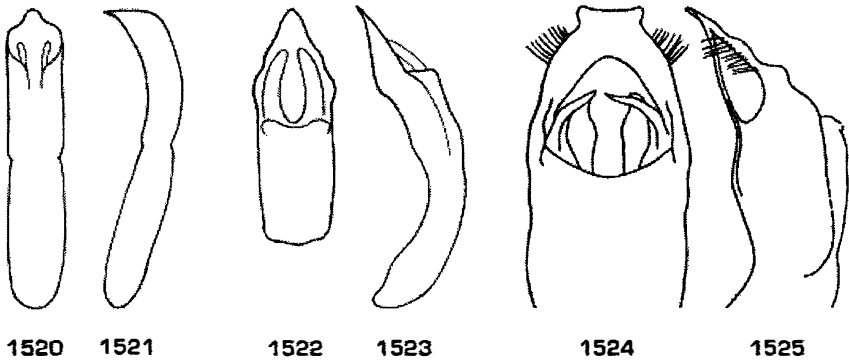
Figs 1507-1512. Aedeagus in dorsal and lateral view (1507, 1508 after IABLOKOFF-KHNZORIAN 1968; 1509, 1510 after LOPATIN 1961; 1511, 1512 after LOPATIN 1983): 1507, 1508 – *Cryptocephalus (Cryptocephalus) xanthus*; 1509, 1510 – *C. (C.) turangae*, 1511, 1512 – *C. (C.) saudiensis*.

16. Pronotum very finely and sparsely punctate or apparently impunctate ..... **17.**  
 -. Pronotum strongly, moderately strongly or finely but not sparsely punctate ..... **24.**



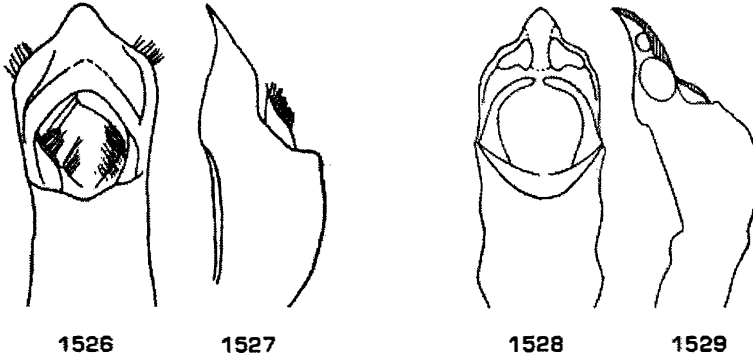
Figs 1513-1519. Elytral pattern and aedeagus in dorsal and lateral view (1513 after LOPATIN 1983; 1514, 1515 after SASSI 2005; 1516, 1517 after RAPILLY 1980; 1518, 1519 after LOPATIN 1977): 1513 – *Cryptocephalus (Cryptocephalus) saudiensis*, elytral pattern; 1514-1519 aedeagus: 1514, 1515 – *C. (C.) gabbari*, 1516, 1517 – *C. (C.) subruber*; 1518, 1519 – *C. (C.) bodungeni*.

17. Pronotum and ground of elytra smooth, impunctate or at least very weak, fine and shallow ..... 18.
- . Punctuation of pronotum distinct or at least well-perceptible ..... 20.
18. On each elytron two large, blurred, sometimes disappearing or fused, brown spots. Here some larger females of *turangae* (antithesis 12).
- . On elytra black spot distinct, not blurred ..... 19.
19. On each elytron three (one humeral and two preapical) small black spots (fig. 1513). Aedeagus as in figs 1511, 1512. Length 3.5 mm. Described from Saudi Arabia based on one male specimen only ..... **saudiensis** LOPATIN, 1983.
- . On each elytron a large, transverse, preapical spot. Aedeagus as in figs 1514, 1515. Length 3.2 mm. Described from Yemen ..... **gabbari** SCHÖLLER, 2005.
20. Body reddish yellow, stout. On each elytron two large black spots, scutellum pale, margined with black. Aedeagus as in figs 1516, 1517. Length 3.9–4.4 mm. Described from W Iran ..... **subruber** RAPILLY, 1980.
- . Upper side differently coloured ..... 21.
21. Elytral puncturation laterally partly random, but on the inner half forms very deep and dense, distinctly impressed rows. Body yellow, antennomeres 6–11 darkened, hind margin of pronotum and two small black spots on each elytra (1, 1) black. General view as in plate XXXVI, **phot. 318**. Aedeagus as in figs 1518, 1519. Length 6.0–7.5 mm. Forms a subspecies: elytra uniformly pale (subsp. *tadzhika* JACOBSON, 1925). Distributed in Kazakhstan, the subspecies in Tadzhikistan ..... **bodungeni**, JACOBSON, 1905.
- . Elytral puncturation does not form very dense, impressed rows ..... 22.
22. E Palearctic species. Body yellowish except antennomeres 5–11, narrow stripe along hind margin of pronotum and a broad longitudinal stripe on each elytra black. Aedeagus not studied. General view as in plate XXXVI, **phot. 319**. Length 3.6–4.8 mm. Distributed in Japan (Hokkaido, Honshu, Kyushu, Shikoku) ..... **scitulus** BALY, 1873.
- . W Palearctic species ..... 23.



Figs 1520–1525. Aedeagus in dorsal and lateral view (1520, 1521 after WARCHAŁOWSKI 2003; 1522, 1523 after LOPATIN and DOVGAILO 2002; 1524, 1525 after LOPATIN 1977): 1520, 1521 – *Cryptocephalus (Cryptocephalus) mayeti*; 1522, 1523 – *C. (C.) umbrosus*, 1524, 1525 – *C. (C.) rufofasciatus*.

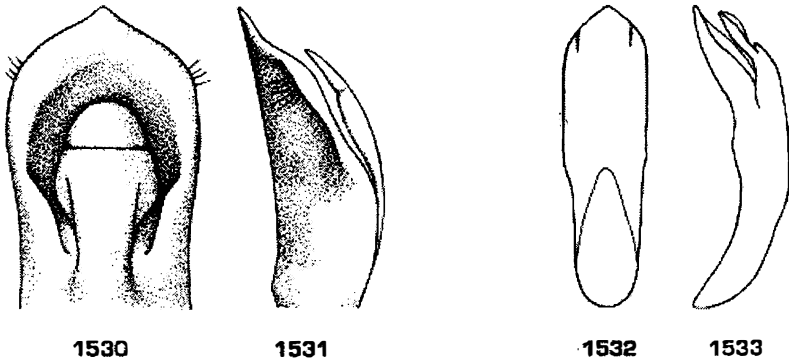
23. Body dark yellow, on pronotum usually a great, pale yellowish anchor-like pattern, on each elytron a long lateral rust-reddish, blurred stripe. General view as in plate XXXVI, **phot. 320**. Punctures of elytra confusedly scattered. Aedeagus as in figs **1520, 1521**. Length 3.9–4.9 mm. Occurs in southern France ..... **mayeti** MARSEUL, 1878.
- Very similar to *mayeti* (thesis 11), but pattern are darker and less blurred. On elytra occurs a darker, in posterior part narrowed sutural stripe, lateral stripes encroache on pronotum. Aedeagus not studied. Length 4.0–5.0 mm (= *pardoi* PIC, 1953). Described from Morocco ..... **vidali** PEYERIMHOFF, 1939.
24. Pronotum very thickly punctate, interstices approximately as broad as or narrower than diameter of punctures. Punctures of elytra arranged in regular rows ..... **25**.
- Pronotum not very thickly punctate, interstices at least two times broader than diameter of punctures ..... **30**.
25. Darker pattern on elytra form transverse bands or stripes ..... **26**.
- Darker pattern on elytra form spots or longitudinal, blurred stripes. A group of four species similar to each other, distinguishable only by the shape of aedeagus ..... **28**.



Figs 1526-1529. Apical half of aedeagus in dorsal and lateral view (1526, 1527 after LOPATIN 1977; 1528, 1529 after LOPATIN 1984): 1526, 1527 – *Cryptocephalus (Cryptocephalus) semiargenteus*; 1528, 1529 – *C. (C.) umbrosus*.

26. Upper side orange-yellow, on elytra sutural stripe, humeral spot and transverse band in apical part black. In paler coloured specimens only sutural stripe narrowly black, sometimes also a blackish spot in apical part of elytra. Aedeagus as in figs **1522, 1523**. Length 5.0–6.2 mm (= *ferrugineus* OGBLOBLIN, 1956). Distributed in Iran ..... **umbrosus** LOPATIN, 1956.
- On elytra no black sutural stripe ..... **27**.
27. Body dark yellow, metasternum dark brown, anterior margin of elytra, posterior margin of pronotum and tarsal claws black. On pronotum in posterior part laterally two oblique, blurred, pale rust-reddish stripes, on each elytron a short transverse stripe behind humerus and a entire transverse stripe in posterior part also pale rust-reddish. General view as in plate XXXVI, **phot. 321**. Aedeagus as in figs **1524, 1525**.

- Length 3.6–4.8 mm (= *plustchevskyi* JACOBSON, 1893, *transverseis* REITTER, 1895, *meyeri* REITTER, 1897, *rickmersi* WEISE, 1900). Distributed mostly in Turkmenistan, reported also from Transcaucasia ..... **rufofasciatus** SOLSKY, 1881.
- . Similar to previous species, somewhat smaller (male about 3.5 mm). Described from Israel. *C. margaritae* LOPATIN, 1997, newly synonymized with *dumonti* (auxiliary group H, antithesis 35).
28. Lateral margins of pronotum almost straight, strongly convergent anteriorly. Upper side orange yellow, sutural ridge often blackened, in apical part of each elytron a small, dark spot. See *umbrosus*, thesis 26.
- . Pronotum weakly narrowed anteriorly, its margins rounded ..... **29.**



Figs 1530–1533. Aedeagus or its apical part in dorsal and lateral view (1530, 1531 after PETITPIERRE 2000; 1532, 1533 after RAPILLY 1980): 1530, 1531 – *Cryptocephalus (Cryptocephalus) sulphureus*; 1532, 1533 – *C. (C.) surdus*.

29. Frons densely, uniformly punctured. Upper side yellow, on each elytron two small black spots, mid part of suture often blackened. Dark coloured specimens with black pattern as in *umbrosus* (thesis 26). General view as in plate XXXVI, **phot. 322**. Aedeagus as in figs **1526, 1527**. Length 5.0–6.5 mm. Distributed in Transcaucasia, in Kazakhstan occurs subsp. *mujunkumensis* LEBEDEV, 1931, with ground of upper side reddish and black pattern more expanded .... **semiargenteus** REITTER, 1894.
- . Frons densely punctured at eyes only, its remaining surface with sparse, large punctures mostly in anterior part. General body outline narrower as in *semiargenteus* (thesis 29). Described from Iran ..... **limarius** LOPATIN, 1984.
30. Elytra loosely punctate, in the second whole row about 20 punctures. Upper side pale yellowish, on pronotum two great, blurred, pale rust-reddish spots. See subgenus *Asionus*, auxiliary group E, antithesis 3, *acupunctatus* FAIRMAIRE, 1873.
- . Elytra more thickly punctate, in the second row at least 30 punctures ..... **31.**
31. Pronotum finely and shallowly, somewhat indistinctly punctate, its ground very finely reticulate. Under side and legs black. Upper side orange yellow, on each elytra and apical part two black spots. General view as in plate XXXVI, **phot. 323**. Aedeagus not studied. Length 6.3–7.2 mm. Described from Arabian Peninsula ..... **yemenicus** LOPATIN, 1999.



- Pronotum distinctly punctate, underside at least partly and legs entirely pale. Upper side yellowish, on pronotum often a pale, anchor-like pattern. Length 3.4–4.6 mm. Three species very similar to each other ..... **32.**
- 32. Species from western part of Mediterranean area. General view as in plate XXXVI, **phot. 324.** Aedeagus as in figs **1530, 1531.** Length 4.0–5.0 mm (= *holoxanthus* FAIRMAIRE, 1859). No variations were described (v. *notatipennis* PIC, 1896 not here) ...  
..... ***sulphureus*** OLIVIER, 1808.
- Species from W Asia ..... **33.**
- 33. Species described from Iran, but distributed also in Asia Minor. Elytra yellowish with pale brownish humeral spot. Aedeagus as in figs **1532, 1533.** Length 3.8–4.8 mm ...  
..... ***surdus*** RAPILLY, 1980.
- Species known from Iran only. Elytra yellowish with roundish black humeral spot and a irregular blackish spot before apex (trace of a criss-cross transverse band). See *vitellinus*, subgenus *Asionus*, auxiliary group B, thesis 2.

### Auxiliary group H

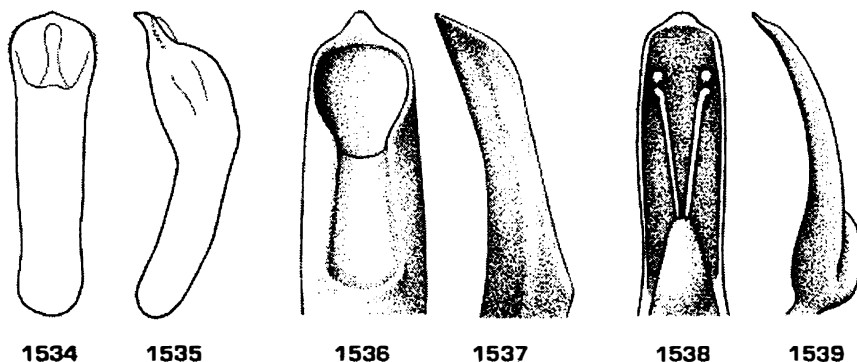
Pronotum bicolorous, elytral punctures arranged in longitudinal rows.

#### Key to species

Insufficiently described *Cryptocephalus licenti* CHEN, 1942 not included in the key.

1. Ground colour of upper side yellow, apical and basal margins of pronotum, basal margin of elytra, margins of scutellum, 4 small spots in transverse row on pronotum, on each elytron humeral spot and two smaller spots behind midle, blackish. Externally similar to *surdus* (auxiliary group G, thesis 23), but upper side with blackish spots (fig. **1540**), pronotum smooth, and elytra finer punctate. Male unknown. Length 4.5 mm. Described from Israel based on one female only .....  
..... ***freidbergi*** LOPATIN et CHIKATUNOV, 1997.
- Upper side differently coloured ..... **2.**
2. Elytra pale with black or brown longitudinal stripes ..... **3.**
- Elytral pattern never form longitudinal stripes, usually in form of spots or transverse bands, sometimes ill-defined ..... **6.**
3. Species from E Asia. Upper side orange or reddish. On pronotum two black spots somewhat prolonged backward. Rather broad sutural stripe and on each elytron longitudinal sublateral stripe black. General view as in fig. **1541.** Aedeagus as in figs **1534, 1535.** Length 2.9–3.6 mm (= *yanoi* CHŪJŌ, 1938, *klapperichi* PIC, 1954). Distributed in Ussuria, N China, Korea and Japan (Honshu, Kyushu) .....  
..... ***limbatipennis*** JACOBY, 1885.
- European species ..... **4.**
4. On each elytron blurred, broad, light brownish or reddish median longitudinal stripe, punctures in rows usually darkened. Pronotum blackish with two great reddish or brownish lateral spots. General view as in plate XXXVII, **phot. 325.** Aedeagus as in figs **1536, 1537.** Length 2.2–3.5 mm. Distributed in southern France, Iberian Peninsula and in Morocco ..... ***lineellus*** SUFFRIAN, 1849.

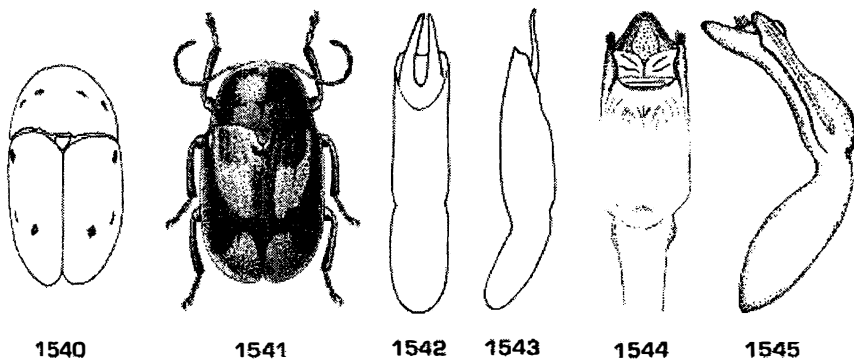
- Elytra with three or five distinct, black, longitudinal (common sutural and on each elytron a median) stripes ..... 5.
- 5. Pygidium black, on pronotum yellow lateral stripe narrow. General view as in plate XXXVII, phot. 326. Legs yellowish with darkened femora and tarsi. Aedeagus as in figs 1538, 1539. Length 2.7–3.4 mm. Variations: black elytral stripes not joined (ab. *apiceprolungatus* Pic, 1900), rarely median stripe reduced to a longitudinal humeral spot (unnamed). Distributed in Iberian Peninsula ..... *celtibericus* SUFFRIAN, 1848.
- Pygidium black, broadly yellowish margined. On pronotum yellow lateral stripe broader, median stripe usually absent. Length about 2.8 mm. See *curda* JACOBSON, 1897 (subgenus *Asionus*).



Figs 1534-1539. Aedeagus or its tubular part in dorsal and lateral view (1534, 1535 after LOPATIN and DOVGAILO 2002, remaining after PETITPIERRE 2000): 1534, 1535 – *Cryptocephalus (Cryptocephalus) limbatipennis*; 1536, 1537 – *C. (C.) lineellus*. 1538, 1539 – *C. (C.) celtibericus*.

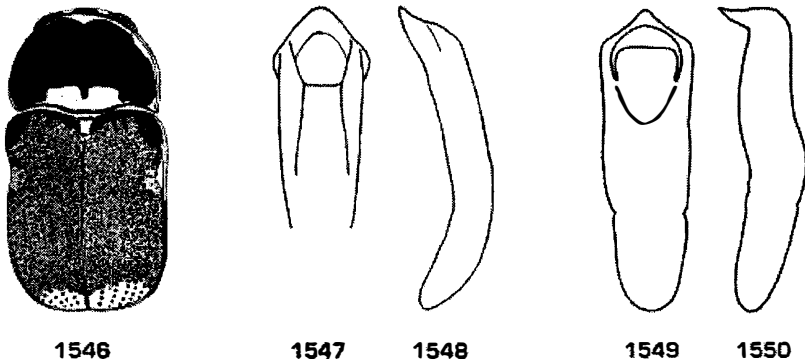
- 6. Ground of pronotum blackish or at least black colour covers at least a half of surface ..... 7.
- Ground of pronotum yellowish, testaceous or reddish or at least pale colour covers a half of surface ..... 26.
- 7. Pronotum entirely black ..... 8.
- On pronotum also pale colour present ..... 10.
- 8. Elytra black with yellow or orange spots. Females of *anticus* (auxiliary group F thesis 5), *crassus* (auxiliary group F, antithesis 2) and *octoguttatus* (antithesis 19).
- Elytra not black with yellow or orange spots ..... 9.
- 9. Each elytron reddish with one (humeral only) or four (2, 2) small black spots. Male unknown. Length 4.3–4.8 mm. Described from Afghanistan ..... *povolnyi* LOPATIN, 1969.
- Elytra yellowish, lateral and sutural margins rather broadly blackened, on each elytron two black spots (premedian and postmedian), sometimes connected by a longitudinal stripe. Punctuation of elytra fine, somewhat confuse, arranged in semiregular, paired rows. Aedeagus not studied. Length 5.0–5.5 mm (= *bisbicrucia-*

- tus* CHEN, 1942, nec PIC, 1907). Described from N China (Kansu) .....  
 ..... *melaphaeus* SCHÖLLER et SMETANA, 2009.
10. Pronotum black, in both sexes with six orange spots: two broad lateral stripes, two discal spots, one anterior and one prescutellar spot. General view as in plate XXXVII, **phot. 327**. Aedeagus as in figs **1542, 1543**. Length 3.5–4.3 mm (= *maculicollis* SUFFRIAN, 1857, nec KLUG, 1835, *maculicollis* REY, 1860, nec KLUG, 1835, *inscitus* WARCHAŁOWSKI, 1999). Variation: orange spots on elytra extended, subhumeral and median spots fused (ab. *douaranus* PIC, 1934). Distributed in eastern part of the Mediterranean region (Egypt, Greece) ..... *spilothorax* JACOBSON, 1924.
- Pale colour on pronotum forms marginal, sometimes also median, pattern ..... **11**.
11. On pronotum anterior and lateral margins yellowish, before scutellum two transverse or oblique pale yellowish spots. Species from NE Asia ..... **12**.
- Pronotum without two pale spots on dark ground before scutellum ..... **14**.
12. Elytra reddish with black spots. Here forms of *triangularis* (antithesis 40).  
 - Elytra black or blackish with pale spots ..... **13**.
13. Smaller. Before scutellum two fused, short, transverse yellowish spots. On elytra pale spots behind humerus and at apex (fig. **1546**). Length 3.2 mm. Aedeagus as in figs **1544, 1545**. Described from basin of Amur, based on one male only .....  
 ..... *zejensis* MIKHAILOV, 1999.
- Larger. Before scutellum two oblique yellowish spots. On each elytron two large yellowish spots, in midlength and at apex. Lateral borders of pronotum flattened, species externally somewhat similar to *latimargo* (auxiliary group E, antithesis 8). Aedeagus as in figs **1547, 1548**. Length 4.7–5.7 mm (= *amurensis* HEYDEN, 1884). Distributed in E Siberia (basin of Amur and Ussuri) and in Korea .....  
 ..... *tetrathyrus* SOLSKY, 1872.
14. Pronotum black with pale marginal (anterior or anterior and lateral) stripe. On median line no pale pattern, hind part of pronotum before scutellum entirely black ..... **15**.
- On pronotum pale pattern on median line present, usually also before scutellum ....  
 ..... **20**.



Figs 1540-1545. General view, aedeagus in dorsal and lateral view (1540 after LOPATIN and CHIKATUNOV 1997; 1541 after KIMOTO and TAKIZAWA 1994; 1542, 1543 after Lopatin and Dovgailo 2002; 1544, 1545 after MIKHAILOV 1999): 1540 – *Cryptocephalus (Cryptocephalus) freidbergi*; 1541 – *C. (C.) limbatipennis*; 1542, 1543 – *C. (C.) spilothorax*; 1544, 1545 – *C. (C.) zejensis*.

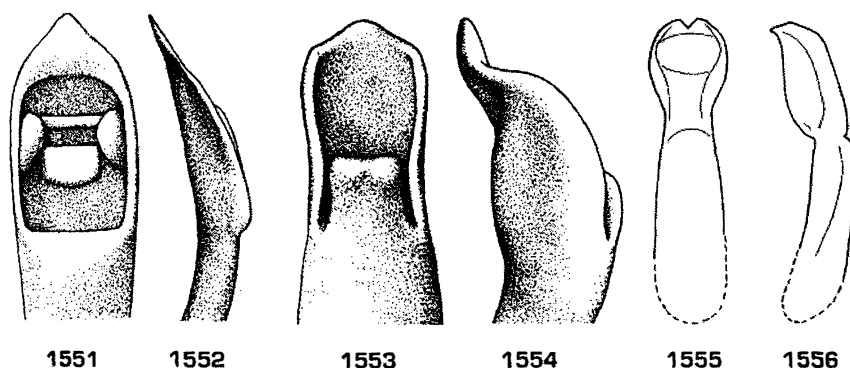
15. Pronotum black with narrow yellowish stripe along anterior margin and with hind angles orange or dark yellow. On frons two yellow spots (female) or x-shaped yellow pattern (male). Elytron black with subhumeral and apical spots yellow or orange. Fore tibiae yellow or orange, mid and hind legs black. General view as in plate XXXVII, **phot. 328**. Aedeagus as in figs **1549, 1550**. Length 3.1–4.2 mm (male) to 3.4–4.9 mm (female) (= *bivittatus* GYLLENHAL, 1813, *cruciatus* MARSEUL, 1875, *vittiger* MARSEUL, 1875, *arquatus* WEISE, 1882, *bivittiger* PIC, 1909, *winkleri* PIC, 1913). Variations: on elytra apical spot absent (ab. *nigellus* BURLINI, 1955), other variations with more or less reduced black pattern of elytra. Distributed in almost whole Europe except northern part of Scandinavia, reported also from Asia Minor ...  
 ..... ***moraei*** (LINNAEUS, 1758).
- . Pronotum black with narrow yellowish stripe along anterior margin, hind angles black ..... **16**.
16. Length about 2.5 mm, externally similar to representatives of subgenus *Burlinius*. Upper side black, in male lateral margins of pronotum narrowly and elytral epipleura yellowish, in female also median part of anterior margin of pronotum, yellowish. Variations: elytron with a little, pale apical spot (male = ab. *mekalianus* PIC, 1905), elytron with a little pale apical and with one at anterior margin (ab. *zizyphi* PIC, 1914). Species from North Africa ..... ***reichei*** MARSEUL, 1875.
- . Length over 3.5 mm ..... **17**.



Figs 1546-1550 (1546 after MIKHAILOV 1999; 1547, 1548 after LOPATIN and DOVGAILO 2002; 1549, 1550 after WARCHALOWSKI 2003): 1546 *Cryptocephalus (Cryptocephalus) zejensis*, pattern of upper side; 1547-1550 - aedeagus in dorsal and lateral view: 1547, 1548 - *C. (C.) tetrathyrus*; 1549, 1550 - *C. (C.) moraei*.

17. Elytra rust-yellow with black humeral spot. Length 4.3 mm. Male unknown. Insufficiently studied species, described from Transbaicalia, based on one female only ..... ***pseudocautus*** MEDVEDEV, 1973.
- . Elytra black with dark yellow or orange spots ..... **18**.
18. Anterior orange spots of elytra joined behind scutellum. Here males of *anticus* (auxiliary group F, thesis 4)
- . Anterior orange spots of elytra broadly separated ..... **19**.

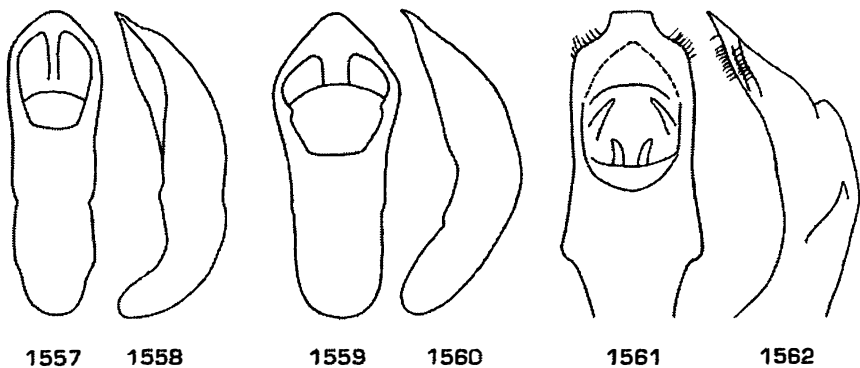
19. Body relatively short and broad. All legs normally yellow, sometimes with more or less darkened femora. See *crassus* (auxiliary group F, antithesis 2).
- Body not especially short and broad. General view as in plate XXXVII, **phot. 329**. Fore legs yellow or orange with darkened femora and usually with a blackish stripe along dorsal margin of tibiae. Mid and hind legs always darkened, often blackish with dark reddish mid tibiae. Aedeagus as in figs **1551, 1552**. Length 3.6–4.8 mm (= *koyi* SUFFRIAN, 1848). Variations: subhumeral and median spots fused (ab. *bisbiconjunctus* PIC, 1900), elytra orange, humeral spot and a transverse stripe in posterior part black (ab. *martinezi* WEISE, 1882), like in *martinezi*, but posterior black stripe interrupted (ab. *subinterruptus* PIC, 1900), median spot absent (ab. *ponferradanus* PIC, 1924), in female anterior margin of pronotum yellowish (ab. *marisimilis* BURLINI, 1958). Distributed in southern France and Iberian Peninsula .....  
 ..... **octoguttatus** (LINNAEUS, 1767).



Figs 1551-1556. Aedeagus or its apical half in dorsal and lateral view (1555, 1556 after IABLOKOFF-KHZNORIAN 1968, remaining after PETITPIERRE 2000): 1551, 1552 – *Cryptocephalus (Cryptocephalus) octoguttatus*; 1553, 1554 – *C. (C.) espanoli*; 1555, 1556 – *C. (C.) araxicola*.

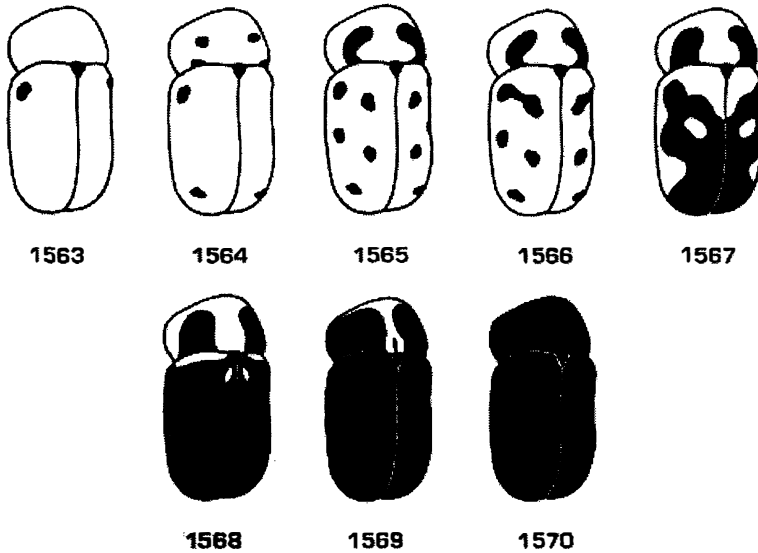
20. Elytra black with two (premedian and preapical) transverse dark reddish spots. Here melanotic forms of *triangularis* (antithesis 40).
- Elytra differently coloured ..... **21**.
21. Elytra yellowish with black humeral spot only. Pronotum black, rather strongly, uniformly punctured, shining, his lateral and anterior margins alike a long median stripe yellow. Scutellum yellow. Legs pale yellowish. Aedeagus as in figs **1553, 1554**. General view as in plate XXXVII, **phot. 330**. Length 2.5–3.2 mm. Distributed in Iberian Peninsula ..... **espanoli** BURLINI, 1965.
- Elytra differently coloured ..... **22**.
22. Body small, length under 2.9 mm. Upper side black, anterior and lateral margins of pronotum (in paler coloured specimens also narrow, median longitudinal stripe), on each elytron two large spots (premedian and apical) yellowish. Legs pale, tarsi darkened. Apex of aedeagus deeply incised figs **1555, 1556**. Length 2.2–2.9 mm.

- By some authors discussed as a representative of subgenus *Burlinius*. Described from Armenia ..... **araxicola** IABLOKOFF-KHNZORIAN, 1968.
- Length of body always over 3.0 mm ..... 23.
  - 23. W Palearctic species. Lateral margins of pronotum broader and somewhat flattened, visible simultaneously on whole length ..... 24.
  - E Palearctic species. Lateral margins of pronotum smaller, visible simultaneously in hind part only ..... 25.
  - 24. On average smaller, underside entirely black. General view as in plate XXXVII, **phot. 331**. Aedeagus as in figs 1557, 1558. Length 3.2–4.0 mm (= *decempunctatus* LINNAEUS, 1761, *betulaenanae* SCHILLING, 1838). Variations and their names see caption to figs 1563–1570. It was also described variation coloured as in ab. *moestus*, but without pale spots at scutellum (ab. *externesignatus* PIC, 1925). Lives on *Salix*. Distributed in western, northern and central part of Europe ..... **decemmaculatus** (LINNAEUS, 1758).
  - On average larger, underside very rarely entirely black, usually at least mesosternum partly yellowish. General view as in plate XXXVII, **phot. 332**. Aedeagus as in figs 1559, 1570. Length 3.7–4.6 mm (= *trilineatus* FABRICIUS, 1798). Variations and their names see caption to figs 1571–1582, but ab. *lapponicus* PIC, 1939 belongs probably to *decemmaculatus* (thesis 24). Lives on *Alnus*. Distributed in western France, Germany, Poland, basins of Danube and Dnestr, northern Italy and in northern part of Balkan Peninsula ..... **frenatus** LAICHTARTING, 1781.
  - 25. Legs pale. Elytra dark yellow on each elytron four large (2, 2) spots and one smaller apical spot. Here forms of *tetradecaspilotus* (antithesis 44) with stronger developed black pattern on pronotum.
  - Legs black. On elytra three transverse black bands (premedian, postmedian and apical). Here forms of *trifasciatus* (antithesis 37) with stronger developed black pattern on pronotum.
  - 26. Pronotum entirely pale, without black pattern, hind marginal ridge black only ... 27.
  - Pronotum with black or brown pattern ..... 29.



Figs 1557–1562. Aedeagus in dorsal and lateral view (1561, 1562 LOPATIN 1977, remaining after WARCHALOWSKI 1991): 1557, 1558 – *Cryptocephalus (Cryptocephalus) decemmaculatus*; 1559, 1560 – *C. (C.) frenatus*; 1561, 1562 – *C. (C.) monilis*.

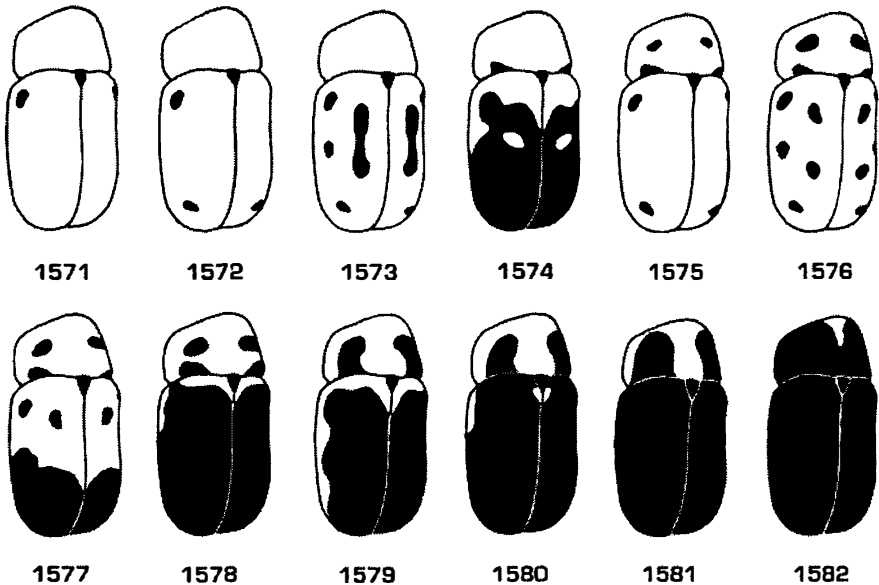
27. Ground of elytra yellowish-red, on each elytron three black spots (1 humeral and 2 preapical). See *saudiensis*, auxiliary group G, thesis 19.
- Ground of elytra black, on each elytron 6 or 7 yellow spots ..... **28.**



Figs 1563-1570 (after WARCHALOWSKI 1991). *Cryptocephalus (Cryptocephalus) decemmaculatus*, variations of pronotal and elytral pattern: 1563 – ab. *banatensis* PIC, 1917; 1564 – ab. *solutus* WEISE, 1882; 1565 – typical form; 1566 – ab. *scenicus* WEISE, 1882; 1567 – ab. *gallicus* PIC, 1917; 1568 – ab. *moestus* WEISE, 1882; 1569 – ab. *bothnicus* LINNAEUS, 1758; 1570 – ab. *barbareae* LINNAEUS, 1761.

28. On each elytron seven (2, 2, 2, 1) yellow spots. Antennae shorter, in male approximately as long as elytral suture. 3.7–5.2 mm (= *insularis* CHŪJŌ, 1935, *takahashii* CHŪJŌ, 1935). Here colour variations of *perelegans* (auxiliary group G, antithesis 3) with bicolorous (spotted) pronotum.
- On each elytron six (3, 2, 1) yellow spots. Antennae longer, in male distinctly longer than elytral suture. Aedeagus not studied. Length 4.1–4.2 mm. Described from Japan (Honshu), newly reported also from Taiwan ..... **ohnoi** KIMOTO, 1983.
29. On pronotum darker colour forms glasses- or M-shaped, not always clear, usually brown or brownish, only rarely black pattern, on elytra 1–3 blurred or wavy, sometimes criss-cross transverse bands. This group of species, characterized by pronotal pattern and regular puncturation of elytra („*undulatus*-group“) is usually ranked as belonging to subgenus *Asionus*, however not all representatives have prolonged 4<sup>th</sup> tarsomere. See subgenus *Asionus*, key to auxiliary groups, thesis 2.
- On pronotum colour does not form glasses- or M-shaped pattern, transverse dark bands on elytra not wavy or criss-cross ..... **30.**

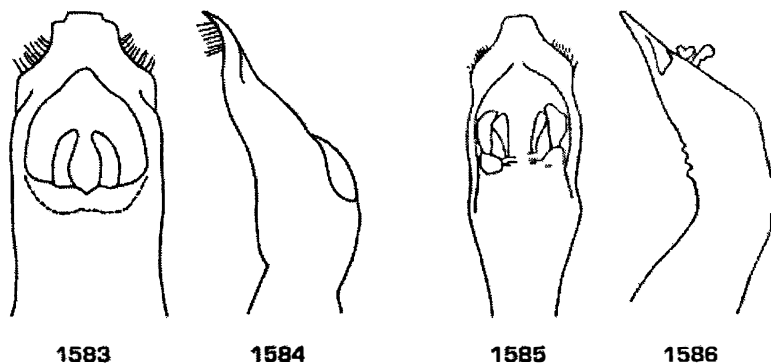
30. Body, legs and upper side pale, from yellow to pale red-brown, dark pattern very rarely blackish, usually brown or reddish, length of body under 4.0 mm (exceptionally, in very large females to 4.5 mm). On elytra dark pattern large and blurred, forming humeral spot and broad band in hind part or two broad bands. Six species distributed in Near and Middle East to neighbouring parts of China and Mongolia, similar to each other, nearly allied to “*undulatus* group” (subgen. *Asionus*), but with relative short tarsomere 4 ..... 31.
- Not as above ..... 36.
31. In male frons between eyes narrower than transverse diameter of upper part of eye ...  
..... 32.
- In male frons between eyes broader than transverse diameter of upper part of eye ...  
..... 33.
32. On average larger. Dark pattern on pronotum blackish or dark brown, on elytra two transverse, broad, slightly blurred bands. Aedeagus as in figs 1561, 1562. Length 3.5–4.5 mm. Distributed in W Mongolia, NW China and E Kazakhstan ..... *monilis* WEISE, 1890.
- On average smaller. Dark pattern on upper side very pale, ochraceous or orange. Aedeagus as in figs 1583, 1584. Length 3.2–3.8 mm. Distributed in E Usbekistan ...  
..... *kiritschenkiellus* LOPATIN, 1961.



Figs 1571-1582 (after WARCHALOWSKI 1991). *Cryptocephalus* (*Cryptocephalus*) *frenatus*, variations of pronotal and elytral pattern: 1571 – ab. *callifer* SUFFRIAN 1848; 1572 – ab. *argentorati* PIC 1917; 1573 – ab. *disjunctus* PIC 1917; 1574 – ab. *zoltani* CSIKI 1953; 1575 – ab. *binotatipennis* PIC 1917; 1576 – ab. *flavescens* SCHNEIDER 1891; 1577 – ab. *notatithorax* PIC 1909; 1578 – ab. *barbarorum* PIC 1917; 1579 – ab. *semniger* WEISE 1882; 1580 – typical form; 1581 – ab. *fabricii* WEISE 1882; 1582 – ab. *lapponicus* PIC 1939.

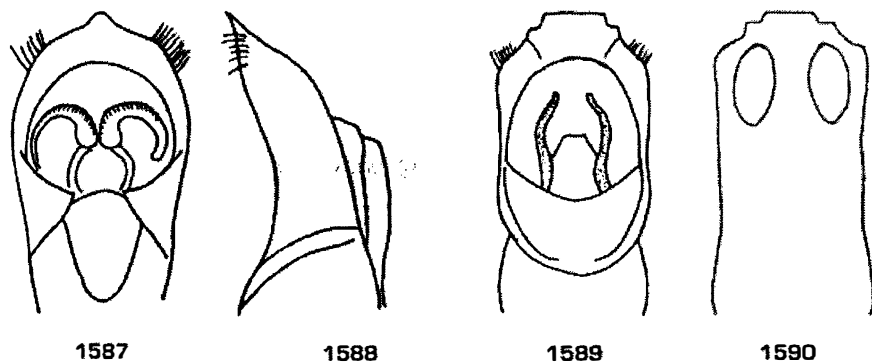


33. Upper side covered by short but distinct, on pronotum adpressed and on elytra erect hairs. Pattern on upper side dark brown or pitchy, similar as in *monilis* (thesis 32), but fore band on elytra usually reduced to humeral spot. Aedeagus as in figs 1585, 1586. Length 3.6–4.0 mm. Distributed in SE Iran ..... ***moniliformis*** LOPATIN, 1980.  
 -. Upper side bare or with very sparse, short, barely perceptible hairs ..... **34.**



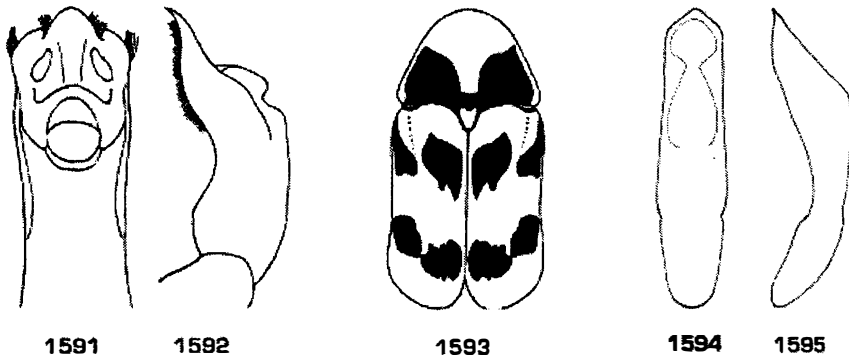
Figs 1583-1586. Aedeagus in dorsal and lateral view (1583, 1584 after LOPATIN 1977; 1585, 1586 after LOPATIN 1980): 1583, 1584 – *Cryptocephalus (Cryptocephalus) kiritschenkiellus*; 1585, 1586 – *C. (C.) moniliformis*.

34. Apex of aedeagus (figs 1587, 1588) with small, obtuse lamella. General view as in plate XXXVII, phot. 333. Length 3.0–3.8 mm. Distributed in Transcaspia: Kazakhstan (Aral, Kizil-Kum), Turkmenia (Kara-Kum), Uzbekistan and Tadjikistan ..... ***curtissimus*** PIC, 1907.  
 -. Apex of aedeagus with short, broad, transverse lamella ..... **35.**



Figs 1587-1590. Apical part of aedeagus in dorsal and lateral view (1587, 1588 after LOPATIN 1977; 1589, 1590 after LOPATIN 1997): 1587, 1588 – *Cryptocephalus (Cryptocephalus) curtissimus*; 1589, 1590 – *C. (C.) dumonti*.

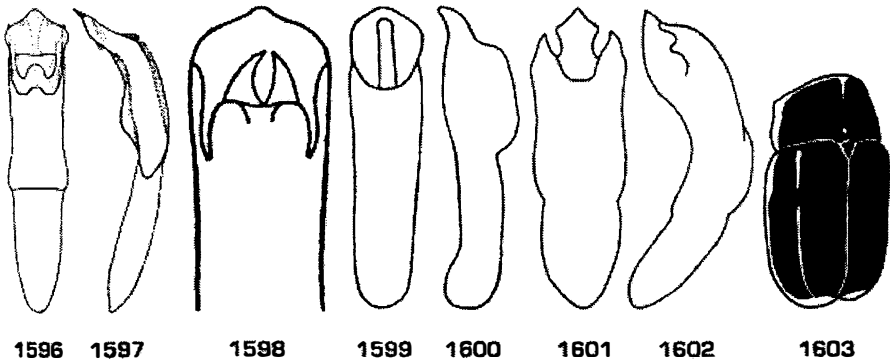
35. Larger. Pattern on upper side very pale, not always perceptible. Here darker coloured specimens of *rufofasciatus* (auxiliary group G, thesis 26).
- . Similar to *rufofasciatus* (auxiliary group G, thesis 27), but smaller. Aedeagus as in figs 1589, 1590. Length 3.4–3.7 mm (= *margaritae* LOPATIN, 1997). Known from Algeria (*dumonti*) and Israel (*margaritae*) only ..... *dumonti* PEYERIMHOFF, 1924.
36. On pronotum two large black spots, fused with black hind margin, on each elytron four large black spots (2, 2). Outline of body as in fig. 1593. Aedeagus as in figs 1591, 1592. Length 6.0–7.2 mm. Described from Saudi Arabia, based on one pair only; probably conspecific with *senegalensis* (thesis 43) ..... *elkhalidii* LOPATIN, 1983.
- . On pronotum before middle two black, roundish spots (sometimes fused or enlarged and prolonged backward) ..... 37.



Figs 1591-1595 (1591-1593 after LOPATIN 1983; 1594, 1595 after LOPATIN and CHIKATUNOV 2000): 1593 – pattern on upper side; remaining – apical half of aedeagus in dorsal and lateral view: 1591-1593 – *Cryptocephalus (Cryptocephalus) elkhalidii*; 1594, 1595 – *C. (C.) trifasciatus*.

37. Upper side dark orange to red brick, on elytra three transverse black bands. On pronotum two black, sometimes fused, roundish large spots, two black transverse spots at hind margin usually fused into broad, marginal band. General view as in plate XXXVIII, phot. 334. Aedeagus as in figs 1594, 1595. Length 4.6.–5.8 mm (= *orientalis* HOPE, 1831, *fainanensis* PIC, 1928). Variation: dark specimens, pronotal spots fused in the middle, legs black or blackish (unnamed). Distributed in Indochina and S China, Nepal, Central China and Japan (Kyushu) ..... *trifasciatus* FABRICIUS, 1787.
- . On elytra two transverse black bands or roundish spots ..... 38.
38. Elytra pale with two transverse blackish bands (subbasal and preapical), joined by a short stripe running along mid part of suture. Aedeagus as in figs 910, 911. Black spots on pronotum small, roundish, separated. Legs pale with somewhat darkened tarsi. Length 3.5–5.0 mm. Described from Israel. See also subg. *Asionus*, auxiliary group B, antithesis 16) ..... *dinae* LOPATIN et CHIKATUNOV, 2000.
- . On elytra no transverse bands ..... 39.

39. On pronotum two black spots enlarged and prolonged backward, forming longitudinal broad stripes, rarely reduced or almost disappearing. Forms of *decemmaculatus* and *frenatus*, see thesis and antithesis 24.
- On pronotum two black spots free on reddish ground or rarely almost connected with two black spots at hind margin. In the last case reddish ground in the middle of pronotum forms an anchor-shaped pattern ..... 40.
40. Two black spots on pronotum roundish, free, reddish ground in the middle of pronotum does not form an anchor-shaped pattern ..... 41.
- Two black spots on pronotum enlarged, reddish ground in the middle of pronotum anchor-shaped. Black pattern on pronotum and elytra large, sometimes fused, in rare cases expanded on almost entire surfac. General view as in plate XXXVIII, **phot. 335**. Aedeagus not studied. Externally very similar to *tetradecaspilotus* (antithesis 44), but pronotum broader and hind tibiae always straight. Length 3.5–4.6 mm (= *sannio* REDTENBACHER, 1848, *dodecaspilotus* SUFFRIAN, 1854, *interjectus* BALY, 1878, *postunifasciatus* PIC, 1917, *bifurcatus* PIC, 1917, *pygidiomaculatus* PIC, 1928, *lopatianus* MEDVEDEV, 1997). Distributed in Afghanistan, N India, Nepal and Tibet ..... ***triangularis*** HOPE, 1831.



Figs 1596-1603 (1596, 1597 after SASSI 2005; 1598 after MEDVEDEV 1978; 1599, 1600 after MEDVEDEV 1973; 1601-1603 after WARCHALOWSKI 1991): 1603 – pattern on upper side; remaining – aedeagus in dorsal and lateral view: 1596, 1597 – *Cryptocephalus (Cryptocephalus) senegalensis*; 1598 – *C. (C.) acutesternalis*; 1599, 1600 – *C. (C.) tetradecaspilotus*; 1601-1603 – *C. (C.) albolineatus*.

41. Two black spots on pronotum usually fused, forming a common, transverse, bilobed spot. Sutural margin and four large, roundish spots (2, 2) on each elytron black. Length 4.0–4.3 mm. Aedeagus not studied. Distributed in NE Egypt, Sinai Peninsula and Israel ..... ***anastasei*** PIC, 1924.
- Two black spots on pronotum free ..... 42.
42. Body length over 6.0 mm ..... 43.
- Body length under 5.0 mm ..... 44.
43. Body on average larger. Upper side dark red with 10 black spots: on hind part of pronotum two and on each elytron four (2, 2). Legs black, femora basally and tibiae

- red. Punctures of elytra arranged in very regular longitudinal rows. Aedeagus as in figs **1596**, **1597**. Length 7.4–9.0 mm (= *melanostictus* FAIRMAIRE, 1874). Variations: on pronotum two additional black dots behind anterior margin (ab. *kerensis* WEISE, 1901), on each elytron the second pair of spots fused (ab. *mokattamensis* PIC, 1912), both pairs of spots fused (ab. *bisbinterrupta* PIC, 1912). Distributed in equatorial and in north-western Africa from Senegal to Egypt, reported also from Algeria ...  
 ..... *senegalensis* SUFFRIAN, 1857.
- . Body on average smaller. Colouration of body similar as in *senegalensis* (thesis 43). Length 6.0–7.5 mm. Aedeagus not studied. Perhaps a geographical race of *senegalensis* (thesis 43). Distributed in Israel, Jordan and Saudi Arabia .....  
 ..... *egerickxi* TAPPES, 1884.
44. Legs bicolorous: fore legs and mid tibia in proximal part reddish, hind legs and all tarsi blackish. Upper side dark orange, on pronotum two small black dots and on each elytron four (2, 2) small black spots. Aedeagus as in fig. **1598**. Black pattern sometimes partly disappearing. Length 4.0–4.4 mm. Described from Afghanistan ...  
 ..... *acutesternalis* MEDVEDEV, 1978.
- . Legs pale. Pronotum orange with two large roundish spots in anterior part and with two transverse spots fused with hind margin. Externally very similar to *triangularis* (antithesis 40). Elytra dark yellow on each elytron four large (2, 2) spots and one smaller apical spot. General view as in plate XXXVIII, **phot. 336**. Aedeagus as in figs **1599**, **1600**. Length 4.0–4.5 mm (= *duodecatus* FAIRMAIRE, 1889, *fukiensis* PIC, 1954, *kononovi* MEDVEDEV, 1973). Broadly distributed in Russian Far East, China, Japan and Taiwan ..... *tetradecaspilotus* BALY, 1873.

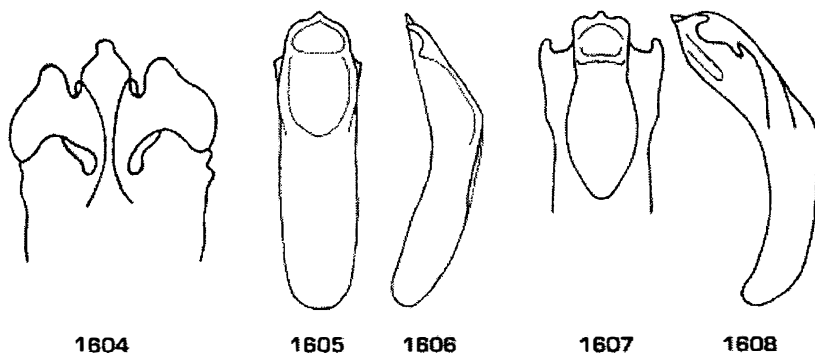
#### Auxiliary group I

Ground colour of elytra black, elytral punctures random.

#### Key to species

1. Head and legs entirely black ..... 2
- . At least fore legs and part of head yellow ..... 7.
2. Upper side black. On pronotum anterior and lateral margins alike a short median stripe pale yellow. On elytron lateral margins, apical spot and a very narrow, long, longitudinal median stripe cream. Aedeagus as in figs **1601**, **1602**. General view as in plate XXXVIII, **phot. 337**. Length 5.2–6.5 mm (= *perrieri* FAIRMAIRE, 1861). Variations: on elytra median stripe absent (ab. *suffriani* SUFFRIAN, 1849), on elytra median stripe shortened (ab. *somi* PIC, 1932), upper side black, lateral margins of pronotum pale yellowish only (ab. *bischoffi* TAPPES, 1869), elytra as in typical form, on pronotum anterior and median stripe absent (ab. *tamaninii* BURLINI, 1955). Alpine species, endemic to western part of Alps ..... *albolineatus* SUFFRIAN, 1847.
- . Pronotum black with lateral borders at least in hind part dark yellow. Elytra black with marginal, apical and longitudinal discal stripe yellow ..... 3.
3. Length over 5.2 mm ..... 4.
- . Length 3.6–4.7 mm. Very similar to previous and by some authors considered as a subspecies of *krutovskyi*, (auxiliary group K, antithesis 4) but much smaller, median

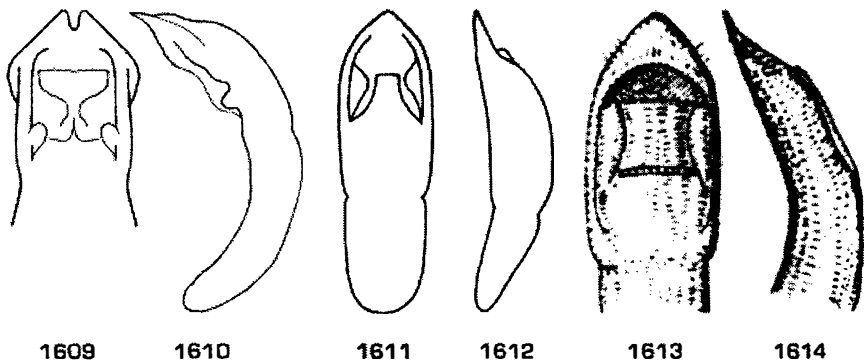
- pattern on pronotum always well-developed. Aedeagus not studied. Distributed in Sakhalin and Japan (Hokkaido) ..... *karafutonis* KONO et TAMANUKI, 1929.
4. Black colour on elytra forms humeral spot or/and longitudinal stripes on brown ground ..... 5.
- On elytra large yellow spots on black ground ..... 6.
5. General view as in plate XXXIX, **phot. 349**. Aedeagus as in fig. **1636**. The darkest forms of *krutovskyi* (auxiliary group K, antithesis 4).
- After descriptions externally similar to darkest forms of *krutovskyi* (auxiliary group K, antithesis 4), aedeagus as in fig. **1604**. Length 5.2–5.5 mm. Variations: pale discal stripe broadened (unnamed), pale discal stripe strongly expanded, black elytral pattern present on anterior part of elytra only (ab. *triangulifer* JACOBSON, 1926). Distributed in N Siberia from N Ural to Magadan Province. An insufficiently studies species, perhaps conspecific or confused with *krutovskyi* (auxiliary group K, antithesis 4) ..... **orotshena** JACOBSON, 1926.



Figs 1604-1608. Aedeagus or its apical half in dorsal and lateral view (1598 after MEDVEDEV 1992; 1605, 1606orig., 1607, 1608 after LOPATIN and DOVGALO 2002): 1604 – *Cryptocephalus (Cryptocephalus) orotshena*; 1605, 1606 – *C. (C.) mannerheimi*; 1607, 1608 – *C. (C.) putjatae*.

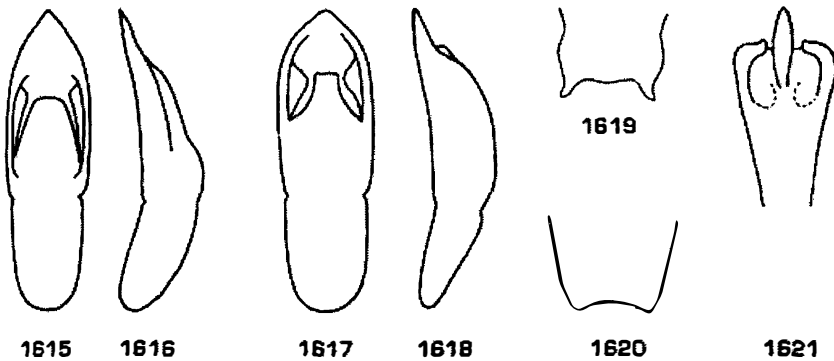
6. On pronotum prescutellar pale spot usually small, sometimes absent. On each elytron usually three pale spots (basal, median and apical), basal spot sometimes absent, median spot usually free. General view as in plate XXXVIII, **phot. 338**. Aedeagus as in figs **1605**, **1606**. In male last abdominal sternite with large impression, without distinct tooth at anterior margin or with a small tubercle only. Length 5.8–8.0 mm (= *immaculatus* BODEMEYER, 1916 nec WESTHOFF, 1882, *infrajunctus* PIC, 1924, *medioflavus* PIC, 1904, *medioniger* PIC, 1904, *ussuriensis* WEISE, 1898). Distributed in Siberia from Altai to Sakhalin, in Mongolia, N China and Korea ....  
..... **mannerheimi** GEBLER, 1825.
- On pronotum prescutellar spot usually large, never absent. Elytra coloured similarly as in *mannerheimi*, but pale median spot broader, formed usually as transverse stripe reaching to lateral margin. In male last abdominal sternite with large impression and with a small tooth in the middle of anterior margin. Aedeagus as in figs **1607**, **1608**. Distributed in Mongolia, Transbaikalia and N China ..... **putjatae** JACOBSON, 1895.

7. At least hind femora blackish ..... 8  
 – Legs entirely pale yellow ..... 12
8. On elytra reddish pattern ..... 9  
 – Elytra black, at least epipleural or subhumeral spot pale ..... 11
9. On each elytron one (apical) or two (epipleural and apical) orange spots ..... 10  
 – On each elytron at least humeral spot and a short transverse band in the middle, usually also apex reddish. Preapical black bands usually fused, therefore hind part of elytra almost entirely black. On pronotum two very large black lateral spots. Apex of aedeagus (figs 1609, 1610) incised. Tibiae reddish, tarsi blackened. Length 5.0–6.2 mm (= *spengleri* FABRICIUS, 1798, *parasiticus* SUFFRIAN, 1854, *piceitarsis* JACOBY, 1903). An Oriental species, known from India, reported also from Afghanistan ..... **vahli** FABRICIUS, 1798.
10. Larger. Clypeus and genae yellowish. Legs relatively dark, hind femora almost entirely black. General view as in plate XXXVIII, **phot. 339**. Head black with labrum, clypeus and genae yellow. Aedeagus as in figs 1611, 1612. Length 3.7–4.8 mm (= *liddesiensis* PIC, 1903). General view as in plate XXXVIII, **phot. 340**. Eight variations were described, the most important are: punctures on elytra strong, on pronotum almost absent (ab. *bosnicus* APFELBECK, 1912), all lateral and anterior margins of pronotum yellow (ab. *trismarginatus* BURLINI, 1967), yellow pattern reduced to little spots in posterior angles of pronotum and on epipleuron (ab. *similis* SUFFRIAN, 1853), apical spot absent (ab. *rhaeticus* STIERLIN, 1863), apical spot absent, epipleural spot present but strongly reduced, frons black (ab. *aethiops* WEISE, 1882). Distributed in Central and North Europe, Scandinavia, Finland, Byelorussia and N Ukraine ..... **quadripustulatus** GYLLENHAL, 1813.
- Smaller. Clypeus and genae black or blackish. Fore tibiae and all knees reddish, remaining external characters as in *quadripustulatus* (thesis 10). General view as in plate XXXVIII, **phot. 340**. Variation: along lateral margins of pronotum run a narrow yellowish stripe (ab. *ochsi* BURLINI, 1955). Length 2.7–4.0 mm. Aedeagus as in figs 1613, 1614. Distributed in W Alps ..... **atrifrons** ABEILLE, 1901.



Figs 1609–1614. Aedeagus in dorsal and lateral view (1609, 1610 after LOPATIN and DOVGAILO 2002; 1611, 1612 after WARCHALOWSKI 1991; 1613, 1614 after BURLINI 1955): 1609, 1610 – *Cryptocephalus (Cryptocephalus) vahli*; 1611, 1612 – *C. (C.) quadripustulatus*; 1613, 1614 – *C. (C.) atrifrons*.

11. Frons black with yellow pattern. Pronotum black, in male anterior and lateral margins, in female lateral margins only yellow. Aedeagus as in figs **988, 989**. Length 2.8–3.4 mm (male) to 3.5–4.2 mm (female) (= *pistaciae* SUFFRIAN, 1853). Variations: in male pronotum black, posterior angles with yellow spot (ab. *deceptor* BAUDI, 1889), in female yellow pattern on frons normal, pronotum and elytra entirely black (ab. *luctuosus* MÜLLER, 1948). Distributed in southern Europe from France to Bulgaria and in Asia Minor ..... **turcicus** SUFFRIAN, 1847.
- Frons entirely black. Melanotic variations of *quadripustulatus* (thesis 10).
12. Pronotum reddish with broad basal black stripe. On elytra black colour forms two transverse bands, sometimes divided into rather large spots. Here colour variation of *tataricus* (auxiliary group G, antithesis 5).
- Pronotum black with yellow marginal stripes ..... **13**.
13. Lateral margins of pronotum black, anterior margin narrowly yellow. Here males of *signatifrons* (auxiliary group G, antithesis 5).
- Lateral margins of pronotum yellow ..... **14**.
14. Frons entirely black. A melanotic variation of *quadripustulatus* (thesis 10).
- On frons yellowish pattern. Yellow part of epipleuron more or less swollen ..... **15**.



Figs 1615-1621 (1615-1618 after WARCHALOWSKI 1991; 1619, 1620 after MATERN and SIEDE 2001; 1621 after MEDVEDEV 1982): 1615-1618 and 1621 – aedeagus in dorsal and lateral view: 1615, 1616 – *Cryptocephalus* (*Cryptocephalus*) *turcicus*; 1617, 1618 – *C. (C.) flavipes*.; 1621 – *C. (C.) pustulipes*; 1619, 1620 – outline of subflagellar plate: 1619 – *flavipes*; 1620 – *C. (C.) bameuli*.

15. Lateral bords of pronotum in both sexes broadly yellow. Upper side black, elytra often with very feeble blue metallic reflex. On pronotum anterior (narrowly) and lateral (broadly) margins yellowish. On elytron a subhumeral spot including epipleuron pale yellowish. General view as in plate XXXVIII, **phot. 341**. Length 3.5–4.8 mm. (= *weisei* REITTER, 1886). Distributed in Syria, Libanon, Jordan, Israel and southern Anatolia ..... **peyroni** MARSEUL, 1875.
- Lateral bords of pronotum in male yellowish, in female pronotum entirely black. Two species very similar to each other, unambiguously distinguishable only by shape of spermatheca and of inner sclerites of aedeagus ..... **16**.

16. In both sexes vertex black, frons almost entirely yellow. General view as in plate XXXVIII, **phot. 342**. Aedeagus as in figs **1617**, **1618**, subflagellar plate as in fig. **1619**. Length 3.2–3.7 mm (male) to 3.5–4.8 mm (female) (= *wydleri* FALDERMANN, 1837, *nigrescens* GRADL, 1881, *dispar* WEISE, 1882). Variations: body smaller, elytral punctures stronger and more confuse than in typical form (ab. *pumilionis* APFELBECK, 1912). Mid legs partly, hind legs entirely black (ab. *obscuripes* WEISE, 1893), in female pronotum with anterior margin yellow (ab. *virago* BURLINI, 1967). Distributed in Europa (except Iberian Peninsula, British Island and northern Scandinavia), Asia Minor, Russia, Caucasian countries and Central Asia to Altai. Here perhaps also *alborzensis* RAPILLY, 1980, described from Iran, with less densely punctured elytra, but without essential differences in external characters or in shape of male and female genitalia ..... *flavipes* FABRICIUS, 1781.
- In female yellow pattern on frons cordiform. Aedeagus as in *flavipes* (thesis 7), subflagellar plate as in fig. **1620**. Here probably dark aberrations described under *flavipes*: head black with two oblong spots on frons (ab. *dispar* WEISE, 1882), in male yellow stripe along anterior margin absent (ab. *nigrescens* GRADL, 1881). Species known from France, Central Europe and Siberia, but its distribution needs a detailed revision ..... *bameuli* DUHALDEBORDE, 1999.

#### Auxiliary group J

Ground colour of elytra pale. Pronotum bicolorous, elytral punctures randomly scattered, legs with spots.

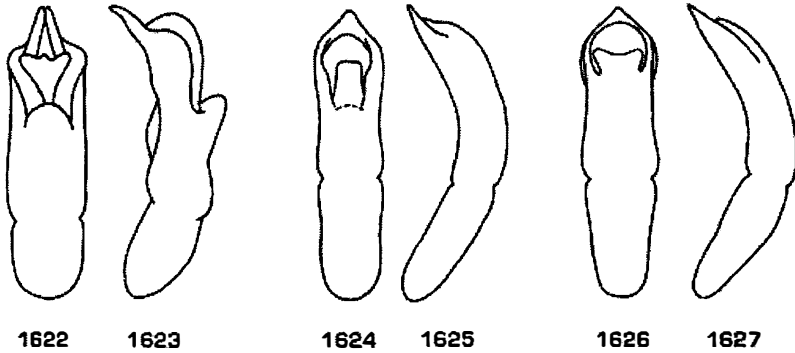
#### Key to species

1. On pronotum in hind part two large, oblique, yellowish spots on black ground, central part before scutellum black, without pale pattern. Elytra red, each elytron with two transverse black stripes (postbasal and postmedian), each stripe in aberrations often divided into two roundish spots. General view as in plate XXXIX, **phot. 343**. Aedeagus as in fig. **1621**. Length 4.5–5.5 mm (= *transversalis* SUFFRIAN, 1853, *confluens* MANNERHEIM, 1853, *muscifer* FAIRMAIRE, 1888, *bisquadrinotatus* PIC, 1902, *kukunorensis* PIC, 1907, *discopallidior* PIC, 1907, *rufotibialis* PIC, 1908). Distributed in Siberia from Altai to basin of Amur, Mongolia, N China and Sakhalin ..... *pustulipes* MÉNÉTRIÉS, 1836.
- On pronotum no two large yellowish spots in hind half .....
2. Lateral flattening of pronotum near posterior angles broad, anteriorly narrow. General view as in plate XXXIX, **phot. 344**. Prescutellar spot on pronotum heart-shaped. Tibiae usually red. Head black with clypeus pale yellow. Pronotum black with yellowish pattern: broad lateral stripes, sometimes interrupted in the middle, a short median stripe in anterior part and with a heart-shaped spot before scutellum. Elytron red, normally with two black spots. Aedeagus as in figs **1622**, **1623**. Length 5.5–6.5 mm (= *vlascanus* PIC, 1910). Variations: on pronotum pale lateral stripe either interrupted, nor narrowed (ab. *completus* JACOBSON, 1901) each elytron with three (1, 2) black spots (unnamed), each elytron with three (2, 1) black spots (ab. *talaris* CSIKI, 1953), hind tibia black (unnamed), on elytron one (humeral) black



spot only (ab. *magistretti* BURLINI, 1948), femora and tibiae black (ab. *nigripes* MÜLLER, 1948), first antennomere and tibiae black, on elytron three (2, 1) black spots (ab. *tihanyensis* SZÉKESY). Distributed from E France and S Sweden to E Siberia ....  
 ..... **cordiger** (LINNAEUS, 1758).

- Lateral flattening of pronotum on whole length broad or at least both lateral margins simultaneously visible in dorsal view. Prescutellar spot of pronotum, when present, never heart-shaped. Tibiae black or dark brown ..... **3**.
- 3. Pronotum distinctly reticulate, silky, punctures a little elongate or longitudinally wrinkled. General view as in plate XXXIX, **phot. 345**. Elytra yellow ochre with black humeral spot, sometimes uniformly coloured. Pronotum black with anterior and lateral margins yellow, sometimes also with a narrow, transverse stripe in posterior part. Aedeagus as in figs **1624, 1625**. Length 5.1–6.0 mm (= *axillaris* CHARPENTIER, 1825). Variations: elytra uniformly yellow ocre (ab. *strasseri* WEISE, 1889), on elytron an additional blackish spot in posterior part (ab. *raccolanae* BURLINI, 1967). Distributed in Central Europe from northern Italy to Thuringia and Silesia .....  
 ..... **variegatus** FABRICIUS, 1781.
- Pronotum shining, elytra red with black pattern ..... **4**.

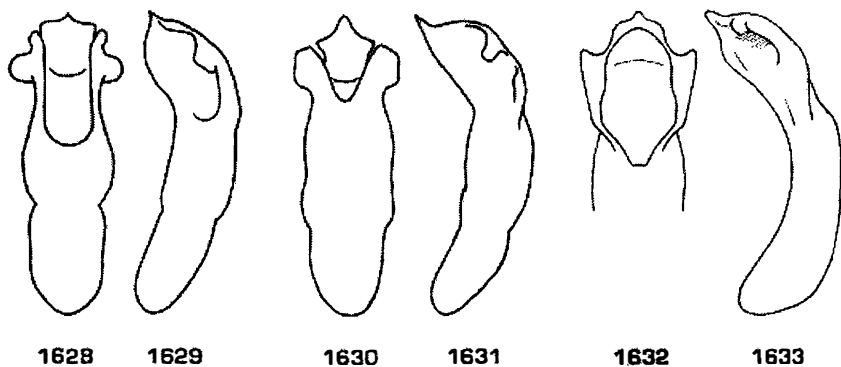


Figs 1622-1627. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1991): 1622, 1623 – *Cryptocephalus (Cryptocephalus) cordiger*; 1624, 1625 – *C. (C.) variegatus*; 1626, 1627 – *C. (C.) quinquepunctatus*.

- 4. Anterior part of epipleura red. Upper side coloured as in *sexpunctatus* (antithesis 5). Aedeagus as in figs **1626, 1627**. Length 4.8–5.7 mm (= *signatus* LAICHARTING, 1781, *interruptus* SUFFRIAN, 1847). About 15 variations were described. The most important forms: on pronotum 5 isolated black dots (ab. *rubellus* WEISE, 1881), on elytra humeral and prescutellar dots only (ab. *ravouxi* PIC, 1911), on elytra external spots only (ab. *biharicus* KASZAB, 1962), on anterior part of elytron humeral spot only, hind stripe interrupted (ab. *vallorbensis* PIC, 1939), both anterior spots fused, hind stripe interrupted (*unifasciatus* TRELLA, 1930), humeral spot free, fore interior elytral spot fused with postmedian spot by a juxtasutural longitudinal black stripe (ab. *tyrolensis* PIC, 1939), as ab. *tyrolensis*, but humeral spot also fused by longitudinal stripe with postmedian spot (ab. *erratus* PIC, 1939). Distributed mainly in central part of Europe,

from north eastern Italy and Belgium to Ukraine .....  
 ..... *quinquepunctatus* (SCOPOLI, 1763).

- Anterior part of epipleura black or at least blackish margined ..... 5



Figs 1628-1633. Aedeagus in dorsal and lateral view (1632, 1633 after LOPATIN and DOVGAILO 2002, remaining after WARCHAŁOWSKI 1991): 1628, 1629 – *Cryptocephalus (Cryptocephalus) octopunctatus*; 1630, 1631 – *C. (C.) sexpunctatus*; 1632, 1633 – *C. (C.) haroldi*.

- 5. Black humeral spot can cover a part of posterior half of humeral callus, but usually whole callus is red. General view as in plate XXXIX, **phot. 346**. Body a little stocky. Aedeagus as in figs **1628, 1629**. Length 5.3–6.2 mm (= *variabilis* SCHNEIDER, 1791, *apotmetus* JAKOBSON, 1900, *colmariensis* PIC, 1918, *diversenotatus* PIC, 1907, *latedeletus* PIC, 1903, *mauriti* PIC, 1927, *multiinterruptus* PIC, 1918, *potaissiae* CSIKI, 1953, *sanguinarius* PIC, 1918, *subhumeralis* PIC, 1918, *variabilis* SCHNEIDER, 1791, *viturati* PIC, 1903). Upper side tricolorous: pronotum black with yellow pattern, elytra red with black spots. Numerous colour variations were described. Distributed in whole Central Europe, alike in France, northern Italy, basin of Danube, Baltic countries and southern Finland ..... *octopunctatus* (SCOPOLI, 1763).
- Black humeral spot covers at least posterior half of humeral callus, but usually whole callus is black. General view as in plate XXXIX, **phot. 347**. Body not stocky. Upper side tricolorous: head black with pale yellow pattern, pronotum and elytra orange with red black pattern as in *quinquepunctatus* (thesis 4). Aedeagus as in figs **1630, 1631**. Length 4.4–5.6 mm (= *separandus* SUFFRIAN, 1847, *thoracicus* WEISE, 1881). About 10 variations were described, the most important forms are: on elytron humeral spot only (ab. *simplarius* HEYDEN, 1884), on elytron two spots in anterior part, behind midlength a short transverse stripe (typical form), prescutellar spots fused with sutural stripe (ab. *pictus* SUFFRIAN, 1847), both anterior elytral spots free, hind stripes joined (ab. *subnigrofasciatus* PIC, 1918), colouration as in ab. *tyrolensis* of *quinquepunctatus* (thesis 4) (ab. *pedemontanus* PIC, 1939), external (humeral and postmedian) elytral spots joined only (ab. *fortinsi* PIC, 1939), a melanotic form: elytra black, on each three reddish spots (prescutellar, central and apical) (ab. *gyllenhali* WEISE, 1881). Distributed mainly in central and northern part of Europe, from

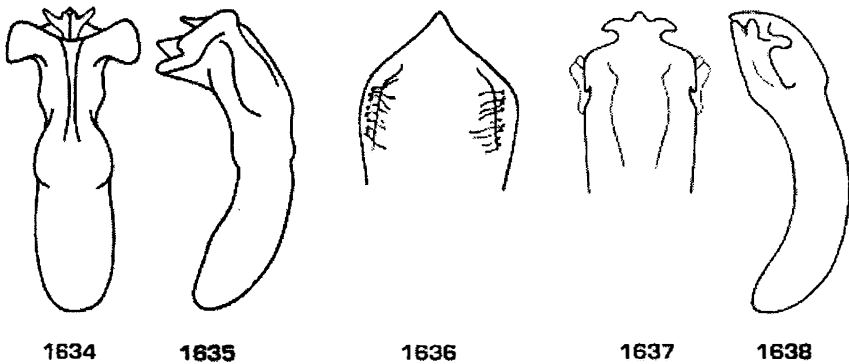
England, eastern France, northern Italy and basin of Danube to the Arctic Circle, in Asia to Mongolia ..... **sexpunctatus** (LINNAEUS, 1758).

Auxiliary group K

Pronotum bicolorous, ground colour of elytra pale, elytral punctures randomly scattered, legs without spots.

Key to species

- 1. Legs black ..... **2.**
- Legs at least partly pale ..... **7.**
- 2. On elytra black colour forms humeral spot or/and longitudinal stripes ..... **3.**
- Black pattern on elytra (sometimes partly disappearing) forms transverse rows of spots ..... **5.**
- 3. Ground of upper side dark yellow or orange. On elytron black longitudinal submarginal stripe running from humerus to apical part. Aedeagus as in figs **1632, 1633**. Length 6.0–8.0 mm. Distributed in E Siberia (basin of Amur and Ussuri and in NE China ...  
..... **haroldi** KRAATZ, 1879.
- Elytra brown or reddish-brown, sutural margins and humeral spot black. On pronotum at least hind part of lateral borders, usually also a median, before scutellum broadened stripe dark yellow or reddish-brown (typical form) ..... **4.**

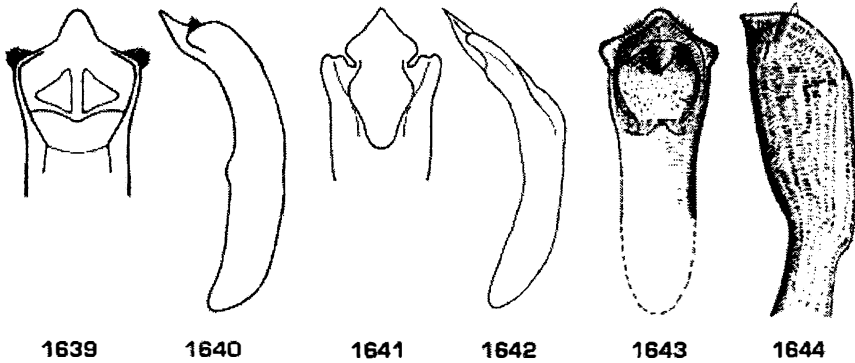


Figs 1634-1638. Aedeagus or its apical part in dorsal and lateral view (1634, 1635 after WARCHAŁOWSKI 1991; 1636 after MEDVEDEV 1982; 1637, 1637, 1638 after LOPATIN and DOVGAILO 2002): 1634, 1635 – *Cryptocephalus (Cryptocephalus) distinguendus*; 1636 – *C. (C.) krutovskyi*; 1637, 1638 – *C. (C.) peliopterus*.

- 4. Middle of pronotum strongly punctured, punctures elongate, ground reticulate, feebly shining. Pronotum black with pale yellowish anterior and lateral margins and with a very narrow transverse stripe before scutellum. General view as in plate XXXIX, **phot. 348**. Legs black. Elytra yellow ochre, on each two black spots and

very narrow sutural stripe. Aedeagus as in figs **1634**, **1635**. Length 5.1–6.0 mm (= *alni* MENÉTRIÉS, 1836). Variations: stripe before scutellum absent (ab. *pomeranicus* BURLINI, 1962), on elytron humeral spot only (ab. *humeralis* SUFFRIAN, 1847), on each elytron three (1, 2) black spots (ab. *subdistinguendus* PIC, 1908), on each elytron four (2, 2) black spots (ab. *bihumeralis* PIC, 1908). Distributed mainly in Scandinavia, northern Russia and Siberia as well in Alps, southern Germany and western part of Carpathians; reported also from different localities in northern Germania, Austria and Czech Republic ..... ***distinguendus*** SCHNEIDER, 1792.

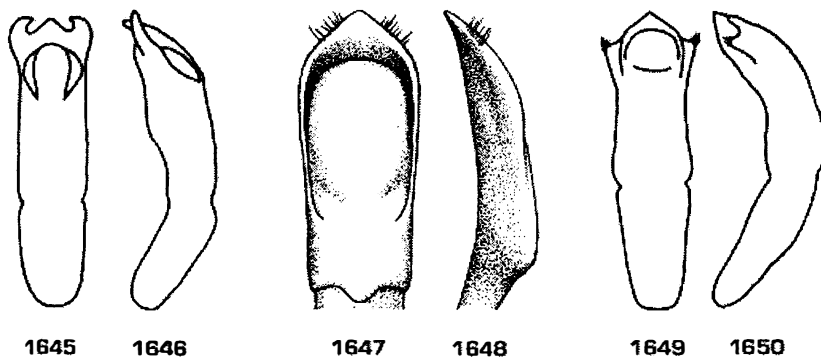
- Middle of pronotum finely punctured, punctures not distinctly elongate, ground shining. Aedeagus as in figs **1636**. Length 5.5–6.5 mm (= *niger* GEBLER, 1830, nec FOURCROY, 1785). Variations: on elytra sutural stripe rather broad, humeral spot prolonged almost to apex (unnamed), as previous, but black submarginal stripe interrupted (unnamed), on pronotum pale median stripe absent, elytra black with marginal, apical and longitudinal discal stripe yellow (melanotic form, unnamed, plate XXXIX, **phot. 349**). Distributed in NE Asia from Altai to basin of Amur, in Mongolia and N China ..... ***krutovskyi*** JACOBSON, 1902.



Figs 1639-1644. Aedeagus or its apical part in dorsal and lateral view (1643, 1644 after BURLINI 1955, remaining after LOPATIN and DOVGAILO 2002): 1639, 1640 – *Cryptocephalus (Cryptocephalus) cruciger*; 1641, 1642 – *C. (C.) multiplex*; 1643, 1644 – *C. (C.) curvilinea*.

- 5. Length of body over 6.5 mm. Pygidium covered by longitudinal rugosities, in female its apex incised. Femora and scutellum always entirely black. General view as in plate XXXIX, **phot. 350**. Aedeagus as in figs **1637**, **1638**, Length 6.5–8.3 mm (= *bivittatus* GEBLER, 1830 nec GYLLENHAL, 1813, *japanus* BALY, 1873, *obliteratithorax* PIC, 1904, *posticedepictus* PIC, 1907, *quadrilineatus* WEISE, 1887, *raddei* KRAATZ, 1879, *raddensis* PIC, 1904 *rosinae* PIC, 1904). Distributed in W Siberia, China and and Japan, reported also from W Siberia ..... ***peliopterus*** SOLSKY, 1872.
- Length of body under 6.2 mm ..... 6.
- 6. W Palaearctic species. Upper side rusty-yellow with black pattern on pronotum and elytra. On elytra black humeral spot and large, common spot covering scutellum and

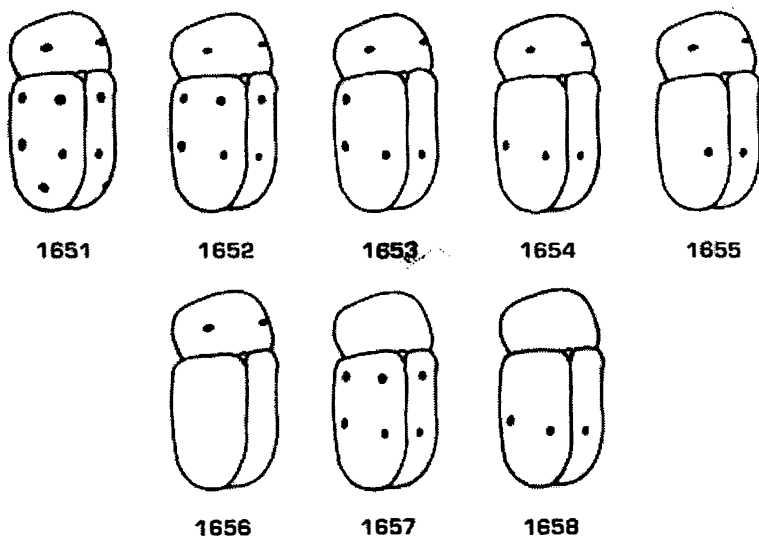
- anterior part of suture as well as two black spots in 2/3 of elytral length. Black pattern sometimes fused in cross-like black pattern. Aedeagus as in figs **1639**, **1640**. Length 4.2–5.2 mm. Distributed in subpolar regions of Europe and of W Siberia ..... **cruciger** HELLÉN, 1922.
- . E Palearctic species. Upper side red with black pattern. General view as in plate XXXIX, **phot. 351**. On pronotum four large black pattern, usually fused longitudinally, before scutellum a short, narrow black stripe. This pattern may be reduced to two small black spots at hind margin of pronotum or expanded; red lateral borders sometimes much paler, yellow. On elytra black pattern less variable, on each elytron almost always two black pattern in anterior part (sometimes fused) and a short, broad, transverse band behind midlength (rarely divided into two spots). Head black with yellow or red clypeus, legs black, on hind and usually also on mid femora pale yellowish or whitish spot. Aedeagus as in figs **1641**, **1642**. Length 4.0–6.4 mm (= *signaticeps* BALY, 1873, *parvicollis* JACOBSON, 1895 nec SUFFRIAN, 1866, *jacobsoni* CLAVAREAU, 1913, *chujoi* NAKANE, 1963). Distributed in China, E Siberia, Korea and Japan ..... **multiplex** SUFFRIAN, 1860.
7. Ground colour of pronotum red brick with yellow pattern. Colouring of upper side and general view as in *muellerianus* (auxiliary group A, thesis 11), but upper side hairless. Aedeagus as in figs **1643**, **1644**. Length 4.2–4.9 mm. Variations: on elytron three (2, 1) dark spots (ab. *inops* WEISE, 1882), on elytron dark humeral spot, remaining spots absent (ab. *carnerii* PIC, 1923). Distributed in Iberian Peninsula, Sicily, Sardinia and northern Africa ..... **curvilinea** OLIVIER, 1808.
- . Pronotum not red with yellow pattern ..... **8**.



Figs 1645-1650. Aedeagus in dorsal and lateral view (1645, 1646 after WARCHAŁOWSKI 1991; 1647, 1648 after PETITPIERRE 2000; 1649, 1650 after WARCHAŁOWSKI 2003): 1645, 1646 – *Cryptocephalus (Cryptocephalus) octomaculatus*; 1647, 1648 – *C. (C.) cynarae*; 1649, 1650 – *C. (C.) biledjekensis*.

8. Pronotum strongly, deeply and very densely punctured. General view as in plate XL, **phot. 352**. Upper side dark yellow or pale reddish, on pronotum two black dots, on each elytron 2–5 black dots. Aedeagus as in figs **1645**, **1646**. Length 4.2–5.6 mm (= *duodecimpunctatus* FABRICIUS, 1792). Variations and their names see caption to figs **1651–1658**. Distributed mainly in southern part of Central Europe, known

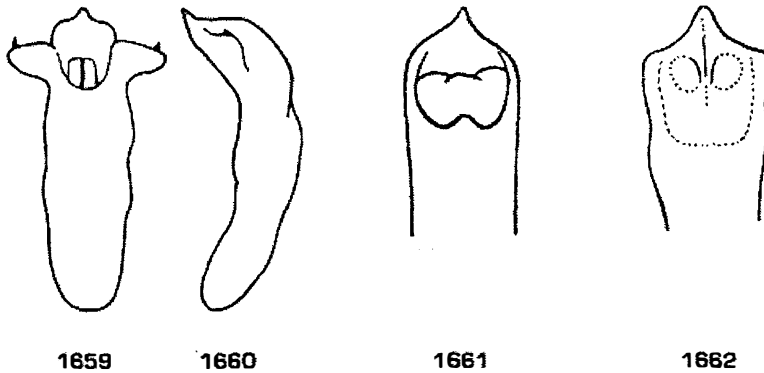
- from southern France, northern Italy, Germany, Poland, basin of Danube and Ukraine ..... *octomaculatus* Rossi, 1790.
- Pronotum finely or at most moderately strongly and not very densely punctured ..... 9
  - 9. Upper side almost entirely orange or reddish, on pronotum two black pots, on each elytron 3 or 5 small black spots ..... 10.
  - Upper side differently coloured ..... 11.
  - 10. On pronotum two small black spots, on each elytron humeral spot and two obliquely placed spots in hind part black. Here pale forms of *vahli* (auxiliary group I, antithesis 9).
  - On pronotum two roundish black spots, on each elytron 5 spots (2, 2, 1). General view as in plate XL, **phot. 353**. Aedeagus as in figs **1647, 1648**. Length 5.0–6.5 mm (= *plagiatus* DES GOZIS, 1907). Distributed in S France, Iberian Peninsula and Balears, newly reported also from Morocco ..... *cynarae* SUFFRIAN, 1847.



Figs 1651-1658 (after WARCHALOWSKI 1991). *Cryptocephalus* (*Cryptocephalus*) *octomaculatus*, variations of pronotal and elytral pattern: 1651 – ab. *duodecimpunctatus* FABRICIUS, 1792; 1652 – typical form; 1653 – ab. *octonotatus* SCHNEIDER, 1792; 1654 – ab. *derivatus* PIC, 1923; 1655 – ab. *volviciensis* PIC, 1923; 1656 – ab. *testaceus* VILLA, 1833; 1657 – ab. *stramineus* SUFFRIAN, 1847; 1658 – ab. *horvathianus* KASZAB, 1962.

- 11. Elytra reddish with two transverse black stripes, anterior stripe often interrupted. Black pattern on upper side similar to *sexpunctatus* (auxiliary group J, antithesis 5). Two species very similar to each other, distinguishable only by shape of aedeagus ..... 12.
- Elytra yellowish or reddish with black spots or longitudinal stripes ..... 13.

12. Aedeagus as in figs **1649, 1650**. Length 5.4–6.8 mm. Distributed in Bulgaria and in western Turkey ..... *biledjekensis* PIC, 1909.
- Aedeagus as in figs **1659, 1660**. Length 5.2–7.1 mm (= *trapezensis* TAPPES, 1871, =? *paradisiacus* WEISE, 1900). Variations: fore coxae with reddish spot (ab. *notaticoxis* PIC, 1923); ab. *syriacus* PIC, 1908 does not differ from typical form. Distributed in western Turkey, northern Syria, Caucasian countries and northern Iran ..... *cribratus* SUFFRIAN, 1847.



Figs 1659-1662. Aedeagus or its apical part in dorsal and lateral view (1659, 1660 after WARCHAŁOWSKI 2003, remaining after MEDVEDEV 1982): 1659, 1660 – *Cryptocephalus (Cryptocephalus) cribratus*; 1661 – *C. (C.) oxysternus*; 1662 – *C. (C.) luridipennis*.

13. Upper side pale, on pronotum two large, roundish spots. Sutural stripe and on each elytron longitudinal submarginal stripe black. General view as in plate XL, **phot. 354**. Length 6.0–7.3 mm. Aedeagus as in fig. **1661**. Variation: submarginal stripe reduced to humeral spot, sutural stripe narrow (unnamed). Distributed in Mongolia, N China and E Siberia ..... *oxysternus* JACOBSON, 1895.
- Upper side pale, on pronotum 5 or 7 black spots, on each elytron four black spots (2, 2). General view as in plate XL, **phot. 355**. Aedeagus as in figs **1662**. Length 3.8–4.7 mm (= *quindecimnotatus* SUFFRIAN, 1854, *muscifer* FAIRMAIRE, 1888, *kiotosinus* PIC, 1908, *bodoi* PIC, 1913, *multicolor* PIC, 1922). Variations: elytra entirely pale (unnamed), black pattern on pronotum expanded, black spots on elytra strongly enlarged and fused (ab. *multiconnexus* PIC, 1908). Distributed from Altai to Korea, in Mongolia, N China, Sakhalin and Japan. In western part of distribution area occurs subsp. *pallescens* KRAATZ, 1879, generally paler coloured (= *chujoi* NAKANE, 1963, *distinctior* PIC, 1908, *kapfereri* PIC, 1913, *serinicolor* PIC, 1907, *signaticeps* BALY, 1873) ..... *luridipennis* SUFFRIAN, 1854.

Subgenus *Disopus* STEPHENS, 1839

The unclear species *C. simoni* WEISE, 1884 described from Spain (= ?*pini*) not included in the key.

Key to species

1. Elytra entirely black or pitchy-brown ..... 2.
- . Elytra yellowish or testaceous. In rare melanotic forms at least apex of elytra remains pale. General view as in plate XL, **phot. 357**. Aedeagus as in figs **1663, 1664**. Length 3.5–4.8 mm (= *porrii* SUFFRIAN, 1847, *laevigatus* Suffrian, 1847). Variations: upper side testaceous, underside blackish (ab. *abietis* SUFFRIAN, 1847), elytra blackish or brown with yellowish apex (ab. *apiceflavus* MÜLLER, 1948). Widely distributed in Europa, from Portugal, Belgium and Norway to western Siberia. The subspecies *guilhemii* SCHAEFER, 1958, described from France is probably only a local form of *pini*, similarly as *simoni* WEISE, 1882 from Spain ..... ***pini*** (LINNAEUS, 1758).
2. Pronotum reddish with irregular, pale, blurred spots in posterior part. Elytra randomly punctured. Underside testaceous. Length of body about 3.5 mm. Distributed in western part of Alps ..... ***tardus*** WEISE, 1888.
- . Pronotum black at most with narrow pale anterior margin. Elytral puncturation arranged in almost regular rows, their intervals sometimes transversely wrinkled. General view as in plate XL, **phot. 358**. Length about 3.7 mm. Described from Japan ..... ***difformis*** JACOBY, 1885.

Subgenus *Heterichnus* WARCHAŁOWSKI, 1991

Literature: WARCHAŁOWSKI 1991.

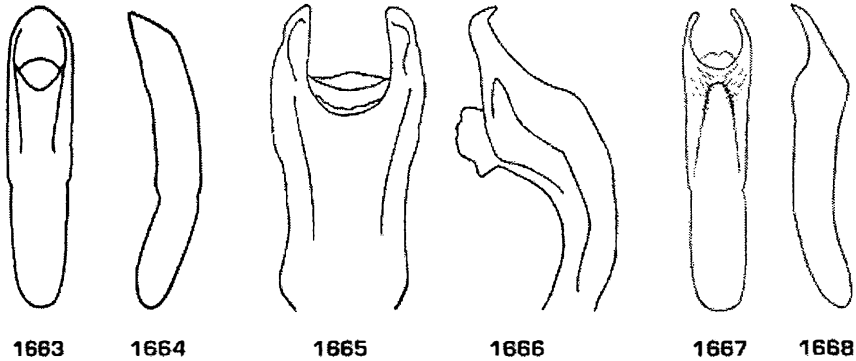
*Homalopus* CHEVROLAT, 1836, nec SOLIER, 1836; *Cryptodontus* BURLINI, 1969 nec MULSANT et REY, 1865 (*Heteroptera*); *Sezerus* ÖZDIKMEN, 2006.

Key to species

1. Upper side with blue or green (more rarely bronzy) metallic shine. In nominotypical subspecies form body usually unicolorous, dark metallic blue, in subspecies and variations elytra partly red and first tarsomere of fore legs (except subsp. *levipes*) very distinctly broadened. General view as in plate XL, **phot. 359**. Aedeagus as in figs **1665, 1666**. Length 5.0–6.0 mm (= *scapulitarsis* JACOBSON, 1894, *dilutipes* JAKOBSON, 1896, *apicimaculatus* JAKOBSON, 1901, *correspondens* JACOBSON, 1901, *alaicus* MEDVEDEV, 1963, *occidentalis* MEDVEDEV, 1963). Forms five subspecies: first tarsomere of fore legs in male not broadened, body relatively small (length 4.0 mm), shape of aedeagus different as in nominotypical subspecies, described from Kirgisia based on one male only, perhaps a distinct species (subsp. *levipes* LOPATIN, 1999), Upper side and legs uniformly metallic, sometimes apical margins of elytra red (nominotypical subspecies from Tian-Shan and S Altai), as nominotypical subspecies, but fore legs reddish (subsp. *cyaneus* BALLION, 1878 from Sinkiang), upper side usually with bronzy shine, on elytra apical part and triangular discal spot red (subsp. *persimilis* LOPATIN, 1956, from Kirgisia), Pronotum with more vivid green



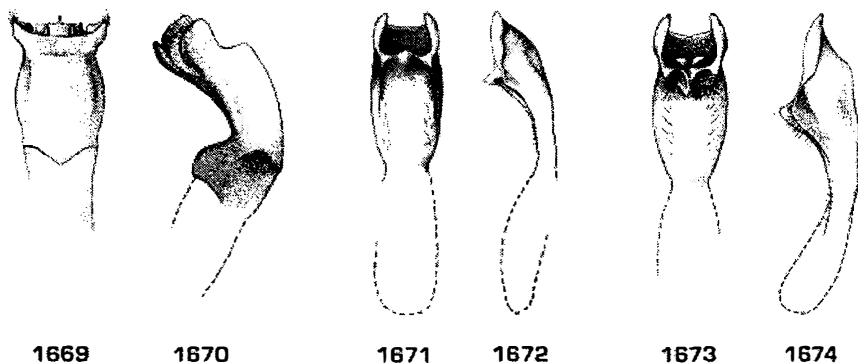
- shine, elytra red with narrow sutural stripe and often with dark spots at scutellum and behind midlength, fore legs or at least tibiae red (subsp. *prosdocetus* JACOBSON, 1898, = *superbus* LOPATIN, 1952, from Ferghanskiy Khrebet and Alaiskiy Khrebet in W Tian-Shan) ..... **macrodactylus** GEBLER, 1830.
- Upper side without metallic shine ..... **2.**
  - 2. Species from Central and E Asia ..... **3.**
  - Species from Europe, Asia minor and Near East ..... **6.**
  - 3. Elytra entirely red or with small blackish pattern. See *coryli* (antithesis 23).
  - Elytra differently coloured ..... **4.**



Figs 1663-1668. Aedeagus in dorsal and lateral view (1663, 1664 after WARCHAŁOWSKI 2003; 1665, 1666 after LOPATIN 1977; 1667, 1668 after WARCHAŁOWSKI 2001): 1663, 1664 – *Cryptocephalus (Disopus) pini*; 1665, 1666 – *C. (Heterichnus.) macrodactylus*; 1667, 1668 – *C. (H.) siedeii*.

- 4. Body black, elytra pale yellowish with very narrow black marginal and sutural stripes and with small, blackish humeral spot. General view as in plate XL, **phot. 360**. Aedeagus as in figs **1667, 1668**. Length 4.3 mm. Described based on one male from N China (Shansi) only ..... **siedeii** WARCHAŁOWSKI, 2001.
- Body differently coloured ..... **8.**
- 5. Body black, elytra reddish with black pattern, legs partly red. See *tarsalis* (thesis 18).
- Body black, on each elytron two large yellow spots. See *nobilis* (thesis 16).
- 6. Scutellum reddish, yellowish or black with a great yellowish spot ..... **7.**
- Scutellum black ..... **16.**
- 7. Pronotum entirely pale yellowish or testaceous ..... **8.**
- Pronotum partly or entirely black, rarely (in *coryli*, antithesis 20) red ..... **9.**
- 8. Length of body 5.5–7.0 mm. General view as in plate XLI, **phot. 361**. Upper side dark yellow or ochraceous, on elytra anterior margin, humeral spot and very narrow sutural stripe black, scutellum sometimes darkened. Underside partly (at least metaepimeres and abdomen) blackish. Legs entirely testaceous. In male hind tibia and hind metatarsus oddly disformed. Aedeagus as in figs **1670, 1671**. Distributed in Spain ..... **podager** SEIDLITZ, 1867.

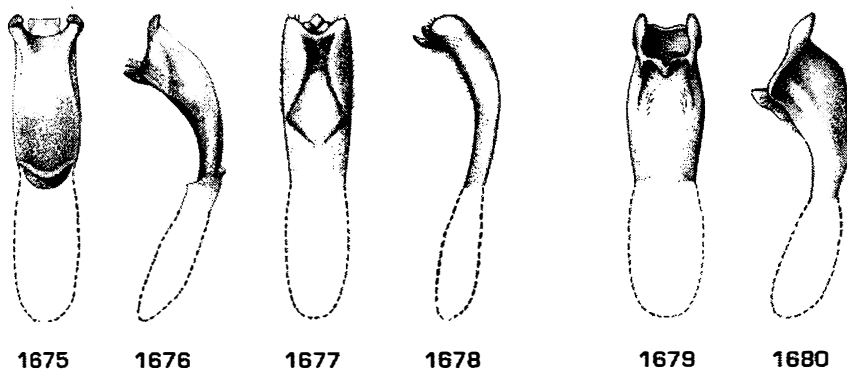
- Length of body not exceeding 5.0 mm. Upper side pale, on each elytron two black spots (humeral and postmedian). Aedeagus as in figs 684, 685. Length 4.0–5.0 mm (= *championi* DANIEL, 1904, nec JACOBY 1880). Distributed in Spain ..... *danieli* CLAVAREAU, 1913.
- 9. Upper side entirely red. A rufinotic form of *coryli* (antithesis 20)
- Upper side with black pattern or almost entirely black ..... 10.
- 10. Elytra entirely black or with reddish apical part. General view as in plate XLI, **phot. 362**. Pronotum black with lateral margins very narrowly yellowish. Aedeagus as in figs 1671, 1672. Length 4.1–5.5 mm (= *gilblas* DEMAUX, 1964). Distributed in Iberian Peninsula ..... *pseudolusitanicus* ARNOLD, 1937.
- Elytra red with black spots or black with reddish pattern also on anterior part .... 11.



Figs 1669-1674. Aedeagus in dorsal and lateral view (after PETTIPIERRE 2000): 1669, 1670 – *Cryptocephalus (Heterichnus) podager*; 1671, 1672 – *C. (H.) pseudolusitanicus*; 1673, 1674 – *C. (H.) lividimanus*.

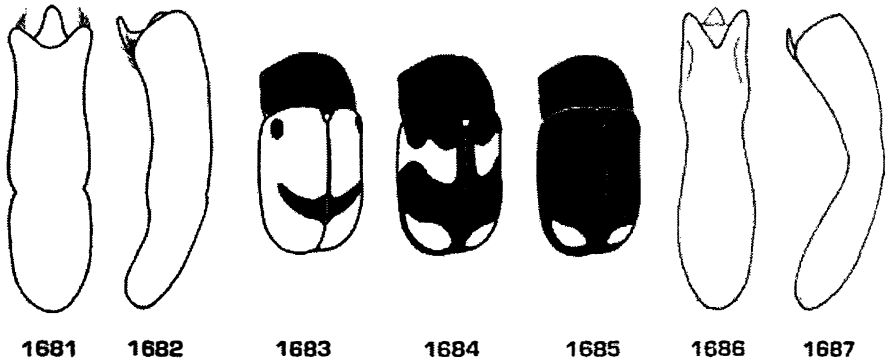
- 11. Elytron with a black humeral spot (rarely with a additional little spot near scutellum) and with two obliquely situated spots behind middle. Pronotum black, anterior and lateral margins narrowly yellowish, often also with two narrow, transverse stripes before posterior margin. Two species from Iberian Peninsula ..... 12.
- Elytral pattern different ..... 13.
- 12. Anterior tarsi and apex of anterior tibia yellowish or orange. General view as in plate XLI, **phot. 363**. Aedeagus as in figs 1673, 1674. Length 5.2–6.5 mm. Variations: on each elytron three black spots, pronotum without yellowish stripes before posterior margin (typical form), on each additionally a littel black spot near scutellum (ab. *albuferanus* PIC, 1908), elytron like in typical form, on pronotum two narrow, transverse stripes before posterior margin (ab. *iberus* PIC, 1908). elytron with two black spots (1, 1) only (ab. *uniobliteratus* PIC, 1913), elytra entirely black (= ab. *inapicalis* PIC, 1908), elytra with reddish apex (ab. *noctifer* PIC, 1900 = ab. *albaracinus* PIC, 1908). Distributed in Iberian Peninsula ..... *lividimanus* KIESENWETTER, 1851.

- Fore legs entirely black. General view as in plate XLI, **phot. 364**. Aedeagus as in figs **706, 707**. Length 5.0–6.7 mm. Distributed in Iberian Peninsula .....  
..... **lusitanicus** SUFFRIAN, 1847.
- 13. Elytra reddish with four relatively great black spots (2, 2). General view as in plate XLI, **phot. 365**. Sometimes posterior, rarely also anterior spots fused into broad, black stripes. Pronotum relatively finely punctate, punctures sometimes longitudinally prolonged, rarely transformed into longitudinal ridges. Aedeagus as in figs **1677, 1678**. Length 3.8–4.6 mm. Distributed in Italy, France and Iberian Peninsula ..... **quadripunctatus** OLIVIER, 1808.
- Elytron black, anteriorly with orange pattern: broad lateral stripe, a great spot on disc and apical part. Lateral stripe usually fused with discal spot, sometimes prolonged and fused also with apical spot ..... **14**.
- 14. Disc of pronotum strongly and deeply punctate, black. General view as in plate XLI, **phot. 366**. Aedeagus as in figs **1679, 1680** (= *erosus* SEIDLITZ, 1867, nec SAUNDERS, 1842). Length 4.5–5.5 mm. Distributed in Spain ..... **excisus** SEIDLITZ, 1872.
- Disc of pronotum finely punctate ..... **15**.
- 15. Disc of pronotum black. General view as in plate XLI, **phot. 367**. Aedeagus as in figs **1681, 1682**. Length 4.5–5.5 mm (= *abietinus* GAUTIER, 1861, *sinuatus* HAROLD, 1872). Variations: pronotum and scutellum entirely black (ab. *atroscutellaris* PIC, 1912), body elongate, punctures of elytra partly arranged in longitudinal rows, punctures of pronotum sparse and partly elongated (ab. *mariei* PIC, 1930). Another variations see figs **1683–1685**. Distributed in southern France, northern Italy, in Alps and in Croatia ..... **carinthiacus** SUFFRIAN, 1848.
- Disc of pronotum black, anteriorly with a median stripe and posteriorly with a median spot reddish or orange. General view as in plate XLI, **phot. 368**. Aedeagus as in figs **1686, 1687**. Length 4.5–5.5 mm. Variation: on pronotum median orange spot absent (ab. *hustachei* PIC, 1909). Distributed in Pyrenees .....  
..... **floribundus** SUFFRIAN, 1866.



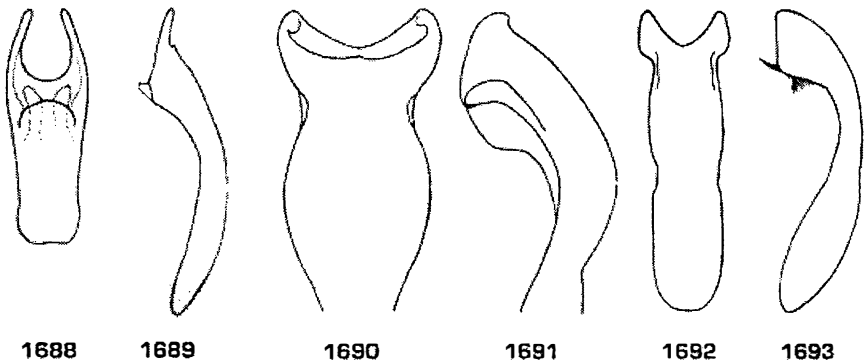
Figs 1675-1680. Aedeagus in dorsal and lateral view (after PETITPIERRE 2000): 1675, 1676 – *Cryptcephalus (Heterichnus) lusitanicus*; 1677, 1678 – *C. (H.) quadripunctatus*; 1679, 1680 – *C. (H.) excisus*.

16. E Palearctic species. Body black, 4–5 basal antennomeres and on each elytron two transverse bands (premedian and preapical) yellow. Legs black. Head entirely black. Lateral borders of pronotum narrow. General view as in plate XLI, **phot. 369**. Aedeagus as in figs **1688**, **1689**. Length 4.9–6.4 mm. Distributed in basin of Amur and Ussuri and in Japan ..... **nobilis** KRAATZ, 1879.
- . W Palearctic species. Colouring of body different. .... **17**.



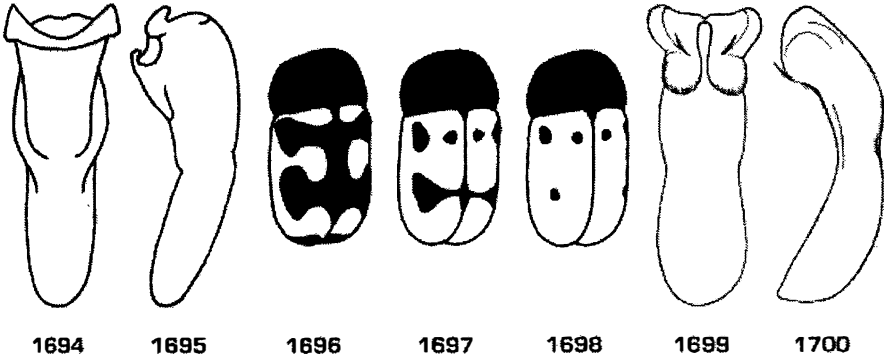
Figs 1681–1687 (after WARCHAŁOWSKI 1991): 1683–1685 variation spectrum, remaining – aedeagus in dorsal and lateral view: 1681–1685 – *Cryptocephalus (Heterichnus) carinthiacus*; 1686, 1687 – *C. (H.) floribundus*.

17. Yellowish stripes at inner margin of eyes absent ..... **18**.
- . Yellowish stripes at inner margin of eyes present ..... **19**.



Figs 1688–1693. Aedeagus in dorsal and lateral view (1688, 1689 after LOPATIN and DOVGAILO 2002; 1690, 1691 after LOPATIN 1977; 1692, 1693 after WARCHAŁOWSKI 2003): 1688–1689 – *Cryptocephalus (Heterichnus) nobilis*; 1690, 1691 – *C. (H.) tarsalis*; 1692, 1693 – *C. (H.) stragula*.

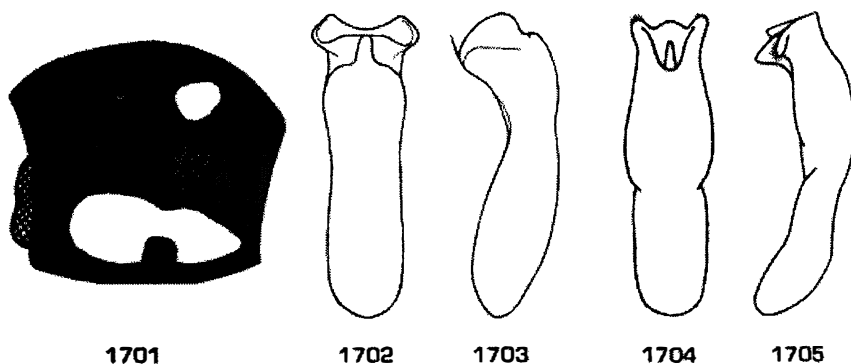
18. Species from Transcaspia, Iran and W China. Head and pronotum black, elytra red with black pattern more or less expanded, usually sutural stripe and two transverse bands black. General view as in plate XLII, **phot. 370**. Aedeagus as in figs **1690, 1691**. In male fore tarsi enlarged, in some specimens strongly, almost conspicuous elongate and broadened. Length 5.5–6.5 mm (= *aksuensis* LOPATIN, 1952, *banghaasi* PIC, 1908, *bisbircruciatu*s PIC, 1907, *kaschgarensis* PIC, 1908, *mouzafferi* PIC, 1907, *nigrescens* JAKOBSON, 1895 nec GRADL, 1881, *nigripes* JAKOBSON, 1895, *subexquisitus* PIC, 1908). Variations: in male fore tarsi reddish (unnamed), black pattern on elytra reduced, elytra uniformly red (unnamed), elytra red with postmedian roundish black spot only (unnamed), body entirely uniformly black (rare form, unnamed). Distributed in great part of Transcaspia from Kopet-Dagh and basin of upper Amu-Daria to NE Tian-Shan and Dzhungaria ..... **tarsalis** WEISE, 1887.
- General view as in plate XLII, **phot. 371**. Pronotum entirely black. Elytra pale yellowish with very broad, posteriorly shortened sutural stripe and with lateral margins narrowly black. Anterior tibiae and tarsi yellow, remaining part of legs dark brown or blackish. Aedeagus as in figs **1692, 1693**. Length 5.0–5.5 mm. Variations: on each elytron yellowish stripe interrupted in the middle (ab. *princeps* ROTTENBERG, 1875), sutural stripe narrowed, on each elytron at scutellum a blackish spot (ab. *anguissolae* LUIGIONI, 1920). Distributed in Italy ..... **stragula** ROSSI, 1794.
19. Pronotum entirely black ..... **20**.
- Pronotum black with yellowish pattern, entirely reddish or reddish with blackish spots ..... **23**.



Figs 1694-1700 (after WARCHAŁOWSKI 1991): 1696-1698 – variation spectrum, remaining – aedeagus in dorsal and lateral view: 1694-1698 – *Cryptocephalus (Heterichnus) loreyi*; 1699, 1700 – *C. (H.) iniformis*.

20. Length of body 7.0–9.5 mm ..... **21**.
- Length of body 5.4–6.5 mm. Here males of *coryli* (antithesis 20).
21. Fore and mid tibiae rather strongly curved apically. Length of body 7.0–8.0 mm. Two species externally similar to each other ..... **22**.

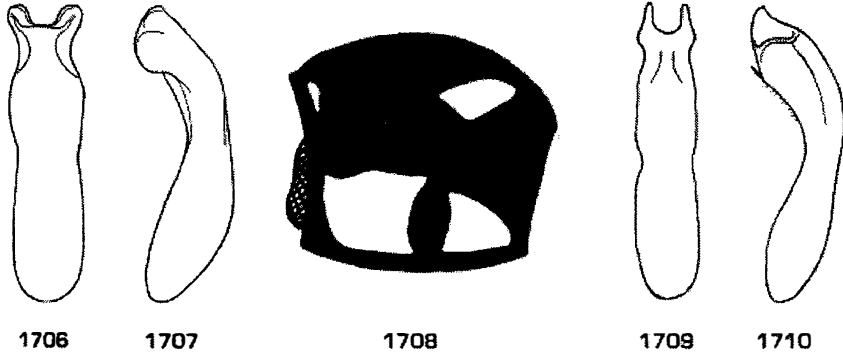
- . Anterior tibiae not distinctly curved. General view as in plate XLII, **phot. 372**. Elytra reddish with black pattern. Aedeagus as in figs **1694, 1695**. Elytron reddish with three black spots (male) or with two transverse black stripes (female). Length 7.5–9.5 mm. Variations (figs **1696–1698**): in female on each elytron three (2, 1) black spots (ab. *gabilloti* PIC, 1908), in male on each elytron three normal spots and additionally a little apical spot black (unnamed), in male on each elytron two black spots (humeral and posterior) only (unnamed), in female on each elytron anterior transverse stripe divided into two spots (ab. *major* COMOLLI, 1837), in female elytron black with two reddish spots (ab. *posticeoculatus* PIC, 1900), in female elytron black with a single median reddish spot (ab. *mediooculatus* PIC, 1931). Distributed in Italy and in southern France ..... **loreysi** SOLIER, 1836.



Figs 1701-1705 (1702, 1703 after Sassi 1997, remaining after WARCHALOWSKI 1991): 1701 – pattern on pronotum in lateral view, remaining – aedeagus in dorsal and lateral view: 1701 – *Cryptocephalus (Heterichismus) informis*; 1702, 1703 – *C. (H.) loebli*; 1704, 1705 – *C. (H.) coryli*.

22. Aedeagus as in figs **1699, 1700**. General view as in plate XLII, **phot. 373**, Pattern on pronotum as in fig. **1701**. Distributed in Apennines and W Alps ..... **informis** SUFFRIAN, 1847.
- . Aedeagus as in figs **1702, 1703**. Endemic to Turkey ..... **loebli** SASSI, 1997.
23. Pronotum black with broad yellowish lateral stripes and with two approximately triangular spots in posterior part ..... **24**.
- . Pronotum differently coloured: entirely red, black with anterior and lateral margins narrowly red, black with a reddish spot at posterior angle or black with reddish margins, spot at posterior angle and additionally with a great reddish spot before scutellum. General view as in plate XLII, **phot. 374**. Usually in male elytra entirely red, pronotum entirely black, in female pronotum and elytra entirely red, scutellum black. Aedeagus as in fig. **1704, 1705**. Length 5.4–6.5 mm (= *vitis* FABRICIUS, 1775). Variations: elytron red with a black humeral spot (ab. *benoiti* PIC, 1900), elytron with two spots: humeral and postmedian (unnamed), on each elytron two (1, 1) black spots (ab. *temesiensis* SUFFRIAN, 1847), on each elytron three (2, 1) black spots (ab. *weiseianus* PIC, 1953), two anterior spots fused (ab. *semiconnexus* PIC, 1900), elytron

with a postmedian spot only (ab. *dorsosignatus* REITTER, 1912), in male pronotum black with a little reddish spot at posterior angle (ab. *franzi*, BURLINI, 1955), in male pronotum black with anterior and lateral margins narrowly red (ab. *brevecinctus* PIC, 1953), in male pronotum black, with anterior and lateral margins narrowly red, with a little reddish spot at posterior angles and with a great reddish spot before scutellum (ab. *curtii* MADER, 1927). Transpalearctic species, distributed from The British Isles to Korea ..... *coryli* (LINNAEUS, 1758).



Figs 1706-1710 (after WARCHAŁOWSKI 1991): 1708 – pattern on pronotum in lateral view, remaining – aedeagus in dorsal and lateral view: 1706-1708 – *Cryptocephalus (Heterichnus) tricolor*; 1709, 1710 – *C. (H.) prusias*.

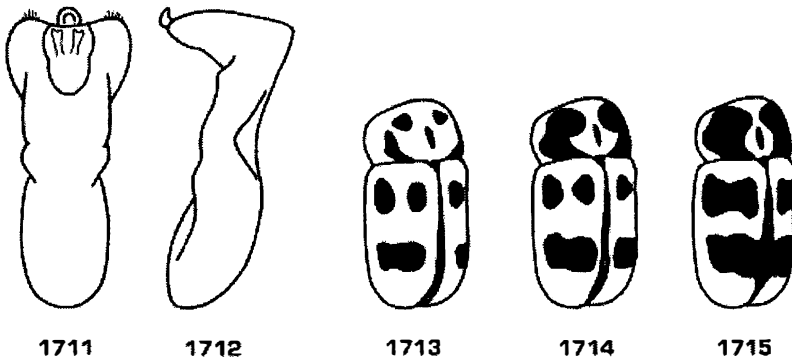
24. On pronotum yellow lateral stripe in the middle interrupted or deeply incised internally (fig. 1708). General view as in plate XLII, phot. 375. Aedeagus as in figs 1706, 1707. Length 6.2–7.3 mm (= *florentinus* OLIVIER, 1808). Variations: yellow lateral stripe on pronotum divided into two spots (typical form), yellow lateral stripe not divided (ab. *bisbinotatithorax* PIC, 1914), on pronotum at anterior margin additionally two little short stripes (ab. *emilianus* PIC, 1914). Distributed in Italy, reported also from Spain and Switzerland ..... *tricolor* ROSSI, 1792.
- On pronotum yellow lateral stripe not interrupted, sometimes shallowly incised externally ..... 25.
25. Species distributed in Europe ..... 26.
- Species from Asia Minor. Pronotum in male entirely black, in female with two oblong-oval yellow spots, lateral and anterior margins dark yellow. Elytra reddish, suture and basal margin black; two roundet spots near base at equal distance from basal margin and a broader postmedian transverse spot, black. Length about 8.0 mm. Described from northern Turkey. Here females of *loebli* (antithesis 19).
26. Species distributed in Italy and in Alps. Colouring of body as in *loebli* (antithesis 16). Length 7.5–8.0 mm. Here females of *informis* (thesis 19).
- Species distributed in eastern part of Balkan Peninsula, Asia Minor and Near East. General view as in plate XLII, phot. 376. Colouring of pronotum similar in both

sexes. Aedeagus as in figs **1709, 1710**. Length 7.0–8.0 mm (= *delagrangei* PIC, 1898, *taurusiensis* PIC, 1898). Distributed in Asia Minor, Syria and Jordan .....  
 ..... **prusias** SUFFRIAN, 1853.

Subgenus **Lamellosus** TOMOV, 1979

Key to species

1. Tooth on apex of fore tibiae smaller, lateroapical borders of aedeagus (figs **779, 780**) not bent ventrally General view as in plate XLII, **phot. 377**. Upper side yellow orange with black spots. Underside and legs black, mid and hind femora often with a yellowish spot. Length 4.0–5.0 mm (= *?rossicus* WEISE, 1900). Variations (figs **1713–1715**): on femora yellowish spot present, pattern on pronotum and on elytra free (typical form), on femora yellowish spot absent, colouring of upper side as in typical form (ab. *nigrofemoratus* BURLINI, 1962), on femora yellowish spot present, on upper side black pattern partly fused as in fig. **1714** (ab. *pseudoviennensis* BURLINI, 1962), on femora yellowish spot absent, colouring of upper side as in ab. *pseudoviennensis* (ab. *viennensis* WEISE, 1882). Aedeagus as in figs **1711, 1712**. Distributed in basin of Danube, Bulgaria, European Turkey, Moldavia, Ukraine and S Russia to basin of Ural. Reported also from NE Italy and Caucasian countries ....  
 ..... **laevicollis** GEBLER, 1830.
- . Tooth on apex of fore tibiae larger, lateroapical borders of aedeagus bent ventrally. Colouring and size of body as in *laevicollis* (= *justinii* PIC, 1910). Known from Asia Minor only. Perhaps a local form of *laevicollis* ..... **angorensis** PIC, 1908.



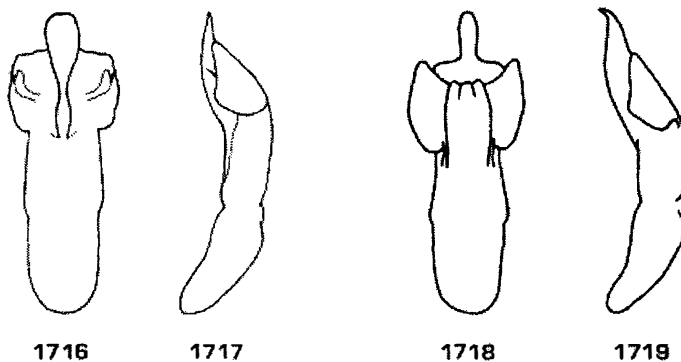
Figs 1711–1715. *Cryptocephalus (Lamellosus) laevicollis* (after WARCHAŁOWSKI 1991): 1711, 1712 – aedeagus in dorsal and lateral view; 1713–1715 variations: 1713 – typical form; 1714 – ab. *pseudoviennensis*; 1715 – ab. *viennensis*.



Subgenus *Protophysus* CHEVROLAT, 1836

Key to species

1. In male hind tibia with a characteristic, great, rhomboidal lamella (plate XIX, **phot. 165**), in female apex of pygidium with a deep incision ..... **2.**
- In male hind tibia without lamella, legs in both sexes blackish with bluish metallic lustre ..... **5.**
2. In male longitudinal ridge on ventral side of abdomen forked at apex, elytra sometimes with reddish apical spot. Aedeagus as in figs **1716**, **1717**. Length about 5.0–5.5 mm. Perhaps identical with *bodemeyeri* WEISE, 1900. Female unknown. Occurs in Asia Minor ..... **wehncke**i WEISE, 1882.  
In male longitudinal ridge on ventral side of abdomen not forked ..... **3.**
3. Legs in both sexes blackish with bluish metallic lustre. In female marginal ridge of elytra at apex usually black. Aedeagus as in figs **1718**, **1719**. Length 5.5–6.5 mm. Variation: in female marginal ridge of elytra at apex reddish, like in typical form of *schaefferi* (thesis 4) (ab. *lantosquensis* PIC, 1908). Distributed in Alps ..... **cyanipes** SUFFRIAN, 1847.
- Legs in female entirely or in the most part orange. In male upper side and legs entirely dark blue, sometimes greenish-black, antennomera 1–4 orange. In female elytron with orange apical spot, usually not separated from margin by blackish marginal ridge ..... **4.**

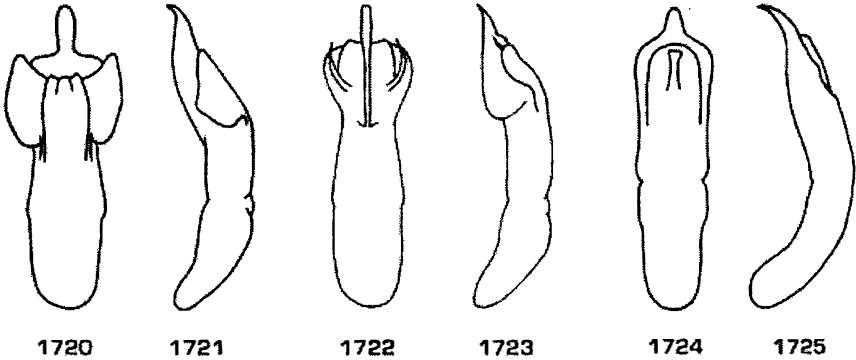


Figs 1716-1719. Aedeagus in dorsal and lateral view (1716, 1717 after SASSI 2000; 1718, 1719 after WARCHAŁOWSKI 1991): 1716, 1717 – *Cryptocephalus (Protophysus) wehncke*i; 1718, 1719 – *C. (P.) cyanipes*.

4. In female incision on apex of pygidium broad. General view as in plate XLII, **phot. 378**. Aedeagus as in figs **1720**, **1721**. Length 5.0–6.2 mm (= *haemorrhoidalis* OLIVIER, 1791, *unicolor* OLIVIER, 1791, *notatus* SCHNEIDER, 1792, *lobatus* FABRICIUS, 1792). Variations: in male upper side black, without metallic lustre (ab. *sabaudus* PIC, 1908), in male elytra with orange apical spot (ab. *gynaecoides* ROUBAL, 1942), elytra

dark blue, pronotum purplish violet (ab. *aubryi* TIBERGHIEU, 1971), in female legs for the most part brown, apical spot separated from margin by blackish marginal ridge (unnamed variation), elytra blue, pronotum green (ab. *pulchrus* TIBERGHIEU, 1971), in female body uniformly black, elytra with a violet sheen (ab. *hungaricus* CSIKI, 1901). Distributed in southern and south-eastern Europa from northern Spain to basin of Volga, in Asia Minor, Caucasian countries and Central Kazakhstan .....

- ..... *schaefferi* SCHRANK, 1789.
- In female incision on apex of pygidium narrow. Length 4.0–5.4 mm (= *bodemeyeri* WEISE, 1900). Distributed in Greece and in Asia Minor, considered often as subspecies of *schaefferi* (thesis 4) ..... *moehringi* WEISE, 1884.



Figs 1720-1725. Aedeagus in dorsal and lateral view (1722, 1723 after SASSI 2000, remaining after WARCHAŁOWSKI 1991): 1720, 1721 – *Cryptocephalus (Protochysus) schaefferi*; 1722, 1723 – *C. (P.) euchirus*; 1724, 1725 – *C. (P.) villosulus*.

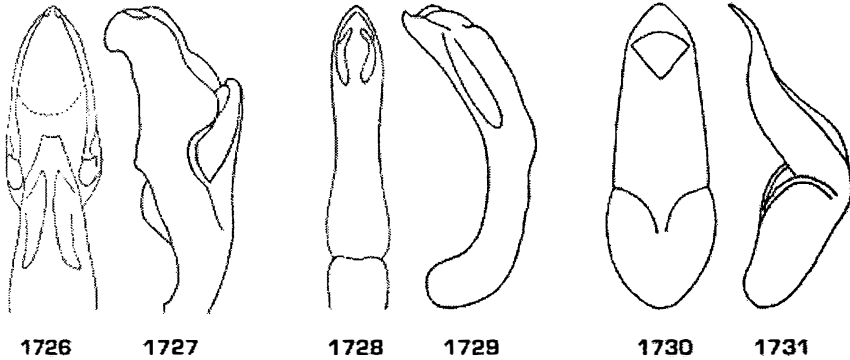
- 5. In female elytra dark blue or greenish-black with reddish apical spot and lateral margins, pygidium with apical incision. Aedeagus as in figs **1722**, **1723**. Length 5.5–6.5 mm (= *obliteratus* OGLONBLIN et MEDVEDEV, 1956). Occurs in northern Iran and in Armenia ..... *euchirus* KRAATZ, 1879.
- In female elytra dark blue or greenish-black with apical spot only, pygidium without apical incision. Aedeagus as in figs **1724**, **1725**. Length 4.2–5.2 mm. Variation: in female elytra unicolorous, without orange apical spot (ab. *inapicipennis* PIC, 1914). Distributed mostly in basin of Danube: Bavaria, Czech Republic, Slovakia, Bulgaria, also in northern Italy and in Dalmatia ..... *villosulus* SUFFRIAN, 1847.

Genus *Jaxartiolus* JACOBSON, 1922

Key to species

- 1. Upper side, except for basal margins of pronotum and elytra, uniformly pale. Puncturation of pronotum dense and strong. Aedeagus as in figs **1728**, **1729**. Length

- 5.0–6.0 mm. Distributed in SE Kazakhstan and in Tian-Shan .....  
 ..... **reductesignatus** LOPATIN, 1976.
- Upper side pale with distinct blackish pattern ..... **2.**
2. Puncturation of pronotum relatively sparse and moderately fine Aedeagus as in figs  
**1726, 1727.** Length 4.0–5.8 mm. Distributed in Transcaspia .....  
 ..... **beckmannianus** JACOBSON, 1922.
- Puncturation of pronotum fine and shallow. Male unknown, aedeagus not studied.  
 Length 4.5 mm. Described from N China (Kansu) based on one female only .....  
 ..... **kozlovi** LOPATIN, 1997.



Figs 1726–1731. Aedeagus in dorsal and lateral view (1730, 1731 after LOPATIN 2005, remaining after LOPATIN 1977): 1726, 1727 – *Jaxartiolus abeckmannianus*; 1728, 1729 – *J. reductosignatus*; 1730, 1731 – *Melixanthus puncticollis*.

Genus *Melixanthus* SUFFRIAN, 1854

Key to species

1. Species from E Palaearctis. Upper side dark green with metallic reflex, ground covered by dense reticulation. Puncturation of pronotum dense, strong and uniformly scattered, primary puncturation of elytra arranged in regular rows. Aedeagus as in figs **1730, 1731.** Described from N China (Kansu), based on one male only .....  
 ..... **puncticollis** LOPATIN, 2005.
- Species from Mediterranean area and Near East. Upper side yellowish, sometimes partly darkened ..... **2.**
2. Pronotum reddish brown with lateral sides and longitudinal median stripe yellowish. Elytra yellowish with longitudinal, blurred stripes along intervals. Length about 2.0 mm. Variations: upper side darkened, yellowish parts reduced (ab. *innesi* Pic, 1900), upper side pale, on elytra dark humeral spots only (ab. *aegyptiacus* Pic, 1900), elytra pale with dark humeral spot and dark sutural stripe in hind part (ab. *luxorensis* Pic, 1916), elytra pale, anteriorly and postmedian with numerous brownish spots (ab. *multimaculatus* Pic, 1916), elytra pale, anteriorly with two dark longitudinal

- stripes and with a spot near hind part of suture (ab. *letourneuxi* PIC, 1916). Described from southern Egypt ..... ***brunnicollis*** (SUFFRIAN, 1857).
- . Pronotum and elytra yellowish without dark pattern, head dark., underside sometimes partly darkened. Length about 2.0 mm (= *granularis* SUFFRIAN, 1857, *jordanicus* LOPATIN, 1979). Variation: sternum black (ab. *atropectoralis* PIC, 1916). Distributed in Egypt, Israel, Libanon, Jordania and Arabia ..... ***melanocephalus*** (SUFFRIAN, 1856).

Genus ***Pachybrachis*** CHEVROLAT, 1837

Literature: BURLINI 1968, LOPATIN 1974a.

Key to subgenera

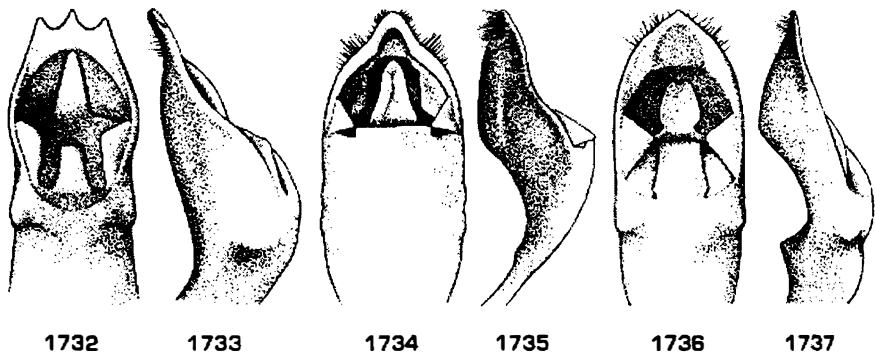
1. Upper side almost entirely green or blue with metallic sheen ..... ***Chloropachys*** (p. 322).
- . Upper side without metallic sheen, usually with black and yellowish pattern, more rarely entirely pure black or entirely yellowish (= *Pachybrachys* REDTENBACHER, 1845, *Pachystylus* REY, 1883, *Homoeostigmus* JACOBSON, 1917) ..... ***Pachybrachis*** s. str. (p. 323).

Subgenus ***Chloropachys*** REY, 1883

The subgenus *Chloropachys* contains 5 species distributed in W Mediterranean area only.

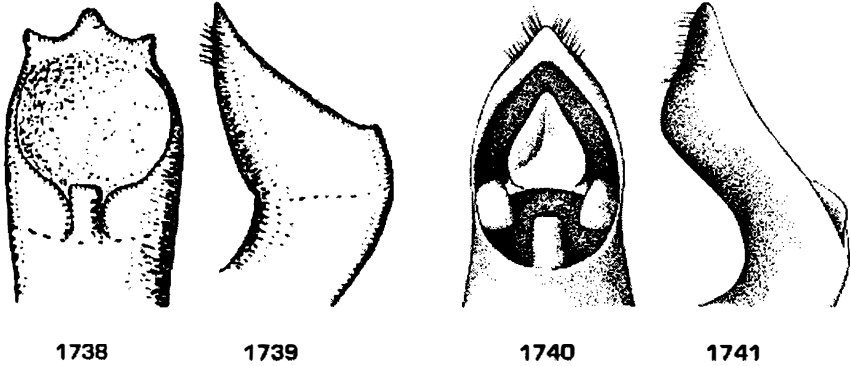
Key to species

1. On elytra external interval at least in hind part yellow, transverse yellow apical stripe present. Aedeagus as in figs 1736, 1737. Length 2.7–3.3 mm. Distributed in southern part of Iberian Peninsula ..... ***regius*** (SCHAUFUSS, 1862).
- . On elytra external interval entirely metallic, transverse yellow apical stripe absent ..... 2



Figs 1732-1737. Apical part of aedeagus in dorsal and lateral view (after PETITPIERRE 2000): 1732, 1733 - *Pachybrachis (Chloropachys) azureus*; 1734, 1735 - *P. (C.) elegans*; 1736, 1737 *P. (C.) regius*.

2. Mid and hind legs entirely or at least partly yellow or reddish. General view as in plate XLIII, phot. 379 ..... **3**.  
 -. Mid and hind legs brown or blackish ..... **4**.  
 3. Aedeagus as in figs 1732, 1733. Length 2.7–3.3 mm. Distributed in Iberian Peninsula and S France ..... *azureus* (SUFFRIAN, 1848).  
 -. Aedeagus as in figs 1738, 1739. Length 2.7–3.3 mm. Distributed in Morocco and Algeria ..... *pici* (CHOBAUT, 1896).



Figs 1738-1741. Apical part of aedeagus in dorsal and lateral view (1738, 1739 after BURLINI 1968; 1740, 1741 after PETITPIERRE 2000): 1738, 1739 – *Pachybrachis (Chloropachys) pici*; 1740, 1741 – *P. (C.) viedmai*.

4. Pronotum rather short and transverse. General view as in plate XLIII, phot. 380. Aedeagus as in figs 1734, 1735. Length 3.3–3.8 mm. Distributed in Iberian Peninsula and Morocco ..... *elegans* (GRAËLLS, 1851).  
 -. Pronotum less short and transverse. Aedeagus as in figs 1740, 1741. Length 3.3–3.8 mm. Distributed in Iberian Peninsula ..... *viedmai* BURLINI, 1968.

#### Subgenus *Pachybrachis* s. str.

The subgenus *Pachybrachis* s. str. contains remaining 132 palaeartic species; upper side very rarely with trace of metallic reflex, never distinctly metallic blue or green.

Not included in the key are: *P. adaliensis* (WEISE, 1886) near *tessellatus* from Turkey, *P. cedri* (PIC, 1898) near *tessellatus* from Algeria and *P. sidonius* from Syria.

#### Key to auxiliary groups

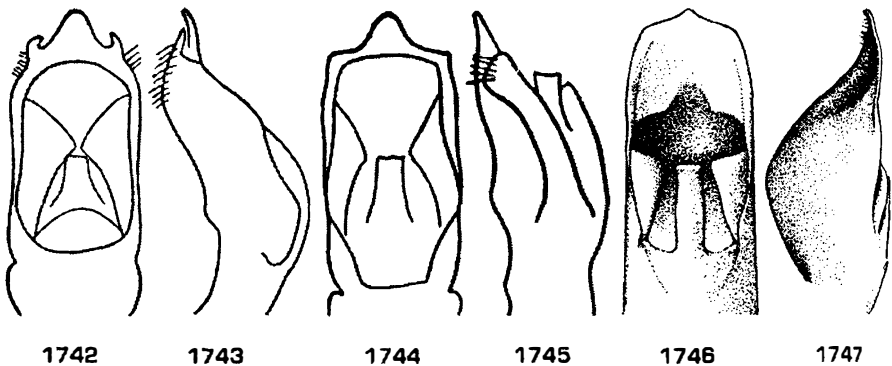
1. Elytra yellowish or testaceous without well-delimited black pattern or with humeral spot only. Punctures often blackish, forming longitudinal, usually partly confuse black lines, in some species confluent, forming blurred blackish spots ..... auxiliary **group A** (p. 324).

- On elytra well-defined black spots on yellow ground or yellow spot or/and stripes on black ground are present, sometimes elytra uniformly black (mainly females and then usually indeterminable) ..... **2**
- 2. Elytra yellow with black pattern, sometimes yellow ground reduced, but not distinctly elevated over surface ..... auxiliary **group B** (p. 340).
- Elytra black with convex yellow spots or stripes elevated over surface, in melanotic specimens uniformly black ..... auxiliary **group C** (p. 355).

Auxiliary group A

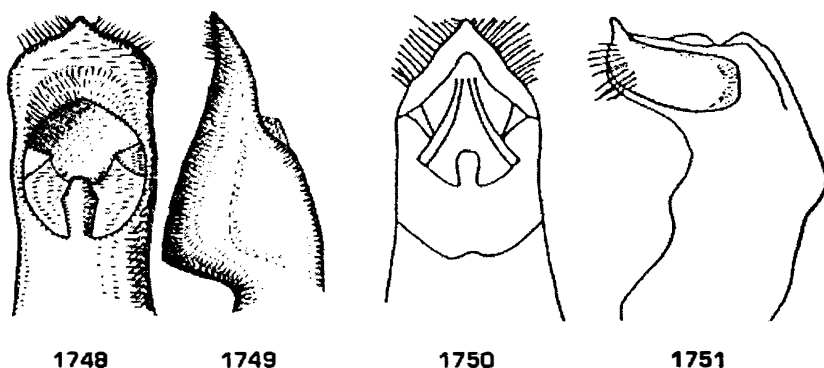
Key to species

- 1. Upper side covered by short, erect hairs ..... **2**
- Upper side bare ..... **4**
- 2. Upper side entirely pale, puncturation brownish. Apical part of aedeagus (figs 1742, 1743) with two small, lateral tooth-like processes. Length 2.8–3.0 mm. Described from NW Kazakhstan ..... **kazakhstanicus** LOPATIN, 1974
- Upper side with blurred pitchy spots ..... **3**
- 3. Underside of apical part of aedeagus (figs 1744, 1745) in lateral view distinctly convex. Length 2.2–2.8 mm. Described from Central Kazakhstan ..... **arnoldii** LOPATIN, 1967.
- Aedeagus in dorsal view shaped similarly as in *altimontanus* (thesis 27), in lateral view feebly convex, almost flat. Length 3.0 mm. Described from Caucasus based on one male only ..... **pubipennis** LOPATIN, 1977.
- 4. Pronotum uniformly pale or with undefined, blurred, brownish darkenings. On elytra punctures usually not blackened, sometimes brownish ..... **5**
- Pronotum with 5 black spots, usually confluent in M-shaped pattern. Elytral punctures blackened, at least in hind half forming parallel, longitudinal lines .... **34**



Figs. 1742-1747. Aedeagus in dorsal and lateral view: 1742, 1743 – *Pachybrachis (Pachybrachis) kazakhstanicus* (after LOPATIN 1977a); 1744, 1745 – *P. (P.) arnoldii* (after LOPATIN 1967); 1746, 1747 – *P. (P.) anoguttatus* (after PETITPIERRE 2000).

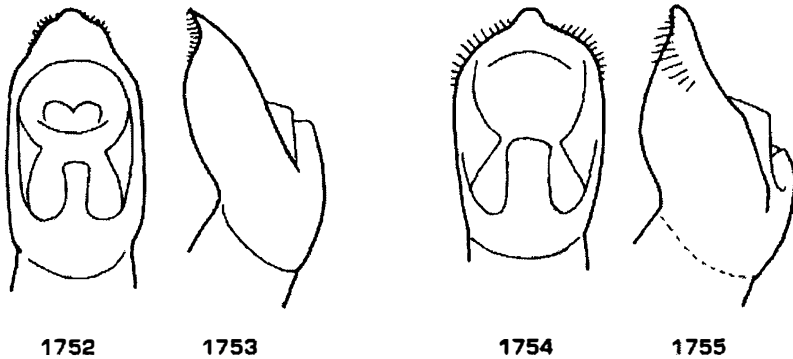
5. W Mediterranean species ..... 6.  
 -. E Mediterranean and Asiatic species ..... 9.  
 6. NW African species. Here two insufficiently studied species described by PIC ..... 7.  
 -. Sardo-Corsican species, very similar to each other, distinguishable only by shape of aedeagus ..... 8.  
 7. On pronotum parallel to basal margin run a narrow, transverse furrow. Externally similar to *vermicularis* antithesis 16. ). Aedeagus not studied. Length 2.5–3.5 mm. Described from N Sahara (Algeria) ..... *sulcithorax* PIC, 1896.  
 -. Pronotum without transverse furrow. Similar to *sulcithorax* (thesis 7) but stronger and more densely punctured. Length 3.5 mm. Insufficiently studied species, described from Morocco ..... *maroccanus* PIC, 1945.  
 8. Ventral convexity of aedeagus (figs 1746, 1747) in lateral view not angulate. Upper side pale, antennomeres 6–11, tarsi and elytral suture more or less darkened. General view as in plate XLIII, **phot. 381**. On underside lateral borders of mesosternum and abdomen partly black. Length 3.0–3.5 mm. Distributed in the Balearic Islands and in Sardinia ..... *anoguttatus* SUFFRIAN, 1866.  
 -. Ventral convexity of aedeagus (figs 1748, 1749) in lateral view angulate. Coloured as *anoguttatus* (thesis 8), but on average slightly larger and darker, on pronotum often with indelined, blurred spots usually fused in M-shaped pattern. Length 2.6–3.8 mm. General view as in plate XLIII, **phot. 382**. Variations: smaller, upper side partly pale (ab. *riguus* MARSEUL, 1875), larger, underside entirely blackish except for mesoepimeres and apical margin of abdomen (ab. *paganettii* PIC, 1935, perhaps belonging to *anoguttatus*, thesis 8). Distributed in Sardinia and Corsica ...  
 ..... *testaceus* PERRIS, 1865.



Figs. 1748-1751. Aedeagus in dorsal and lateral view: 1748, 1749 – *Pachybrachis (Pachybrachis) testaceus* (after BURLINI 1968); 1750, 1751 – *P. (P.) Pachybrachis (Pachybrachis) freidbergi* (after LOPATIN 1994).

9. Elytral punctures on whole surface arranged in regular or only very weakly confuse rows ..... 10.  
 -. Elytral punctures at least on anterior half randomly scattered ..... 11.

10. Pronotum strongly and densely punctured. Length 3.2 mm. Aedeagus as in figs **1750, 1751**. Described from Israel, based on one male only ..... *freidbergi* LOPATIN, 1994.
- . Pronotal puncturation moderately strong and dense. General view as in plate XLI-II, **phot. 383**. Aedeagus as in figs **1752, 1753**. Length 3.5–4.0 mm (= *transcaspicus* BREIT, 1921). Distributed in Central Asia, Iran, Caucasian countries and Near East ..... *glycirrhizae* OLIVIER, 1808.
11. Frons broad, distance between upper lobes of eyes not smaller than distance between anterior margin of clypeus and centre of frons ..... **12**.
- . Frons narrower, distance between upper lobes of eyes smaller than distance between anterior margin of clypeus and centre of frons ..... **17**.
12. Pronotum not particularly short and broad, upper side with blurred, undefined, brownish spots or stripes. Puncturation of elytra almost entirely random, traces of semiregular rows along lateral sides only ..... **13**.
- . Pronotum short and broad, elytra uniformly pale ..... **16**.
13. Smaller species. Colouration of body as in *caprea* (thesis 15). Aedeagus as in figs **1754, 1755**. Length 2.6–3.0 mm. Described from Tibet ..... *hauseri* PIC, 1907.
- . On average larger species ..... **14**.

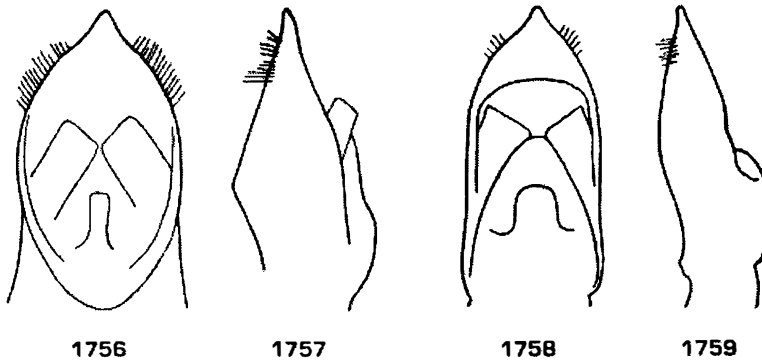


Figs. 1752-1755. Aedeagus in dorsal and lateral view: 1752, 1753 – *Pachybrachis (Pachybrachis) glycirrhizae* (after BREIT 1921); 1754, 1755 – *P. (P.) hauseri* (after BREIT 1921).

14. Species described from Tibet based on one specimen only (sex not determined), coloured as *hauseri* (thesis 13), but brown stripe on elytron shortened. Length 3.2 mm. Perhaps conspecific with *hauseri* ..... *tibetanus* GRESSIT et KIMOTO, 1961.
- . Species from Transcaspia ..... **15**.
15. Aedeagus as in figs **1758, 1759**. Length 2.8–4.5 mm. Upper side brownish, pronotum usually darker than elytra, sometimes blackish, its anterior and lateral borders pale, weakly delimited. Elytra dark yellowish with longitudinal brown median stripe, often broadened and covering almost whole surface except for lateral margins. Distributed in Transcaspia, approximately from Karatau Mountains to lake Zaisan ... *caprea* WEISE, 1916.



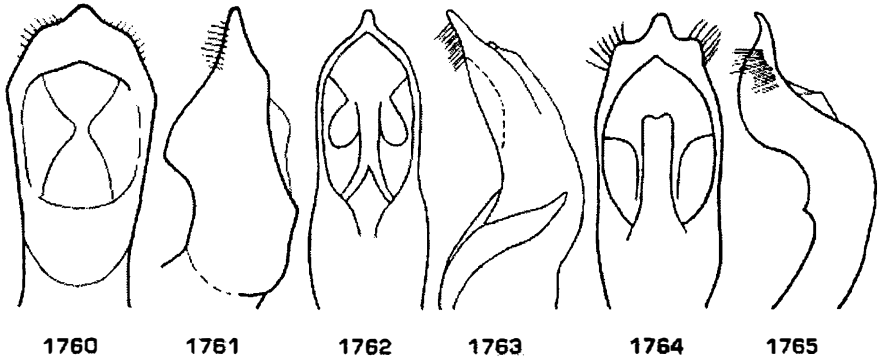
- Aedeagus as in *caprea* (thesis 15). Length 3.7 mm (male) to 4.0 mm (female). Described from Turkmenistan. Perhaps conspecific with *caprea* (thesis 15) ..... ***kaplini*** LOPATIN, 1986.
- 16. Puncturation of pronotum irregular, random, fine and very dense. Shape of aedeagus similar as in *absinthii* (thesis 33). Length 2.5–3.8 mm. Distributed in E Kazakhstan and NW China ..... ***auliensis*** BREIT, 1921. Puncturation of pronotum less dense, uniformly scattered. Aedeagus as in figs **1760, 1761**, narrowed before apical part. Upper side entirely pale, 5 or 6 last antennomeres slightly darkened, rarely brown. Underside blackish, mesoepisterna and hind borders of abdominal sternites dark yellow. Pygidium black, its hind part yellow. General view as in plate XLIII, **phot. 384**. Length 2.4–3.5 mm (= *astragali* STIERLIN, 1863). Variations: on pronotum blurred, brownish spots, underside black, only mesoepimeres and margin of last abdominal sternite pale (typical form), pronotum and pygidium entirely yellowish, underside pale with darkenings on meso- and metasternum (ab. *pallidiventris* JACOBSON, 1894). Distributed in S Russia, Caucasian countries and Iran ..... ***vermicularis*** SUFFRIAN, 1854.



Figs. 1756-1759. Aedeagus in dorsal and lateral view: 1756, 1757 – *Pachybrachis (Pachybrachis) glycirrhizae* (after BREIT 1921); 1758, 1759 – *P. (P.) caprea* (after LOPATIN 1977).

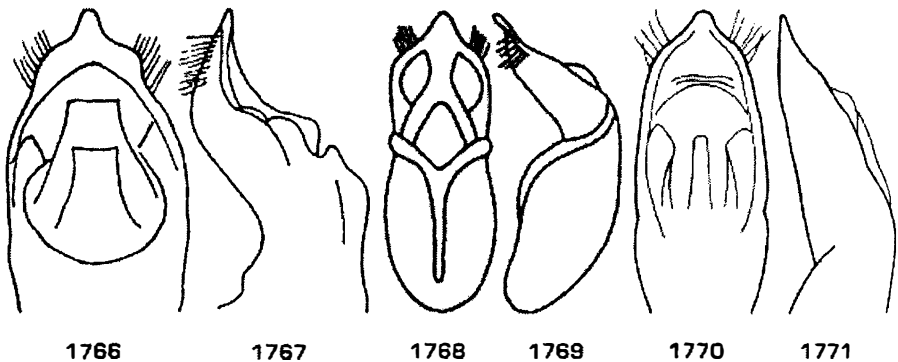
- 17. On average smaller species (2.5–3.5 mm), puncturation of elytra fine or moderately fine ..... **18**.
- On average larger species (3.0–5.0 mm), puncturation of elytra strong ..... **25**.
- 18. Pronotum transverse, less convex, about 1.7 × broader than long. Upper side uniformly yellowish, punctures on elytra brownish. Aedeagus similarly shaped as in *kirghizicus* (antithesis 23), its underside in lateral view gently convex. Length 2.5–3.0 mm. Distributed in E Kazakhstan (valley of the river Charin) ..... ***skopini*** LOPATIN, 1967.
- Pronotum less transverse, about 1.2–1.5 × broader than long. Here five small species, with rather similar shape of aedeagus ..... **19**.
- 19. Puncturation of elytra entirely random, upper side uniformly yellowish. Abdomen black, broadly bordered with yellow, pygidium yellow, its base black. Aedeagus as

in figs 1762, 1763, Length 3.0 mm. Described from Kyrgyzstan based on one male only ..... **additus** LOPATIN, 1991.  
 -. Not as above ..... 20.



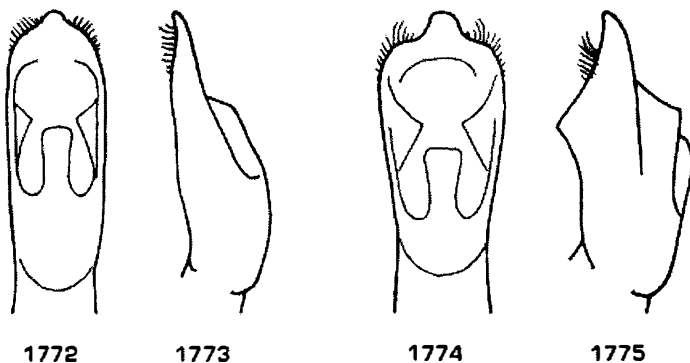
Figs. 1760-1765. Aedeagus in dorsal and lateral view: 1760, 1761 – *Pachybrachis (Pachybrachis) vermicularis* (after BREIT 1921); 1762, 1763 – *P. (P.) additus* (after LOPATIN 1991); 1764, 1765 – *P. (P.) rufescens* (after LOPATIN 1974).

20. Upper side dark yellowish ochraceous, on head and pronotum undefined, very pale brownish pattern, puncturation on elytra black, here and there confluent and forming short stripes. Puncturation of pronotum deep, in hind part less densely scattered. Lamella on apex of aedeagus as in figs 1764, 1765, bent down. Length about 3.0 mm. Described from Kazakhstan (Tshimkent distr.) ..... **rufescens** LOPATIN, 1974.  
 -. Upper side paler, yellow or greenish-yellow. Vertex and frontal stripe black .... 21.



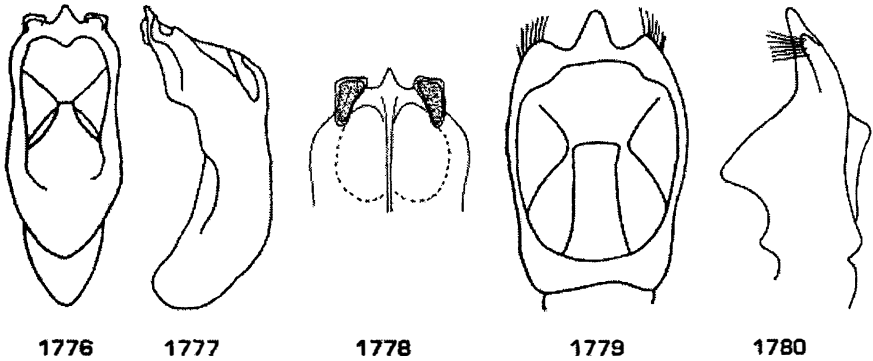
Figs. 1766-1771. Aedeagus in dorsal and lateral view: 1766, 1767 – *Pachybrachis (Pachybrachis) marki* (after LOPATIN 1997); 1768, 1769 – *P. (P.) semidesertus* (after LOPATIN 1994); 1770, 1771 – *P. (P.) kirghizicus* (after LOPATIN 1974).

21. Apex of aedeagus with large lamella ..... **22.**  
 - Apex of aedeagus with small lamella ..... **23.**
22. Smaller. Similar to *rufescens*, (thesis 20), but upper side paler coloured and finer punctured. Aedeagus as in figs **1766, 1767**. Length 2.8 mm. In original description is mentioned a form with small, but distinct blackish spots on elytra as in auxiliary group B. Described from Tadzhikistan, based on two males only .....  
 ..... **marki** LOPATIN, 1997.  
 - Larger. Externally similar to *marki* (thesis 22). Aedeagus as in figs **1768, 1769**. Length 3.2 mm. Described from W Kazakhstan (near lake Inder, valley of Low Ural) .....  
 ..... **semidesertus** LOPATIN, 1994.
23. Pronotum strongly, deeply and densely punctured, interstices narrower than diameter of punctures ..... **24.**  
 - Pronotum moderately strongly punctured, interstices as broad or broader than diameter of punctures. Aedeagus as in figs **1770, 1771**. Length 3.0–3.5 mm. Forms two subspecies: body more slender, elytra moderately strongly punctured, punctures in hind and lateral part arranged in longitudinal, regular or semiregular rows (nominotypical subspecies); body more stout, punctures on elytra more randomly scattered (subsp. *salsolae* LOPATIN, 1974). Distributed in Kyrgyzstan: subspecies *kirghizicus* s. str. in vicinity of the lake Issyk-Kul, subsp. *salsolae* in Tian-Shan ...  
 ..... **kirghizicus** LOPATIN, 1974.
24. Aedeagus as in figs **1772, 1773**, more slender, underside in lateral view almost flat. Larger, length 2.5–3.6 mm. Distributed in SE Kazakhstan ..... **cribricollis** PIC 1907.  
 - Aedeagus as in figs **1754, 1755**, thick and short, underside in lateral view convex. See *hauseri* (thesis 13).
25. Ventral side of abdomen with broad yellow borders ..... **26.**  
 - Yellow border on anal sternite only ..... **31.**
26. Outline of body shorter, ratio length/breadth of elytra under 1.5. General view as in plate XLIII, **phot. 385**. Aedeagus as in figs **1774, 1775**. Length 3.0–4.0 mm. Described from Uzbekistan ..... **curtipennis** BREIT, 1921.  
 - Body more elongate, ratio length/breadth of elytra more than 1.6 ..... **27.**



Figs. 1772-1775. Aedeagus in dorsal and lateral view: 1772, 1773 – *Pachybrachis (Pachybrachis) cribricollis* (after BREIT 1921); 1774, 1775 – *P. (P.) curtipennis* (after BREIT 1921).

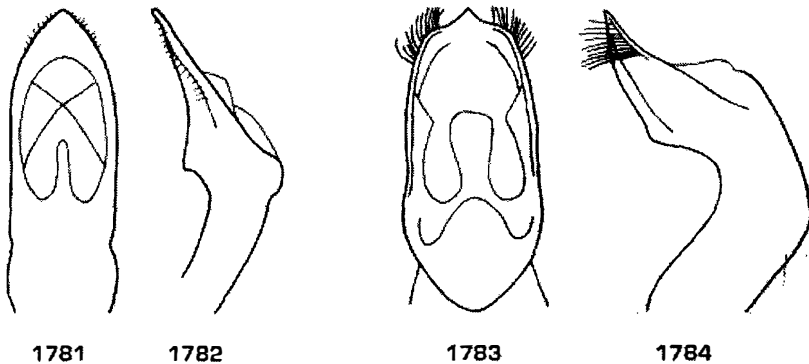
27. Upper side strongly, not very densely punctured, aedeagus without conspicuous process at apex ..... 28.
- . Upper side rather densely and finely punctured. Apex of aedeagus (figs 1776–1778) with central triangular lamella and two short, broad, conspicuous processes laterally. Length 3.3 mm. Described from Mongolia, based on one male only ..... *gobicus* LOPATIN, 1977.
28. Aedeagus (figs 1779, 1780) with a large lamella on apex, in lateral view with strong, almost angulate convexity on ventral side. General view as in plate XLIII, **phot. 386**. Length 3.0–5.0 mm. Rather broadly distributed from Syria and Caucasian countries to N Iran and Afghanistan ..... *nigropunctatus* SUFFRIAN, 1854.
- . Apex of aedeagus without or with a small lamella ..... 29.



Figs. 1776-1780 (after LOPATIN 1977): 1778 – Apex of aedeagus in ventral view, remaining – aedeagus in dorsal and lateral view: 1776-1778 – *Pachybrachis (Pachybrachis) gobicus*; 1779, 1780 – *P. (P.) nigropunctatus*.

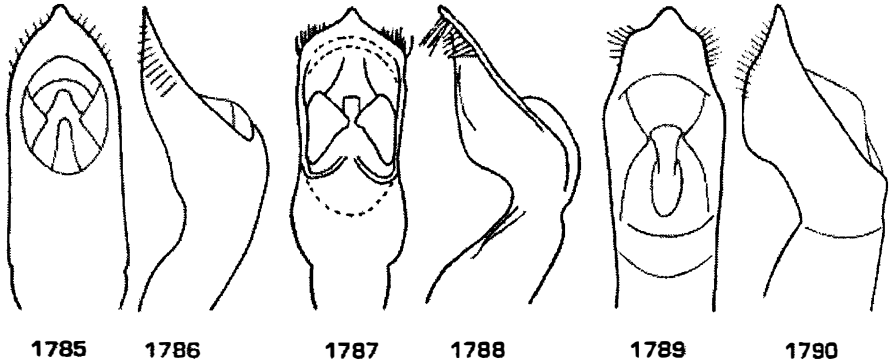
29. Apex of aedeagus with a small lamella, apical half in lateral view gently convex, not angulate ..... 30.
- . Apex of aedeagus (figs 1781, 1782) without lamella, gently narrowed and rounded. Upper side and legs pale, last 2–3 antennomeres, vertex and claws pitted or black. Externally similar to *nigropunctatus* (thesis 28), but elytra more finely and more randomly punctured. General view as in plate XLIII, **phot. 387**. Length 3.2–4.4 mm. Distributed in SE Kazakhstan ..... *pistor* BREIT, 1921.
30. Body length 3.8–4.5 mm ..... 31.
- . Body length under 3.8 mm ..... 33.
31. Humeral calli long, convex. Upper side covered by deep, rather strong punctures, of similar size on pronotum and elytra. Elytral punctures in scutellar area random and dense, along lateral sides and in apical half more loosely scattered and arranged in subregular rows. Aedeagus as in figs 1783, 1784. Length of body 3.8–4.0 mm. Described from NW China ..... *jastschenkoi* LOPATIN, 1995.
- . Humeral calli gently convex, not elongate ..... 32.

32. Upper side pale greenish-yellow. Elytral puncturation rather fine and dense, punctures barely stronger than on pronotum. Apex of aedeagus (figs 1789, 1790) narrowed and elongate. Length about 4.0 mm. Described from Kazakhstan (Dzhambul). Considered as subspecies of *issykensis* (antithesis 32), but most probably a distinct species ..... ***laevigatus*** BREIT, 1921.
- Elytral puncturation stronger and less dense. Apex of aedeagus (figs 1791, 1792) shorter. Length 3.8–4.5 mm. Forms two subspecies: on elytra short stripes formed from fused blackish punctures (nominotypical subspecies), upper side without black markings, brightly yellow ochraceous (subsp. *gussakovskii* LOPATIN, 1968). Distributed in Kyrghyzstan (*issykensis* s. str.) and Tadzhikistan (subsp. *gussakovskii*) ..... ***issykensis*** JACOBSON, 1901.
33. Body short and stout, elytra almost square, entirely randomly punctured Aedeagus as in figs 1785, 1786. Length about 3.5 mm (male) to about 3.7 mm (female). Described from Dzhungarskiy Alatau mountains, distr. Kizilagash, SE Kazakhstan ... ..... ***absinthii***, LOPATIN, 1990.
- Body not very stout, elytra longer than broad. Aedeagus as in figs 1787, 1788. Length 3.4 mm (male) to 3.8 mm (female). Described from Anatolia (Turkey) ..... ***anatolicus*** LOPATIN, 1985.
34. W Mediterranean species ..... **35.**
- E Mediterranean and Asiatic species ..... **48.**
35. Lateral side of apical part of aedeagus (figs 1793, 1794) strongly tooth-like angulate. General view as in plate XLIV, phot. 388. Colouring of body as in *P. scriptus* (thesis 39). Mesoepimeres yellowish. Pigidium usually black, without pale spots, at least in male. Length 2.5–3.5 mm. Distributed in Iberian Peninsula ..... ***lineolatus*** SUFFRIAN, 1848.
- Apex of aedeagus obtuse, rounded or slightly angulate ..... **36.**
36. Apex of aedeagus (figs 1795, 1796) obtusely cut with rounded lateral angles and with large median lamella. Head testaceous with black pattern composed of two dots situated near antennal insertions, a longitudinal stripe on frons and a trans-



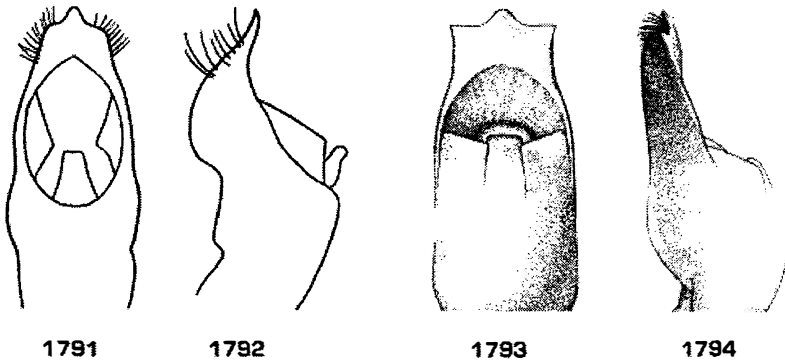
Figs. 1781-1784. Aedeagus in dorsal and lateral view: 1781, 1782 – *Pachybrachis (Pachybrachis) pistora* (after LOPATIN 1991); 1783, 1784 – *P. (P.) jastschenkoi* (after LOPATIN 1995).

- versal stripe on vertex. Mesoepimeres flavous. Pygidium black with a kidney-shaped flavous spot. Length 2.6–2.9 mm (male) to 3.4–3.6 mm (female). Known only from Isole Pontiane (Italy, near Naples) ..... *burlinii* DACCORDI et RUFFO, 1971.
- Apex of aedeagus laterally rounded or slightly angulate ..... 37.
  - 37. Apex of aedeagus laterally rounded ..... 43.
  - Apex of aedeagus obtusely angulate ..... 38.



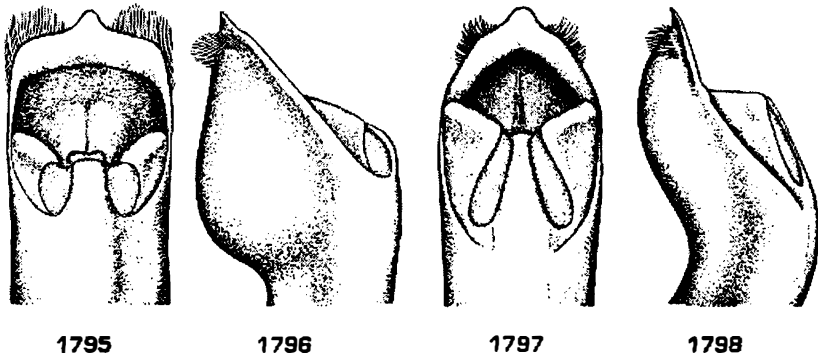
Figs. 1785-1790. Aedeagus in dorsal and lateral view: 1785, 1786 – *Pachybrachis (Pachybrachis) absinthii* (after LOPATIN 1990); 1787, 1788 – *P. (P.) anatolicus* (after LOPATIN 1985); 1789, 1790 – *P. (P.) laevigatus* (after BREIT 1921).

- 38. Apex of aedeagus with small median lamella ..... 39.
- Apex of aedeagus sharpened, without lamella. On pronotum an usual, great, M-shaped spot. (See *catalonicus*, auxiliary group B, thesis 12).



Figs. 1791-1794. Aedeagus in dorsal and lateral view: 1791, 1792 – *Pachybrachis (Pachybrachis) issykensis* (after LOPATIN 1974); 1793, 1794 – *P. (P.) lineolatus* (after PETITPIERRE 2000).

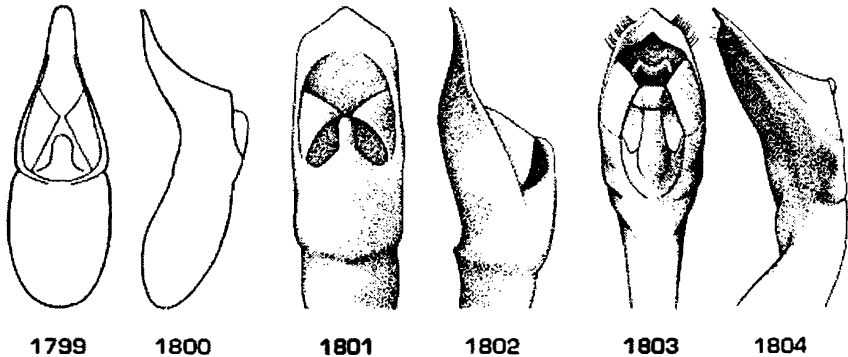
39. Apical lamella of aedeagus (figs 1797, 1798) large, bent ventrally. Head black with yellowish pattern, pronotum yellowish with a great M-shaped spot. Lateral widenings of this spot usually with a little yellowish dot inside. Elytra yellowish, rather strongly punctate; punctures black, confluent, forming longitudinal black stripes and yellowish interstices in relief as in *lineolatus* (thesis 35), but inner stripes in anterior part of elytra more confused, lateral stripes relatively regular. Underside black, mesoepimeres and lateral margins of urosternite yellowish. Pygidium black with a transversal fulvous stripe along apical margin. Length 2.5–3.5 mm (= *marchii* PIC, 1923, ?*incallidus* PIC, 1897 from Morocco). Variations: black stripes broadened, yellowish interstices very narrow (ab. *hellwigi* WEISE, 1882), yellowish interstices broader, lateral rows of punctures partly confused (ab. *diversepunctatus* PIC, 1907), black pattern on pronotum divided into three separate spots (ab. *erycinus* WEISE, 1882). Distributed in Italy, Sicilia, Corsica and Sardinia ..... ***scriptus* HERRICH-SCHÄFFER, 1838.**
- Apical lamella of aedeagus indistinct ..... **40.**



Figs. 1795-1798. Aedeagus in dorsal and lateral view: 1795, 1796 – *Pachybrachis (Pachybrachis) burlinii* (after DACCORDI and RUFFO 1971); 1797, 1798 – *P. (P.) scriptus* (after PETITPIERRE 2000).

40. Aedeagus very characteristic, its apical part elongate, strongly, gradually narrowed toward apex, apex rounded (figs 1799, 1800). A North-African form. Length 2.6–2.9 mm (= ? *pradensis* subsp. *incallidus* PIC, 1897). Variation: dark form; yellowish interstices in many places interrupted (ab. *obscurior* PIC, 1898). Distributed in Algeria and in Morocco ..... ***lallemani* MARSEUL, 1875.**
- Apical part of aedeagus differently shaped ..... **41.**
41. Apical part of aedeagus (figs 1801, 1802) in dorsal view with parallel sides. Upper side coloured as in *P. scriptus* (thesis 39), underside black with yellowish mesoepimeres. Last abdominal sternite with a short ochraceous stripe in the middle, pygidium flavous. Length 2.5–3.0 mm. Distributed in N Spain ..... ***petitpierrei* DACCORDI, 1976.**
- Apical part of aedeagus in dorsal view slightly but distinctly narrowed towards apex ..... **42.**

42. Aedeagus as in figs **1803, 1804**. Punctures of pronotum of different size, partly strong. Colouring of body like in *P. scriptus* (thesis 39), black humeral spot usually present. Black rows often here and there confluent, forming undefined black spots and stripes, particularly in apical and in middle part of elytron. Legs normally rather dark: femora brown with usual whitish spots, tibiae partly darkened. Length 2.2–2.8 mm (= *moroderi* PIC, 1913). Variations: legs not darkened, testaceous (ab. *moroderi* PIC, 1913), yellowish ground colour of upper side strongly reduced to a few spots on head, lateral margins of pronotum, subhumeral stripe and apex of elytra (ab. *subinterruptus* PIC, 1914). Distributed in Spain ..... ***baeticus*** WEISE, 1882.
- . Aedeagus as in figs **1806, 1807**. General view as in plate XLIV, **phot. 389**. Length 2.2–2.8 mm. Variations: light form; black rows nowhere confluent (ab. *teruelensis* PIC, 1913), dark form, yellowish interstices in many places interrupted (ab. *schaeferi* PIC, 1948). Distributed in Spain ..... ***pradensis*** MARSEUL, 1875. s. str.

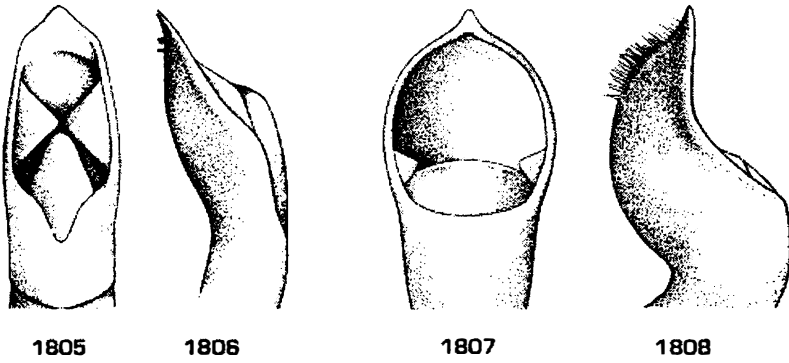


Figs. 1799-1804. Aedeagus in dorsal and lateral view: 1799, 1800 – *Pachybrachis (Pachybrachis) lallemanti* (orig.); 1801, 1802 – *P. (P.) petitpierrei* (after PETITPIERRE 2000); 1803, 1804 – *P. (P.) baeticus* (after PETITPIERRE 2000).

43. Mesoepimeres black. Externally similar to *scriptus* (thesis 39) and *lineolatus* (thesis. 35), but underside entirely black. In male last abdominal sternite with a large, shining depression and two wisps of white hairs Aedeagus as in figs **1808, 1809**. Length 2.8–3.5 mm. Distributed in SW Spain and S Portugal ..... ***rondanus*** BURLINI, 1968.
- . Mesoepimeres yellow ..... **44**.
44. W Mediterranean species ..... **45**.
- . Species described from ? S Russia. External view approximately as in *simius* (thesis 46), but spots on pronotum less distinct. Insufficiently studied species, sexual characters unknown ..... ***laetificus*** MARSEUL, 1875.
45. In lateral view aedeagus ventrally gently swollen or almost flat ..... **46**.
- . Aedeagus strongly swollen ventrally. Here some forms of *siculus* (auxiliary group B, thesis 16) with indistinct black spots on elytra.



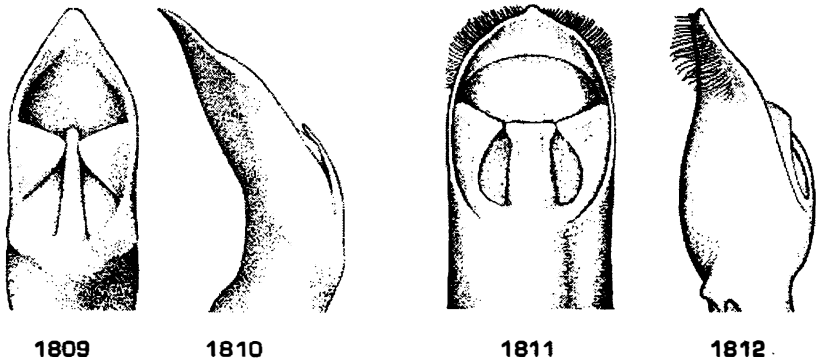
46. Underside of aedeagus (figs **1809**, **1810**) in lateral view almost flat. Length 2.5–3.0 mm (male) to 3.5–4.0 mm (female) (= *marocanus* PIC, 1954, nec 1945, *lepineyi* PIC, 1955). General view as in plate XLIV, **phot. 390**. Variations: each elytron with 3 blackish spots. On pronotum also 3 dark spots (ab. *externenotatus* PIC, 1910), upper side paler than normally, on pronotum 3 dark spots (ab. *pal-lidicolor* PIC, 1900), on each elytron 2 blurred spots: humeral and postmedian, punctures rather confuse (ab. *favarqci* PIC, 1907), elytral punctures more regular alineate, rather shallow (ab. *siculus* PIC, 1913). Distributed in N Africa, ab. *siculus* described from Sicily. Here perhaps also insufficiently described species *normandi* PIC, 1919 from Tunisia ..... **simius** MARSEUL, 1875.
- Underside of aedeagus in lateral view convex ..... **47**.



Figs. 1805-1808. Aedeagus in dorsal and lateral view: 1805, 1806 – *Pachybrachis (Pachybrachis) prandensis* (after PETITPIERRE 2000); 1807, 1808 – *P. (P.) rondanus* (after PETITPIERRE 2000).

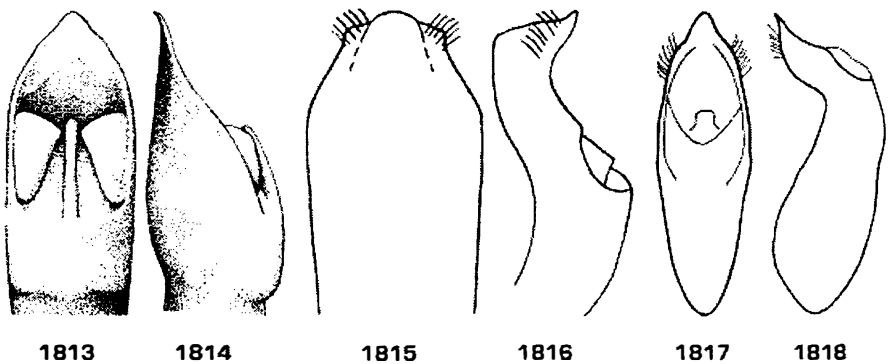
47. Length of body over 3.0 mm. Aedeagus as in figs **1811**, **1812**. Externally similar to *burlinii* (thesis 32). Length 3.4–3.6 mm. Described from Isole Egadi (near Sicily) ..... **osellai** DACCORDI et RUFFO, 1975.
- Length of body under 3.0 mm. Aedeagus as in figs **1813**, **1814**. Length 2.5–2.8 mm. Distributed in Iberian Peninsula and S France. Perhaps here the insufficiently studied species *coquereli* (REY, 1883) from Algeria, generally slightly paler than *rugifer* and with less regular arranged punctures on elytra ..... **rugifer** ABELLE, 1904.
48. Elytral puncturation entirely random, pronotal puncturation dense. Aedeagus (figs **1879**, **1880**) in lateral view without convexity on underside of apical half. Here pale forms of *altimontanus* (auxiliary group B, thesis 27).
- Elytral puncturation at least along sides and/or in hind part arranged in regular or semiregular longitudinal rows ..... **49**.
49. Puncturation of upper side strong ..... **50**.
- Puncturation of elytra moderately strong, more regularly arranged in longitudinal rows, body length under 3.8 mm ..... **58**.

50. Larger species, body length 3.5–4.5 mm. [Here perhaps also *P. letourneuxi* PIC, 1900, described from Israel as a variety of *scripticollis* (auxiliary group B, thesis 10), but probably a distinct species] ..... 51.  
 -. Smaller species, body length 2.8–4.1 mm ..... 52.



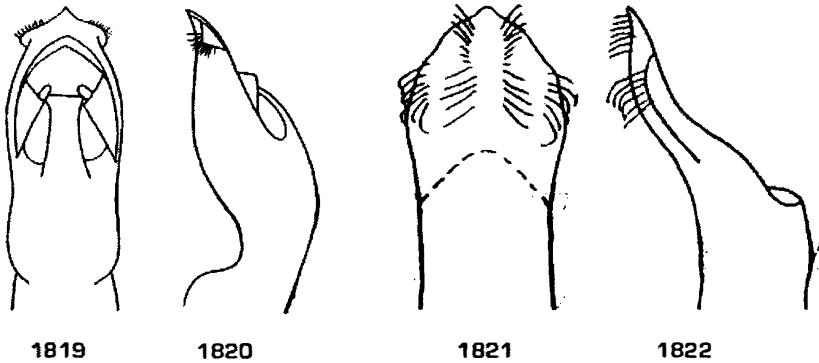
Figs. 1809-1812. Aedeagus in dorsal and lateral view: 1809, 1810 – *Pachybrachis (Pachybrachis) simius* (after PETITPIERRE 2000); 1811, 1812 – *P. (P.) osellai* (after RUFFO 1975).

51. Aedeagus as in figs 1852, 1853. Distributed in Kazakhstan. Here pale forms of *jacobsoni* (auxiliary group B, thesis 24), with reduced black pattern on elytra.  
 -. Aedeagus as in figs 1815, 1816. Black spots on pronotum large. Described from China (Sichuan) ..... *lineatus* WEISE, 1889.



Figs. 1813-1818. Aedeagus in dorsal and lateral view: 1813, 1814 – *Pachybrachis (Pachybrachis) rugifer* (after PETITPIERRE 2000); 1815, 1816 – *P. (P.) lineatus* (after MEDVEDEV and RYBAKOVA 1980); 1817, 1818 – *P. (P.) sinkianensis* (after LOPATIN 1995).

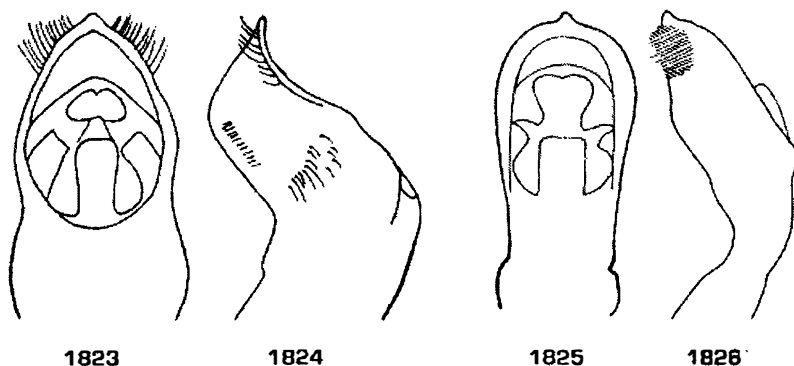
52. Length under 2.9 mm. Upper side relatively very dark, M-shaped pattern on pronotum large, elytra with longitudinal, partly fused stripes compound of black punctures. Apex of aedeagus (figs 1817, 1818) with large, lobe-like lamella. Length 2.8–2.9 mm. Described from Bogdoshan range, distr. Urumchi, prov. Sinkiang, NW China ..... *sinkianensis* LOPATIN, 1995.
- Length over 3.0 mm. Apex of aedeagus (if known) differently shaped ..... 53.
53. E Mediterranean species ..... 54.
- Asiatic species ..... 55.
54. Smaller. Externally similar to *scripticollis* (auxiliary group B, thesis 10), but stronger punctured. Length about 3.0 mm (= ? *akbesianus* PIC, 1907). Aedeagus not studied. Poorly known species, described from Lebanon, perhaps conspecific with *scripticollis* ..... *libanicola* REY, 1883.
- Larger. Coloured similarly as *libanicola* (thesis 54), but body much larger, head more largely pale, puncturation of elytra more random. Aedeagus not studied. Species insufficiently studied, aedeagus not described. Length 4.5 mm. Distributed in Syria ..... *peyroni* PIC, 1914.
55. Apex of aedeagus (figs 1819, 1820) in dorsal view with short lateral broadenings. Length 3.2–3.4 mm (male to 3.7–4.0 mm (female). Described from Iran (prov. Fars) ..... *rapillyi* LOPATIN, 1984.
- Apex of aedeagus without broadenings ..... 56.



Figs. 1819-1822. Aedeagus in dorsal and lateral view: 1819, 1820 – *Pachybrachis (Pachybrachis) rapillyi* (after LOPATIN 1984b); 1821, 1822 – *P. (P.) potanini* (after MEDVEDEV and RYBAKOVA 1980).

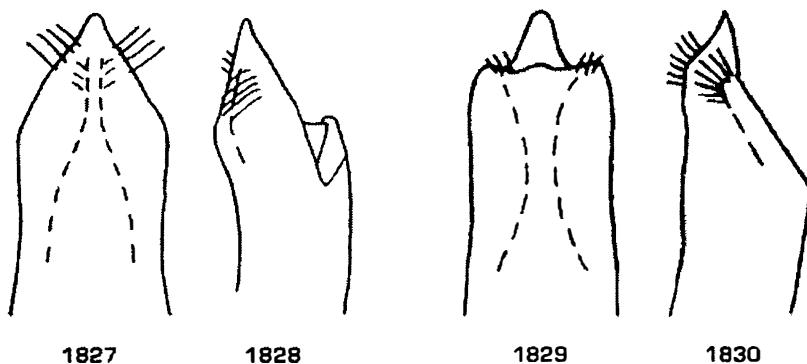
56. Apex of aedeagus (figs 1821, 1822) laterally rounded, slightly broadened, with short and broad lamella, in lateral view without convexity on underside. Length 3.3–3.6 mm (male) to 3.6–4.1 mm (female). Described from N China (E Tsinghai) ..... *potanini* MEDVEDEV et RYBAKOVA, 1980.
- Apex of aedeagus differently shaped ..... 57.
57. Outline of aedeagus (figs 1823, 1824) similar as in *jacobsoni* (auxiliary group B, thesis 24), in lateral view with thickening near apex, perhaps conspecific with

- mentioned species. Length 3.1–3.7 mm. Described from Kazakhstan .....  
 ..... **heptapotamicus** LOPATIN, 1997.  
 -. In lateral view thickening of underside of aedeagus (figs **1825**, **1826**) distant  
 from apex. Length 3.2 mm. Species described from Afghanistan .....  
 ..... **afghanensis** LOPATIN, 1966.



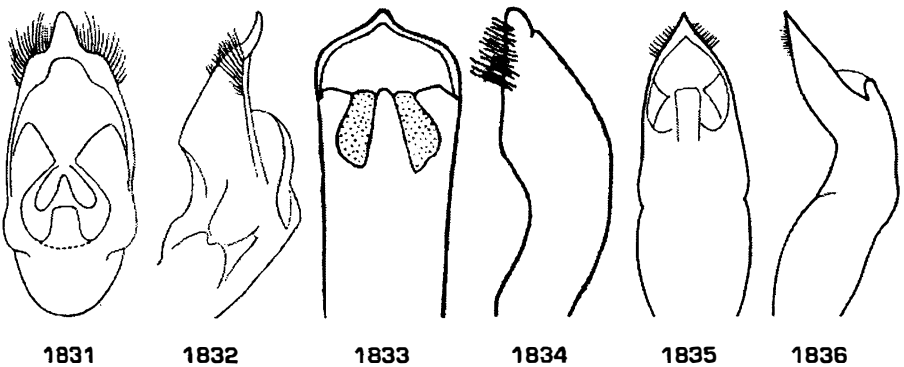
Figs. 1823-1826. Aedeagus in dorsal and lateral view: 1823, 1824 – *Pachybrachis (Pachybrachis) heptapotamicus* (after LOPATIN 1997); 1825, 1826 – *P. (P.) afghanensis* (after LOPATIN 1966b).

58. Apex of aedeagus (figs **1827**, **1828**) triangular. Colouration of upper side as in *scripticollis* (auxiliary group B, thesis 10). General view as in plate XLIV, **phot. 391**. Length 2.5–3.3 mm (male) to 2.8–4.2 mm (female). Described from Mongolia ...  
 ..... **mongolensis** MEDVEDEV et RYBAKOVA, 1982.  
 -. Apex of aedeagus not triangular ..... **59**.



Figs. 1827-1830. Aedeagus in dorsal and lateral view: 1827, 1828 – *Pachybrachis (Pachybrachis) mongolensis* (after MEDVEDEV and RYBAKOVA 1980); 1829, 1830 – *P. (P.) transbaicalicus* (after MEDVEDEV 1982).

59. Apex of aedeagus (figs **1849**, **1850**) narrowed, with parallel sides, bent up. Pronotum with M-shaped black pattern, on lateral part of this pattern a yellow dot. Elytra entirely pale, yellowish-grey, length 2.6–3.3 mm. Here pale forms of *scripticollis* (see auxiliary group B, thesis 10)
- Apex of aedeagus differently shaped ..... **60.**
60. Very small, length about 2.2 mm. Pronotum yellow with M-shaped pattern, elytra without black markings, covered by brownish punctures, along lateral sides and in hind part arranged in rather regular longitudinal rows. Apex of aedeagus (figs **1829**, **1830**) transversely cut with large, obtuse lamella. Described based from one male only from vicinity of lake Khara-Nor, distr. Chita, Transbaikalia, Russia ..... *transbaikalicus* MEDVEDEV, 1975.
- Length of body at least 2.5 mm ..... **61.**
61. Apex of aedeagus (figs **1831**, **1832**) with large, lobe-shaped lamella. Puncturation of elytra random, much stronger than on pronotum, along lateral margins run 2 regular or almost regular rows. Pronotum with 5 black spots, on elytra black punctures connected by numerous, thin black lines, yellowish ground divided into involved small stripes and lines. Length 3.2 mm (male) to 4.0 mm (female). Described from Turkmenistan ..... *tekensis* LOPATIN, 1983.
- Apex of aedeagus differently shaped ..... **62.**



Figs. 1831-1836. Aedeagus in dorsal and lateral view: 1831, 1832 – *Pachybrachis (Pachybrachis) tekensis* (after LOPATIN 1983); 1833, 1834 – *P. (P.) dimorphus* (after MEDVEDEV 1978); 1835, 1836 – *P. (P.) mogol* (after LOPATIN 1986).

62. Externally similar to *nigropunctatus* (thesis 28), but on average smaller and differing by black spots on pronotum. In male abdomen black with yellow lateral and apical border. In female abdomen yellow, slightly darker at base. Legs reddish brown with pale spot at apex of femora Aedeagus as in figs **1833**, **1834**. Length 2.8–3.1 mm (male) to 3.5–3.6 mm (female). Described from Afghanistan (Kandahar) ..... *dimorphus* MEDVEDEV, 1978.
- Not as above ..... **63.**

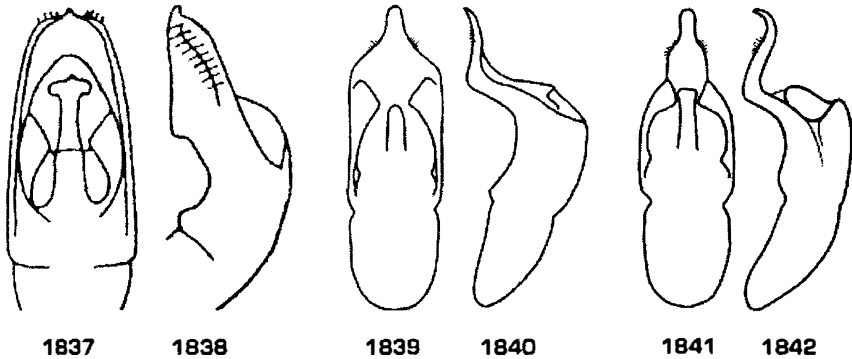
63. Apex of aedeagus (figs **1835**, **1836**) in dorsal view sharpened, sides of apical part roundish narrowed. M-shaped pattern on pronotum well-developed, black, puncturation of elytra black, arranged in longitudinal rows, intervals yellow, convex, impunctate. Pronotum 1.4 × broader than long, densely and uniformly punctured. Length 2.5 mm (male) to 3.2 mm (female). Described from Tadjhikistan ..... *mogol* LOPATIN, 1986.
- . Apex of aedeagus (figs **1837**, **1838**) in dorsal view not sharpened, but transversely cut, with short and broad lamella. In male first tarsomere of fore legs fairly broadened, as broad as tarsomere 3. Colouration of body similar as in *scripticollis* (auxiliary group B, thesis 10). Length 2.5–3.7 mm. Described from vicinity of lake Zaisan (E Kazakhstan) ..... *mitjaevi* LOPATIN et KULENOVA, 1982.

### Auxiliary group B

#### Key to species

1. Mesoepimeres yellow, black with yellowish stripe or black with yellow spot ..... **2**.
- . Mesoepimeres black, sometimes at most with indistinct, blurred lightening. Here also variations with entirely black mesoepimeres of *planifrons* (thesis 20) and *suffriani* (antithesis 18) ..... **32**.
2. Distance between eyes smaller than distance between antennal insertions ..... **3**.
- . Distance between eyes not smaller than distance between antennal insertions ... **4**.
3. Apical margin of pygidium deeply incised. Colouration of body as in *flexuosus* (antithesis 3), general view as in plate XLIV, **phot. 392**. Aedeagus as in figs **1839**, **1840**. Length 3.0–3.5 mm. Distributed in Asia Minor and Bulgaria ..... *excisus* WEISE, 1897.
- . Apical margin of pygidium not incised. Head yellow with two black spots by antennal insertions, narrow stripes in the middle of frons, along innern margins of eyes and with a black spot on vertex. Pronotum strongly, deeply punctate, with usual great M-shaped spot. Elytra yellow with 5 blurred black spots (3 laterally and 2 on the disc), interstices yellow, convex and shining, in many places interrupted. General view as in plate XLIV, **phot. 393**. Aedeagus very characteristic (figs **1841**, **1842**). Length 3.2–3.7 mm. In Greece occurs a form with well-defined elytral spots (subsp. *oertzeni* WEISE, 1886 = *dalmatinus* PIC, 1908). Variations: yellow apical margin of elytra with a short branch, eyes a little less close (ab. *viennensis* WEISE, 1882), on upper side black pattern partly reduced, yellow colour predominates (ab. *stramineus* BURLINI, 1968). Distributed in south-eastern part of Europe from northern Italy, Austria and Hungary to Greece ..... *flexuosus* WEISE, 1882.
4. European and Mediterranean species (Asia Minor and Caucasian countries included) ..... **5**.
- . Asiatic species ..... **23**.
5. Lateral ridge of pronotum entirely yellowish ..... **6**.
- . Lateral ridge of pronotum more or less blackened ..... **13**.
6. Pronotum ochraceous with 3 pitchy-brown spots in posterior part. Elytra yellowish with 4 blackish spots (3 laterally and 1 apically). General view as in plate XLIV,

- phot. 394.** Aedeagus as in figs **1843, 1844**. Length 3.2–3.7 mm. Described from Jordan ..... **jordanicus** LOPATIN, 1984.
- Pronotum differently coloured ..... **6**.
  - 7. Eyes smaller. Distance between eyes not shorter than length of eye. Body stocky, pronotum very short. Black pattern of upper side similar to *suffriani* (antithesis 18). Elytra fulvous with black rows of punctures, each with 5 black spots. General view as in plate XLIV, **phot. 395**. Legs entirely pale. Aedeagus characteristic (figs **1845, 1846**). Length of body 3.2–3.5 mm. Variation: black colour of upper side strongly extended; elytra black with a few little fulvous stripes only (ab. *theresae* PIC, 1907). Endemic to Crete ..... **creticus** WEISE, 1886.
  - Eyes larger. Distance between eyes shorter than length of eye ..... **8**.

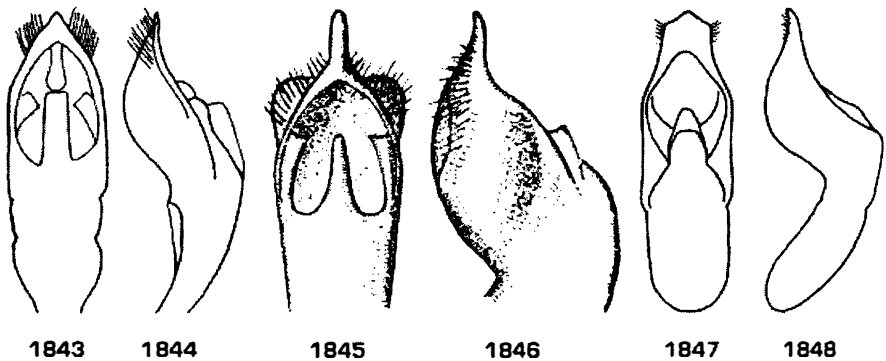


Figs. 1837-1842. Aedeagus in dorsal and lateral view: 1837, 1838 – *Pachybrachis (Pachybrachis) mitjaevi* (after LOPATIN 1990); 1839, 1840 – *P. (P.) excisus* (after WARCHAŁOWSKI 1991); 1841, 1842 – *P. (P.) flexuosus* (after WARCHAŁOWSKI 1991).

- 8. Elytra for the most part pale, especially behind the middle ..... **9**.
- Black pattern present also in posterior part of elytra ..... **10**.
- 9. Pygidium usually entirely black, sometimes with two little yellowish dots. Aedeagus as in nominotypical subspecies (thesis 17). Length 3.0–4.1 mm. Variations: length of body 3.0–3.3 mm, lateral ridge of pronotum yellowish (ab. *cuencanus* BURLINI, 1968), length of body 3.4–3.8 mm, upper side almost entirely black (ab. *niger* BURLINI, 1968), length of body 3.0–3.3 mm, lateral ridge of pronotum black, on elytron three lateral spots fused (ab. *imitans* BURLINI, 1968). Distributed in Spain ... **hieroglyphicus** subsp. **pseudoscriptus** WAGNER, 1927.
- Pygidium black with a great kidney-shaped flavous spot. General view as in plate XLIV, **phot. 396**. Scutellum usually pale, lateral spots on pronotum separate. Aedeagus as in figs **1847, 1848**. Length 3.0–3.6 mm. In the most part of distribution area occurs subsp. *suturalis* WEISE, 1882 (= *bimaculatus* REY, 1883, generally darker coloured; scutellum entirely black or with a yellowish dot in the middle, elytra strongly punctate, with distinct blackish pattern consisting of a long discal stripe

and three lateral spots). Variations: all blackish pattern of pronotum joined (ab. *gallicus* WEISE, 1882), last abdominal sternite with 4 yellowish spots (ab. *quadrimaculatus* REY, 1883), last abdominal sternite entirely black (ab. *subtilis* REY, 1883), on elytra 2. and 3. lateral spot absent (ab. *reductus* REY, 1883), all margins of pronotum black, punctural rows of elytra blackish (ab. *leveillei* PIC, 1913), elytra pale with a short sutural stripe and with three lateral spots black (ab. *molloensis* PIC, 1955). Colouring of body lighter, yellowish pattern on last abdominal sternite extended, encroaching partly on penultimate sternite (ab. *angustifrons* REY, 1883), Colouring of body very dark; elytra entirely black or with little traces of yellowish interstices only (ab. *gavoysi* BURLINI, 1968, nec PIC, 1955). Distributed from northern Spain to southern Ukraine. Typical form and its variations known mainly from France, the rest of the area inhabited by subsp. *suturalis* ..... ***pallidulus*** SUFFRIAN, 1851.

10. Apex of aedeagus (figs **1849, 1850**) narrowed, with parallel sides, bent up. Pronotum with M-shaped black pattern, on lateral part of this pattern almost always with a yellow dot. Black colour on elytra form two longitudinal stripes, sometimes reduced or absent (see also *libanicola*, auxiliary group A, thesis 54). General view as in plate XLV, **phot. 397**. Length 3.0–3.2 mm (= *israelita* TAPPES, 1871, ?*pentheri* GANGLBAUER, 1905). Rather broadly distributed in Near East, Caucasian countries, N Iran, Turkmenistan and Afghanistan. Varieties: *letourneuxi* (PIC, 1900) from Algeria and *arisi* (PIC, 1908) from NW China belong certainly not here .....  
 ..... ***scripticollis*** FALDERMANN, 1837.  
 –. Aedeagus differently shaped ..... **11.**

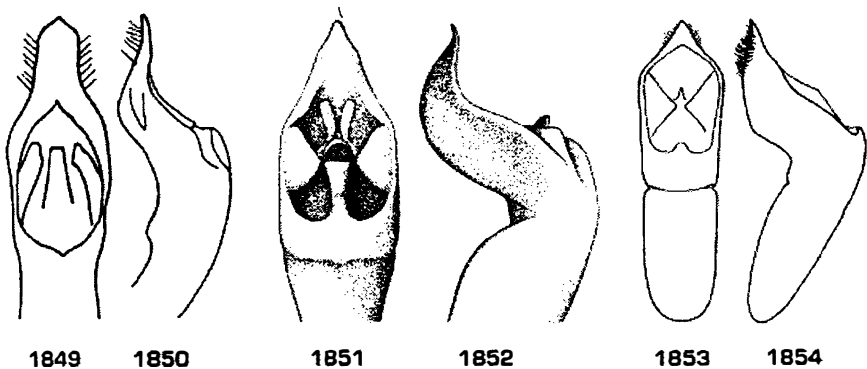


Figs. 1843-1848. Aedeagus in dorsal and lateral view: 1843, 1844 – *Pachybrachis (Pachybrachis) jordanicus* (after LOPATIN 1984a); 1845, 1846 – *P. (P.) creticus* (after BURLINI 1968); 1847, 1848 – *P. (P.) pallidulus* (after WARCHALOWSKI 1991).

11. Aedeagus as in figs **1859, 1860**. Here some forms of *P. hieroglyphicus* (thesis 17).  
 –. Apex of aedeagus approximately triangular ..... **12.**  
 12. Species distributed in northern Spain and in southern France. Black pattern of upper side and the relatively slender body outline as in *suffriani* (antithesis 18). General

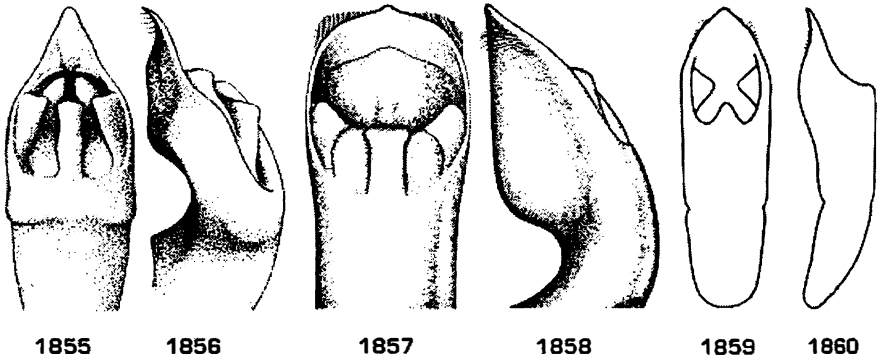


- view as in plate XLV, **phot. 388**. Aedeagus as in figs **1851, 1852**. Length 3.0 mm. Variation: mesoepimeres entirely black (subsp. *fallaciosus* BURLINI, 1968, from France) ..... **catalonicus** BURLINI, 1968.
- Species distributed in Asia Minor and in Caucasian countries. General view as in plate XLV, phot. 399. Aedeagus as in figs **1853, 1854**. Length 3.8–4.2 mm ..... **albicans** WEISE, 1882.
13. Elytra black with relatively sparse yellowish pattern, consisting of little impunctate spots and narrow stripes, distinctly elevated over surface. Length 2.3–2.8 mm. Here *mendax*, ab. *kislovodskensis*, see antithesis 51.
- Yellowish pattern broader, flat, usually sparsely dark punctate ..... **14**.
14. Elytra yellowish, black pattern normally consist of a long discal stripe (sometimes interrupted) and three lateral spots ..... **15**.
- Elytra black with small yellowish spots or stripes ..... **19**.
15. Yellow discal stripe very broad, not interrupted, black lateral spots on elytra fused into longitudinal, continuous, relatively narrow stripe, running parallel to lateral margin. Aedeagus as in figs **1855, 1856**. Punctuation black. General view as in plate XLV, **phot. 400**. Length 3.5–4.0 mm. Distributed in Spain ..... **ptermelas** GRAËLLS, 1858.
- Yellow discal stripe usually interrupted, black lateral spots large, separate, sometimes partly fused, never forming a continuous stripe ..... **16**.
16. Length of body 2.8–3.0 mm. Aedeagus (figs **1857, 1858**) gradually broadened towards apex with a long triangular process. Variations: a dark form; elytra black, anterior and (partly) lateral margins alike a apical spot yellowish, last abdominal segment entirely black, mesoepimeres black with a narrow, reddish stripe (ab. *madoniensis* BURLINI, 1963), a rather lightly coloured form; elytra yellowish with usual black pattern, black longitudinal stripe fused with 3. lateral spot, last abdominal segment ventrally and dorsally with little fulvous dots (ab. *imitator* BURLINI, 1968). Endemic to Sicily ..... **siculus** WEISE, 1891.
- Length of body over 3.0 mm ..... **17**.



Figs. 1849-1854. Aedeagus in dorsal and lateral view: 1849, 1850 – *Pachybrachis (Pachybrachis) scripticollis* (after LOPATIN 1977); 1851, 1852 – *P. (P.) catalonicus* (after PETITPIERRE 2000); 1853, 1854 – *P. (P.) albicans* (after WARCHAŁOWSKI 1998).

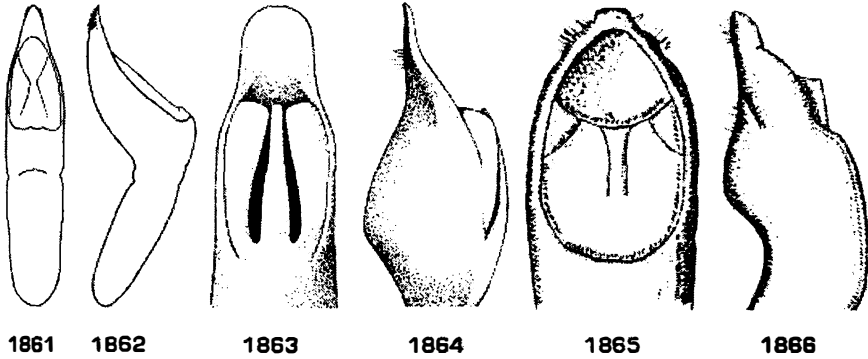
17. Aedeagus (figs **1859**, **1860**) in distal part slightly narrowed, apical margins form an obtuse angle. General view as in plate XLV, **phot. 401**. Pronotum yellowish with M-shaped pattern, elytron with 5 black spots. Length 3.1–4.2 mm (= *histrion* FABRICIUS, 1781, *atomarius* GEBLER, 1830, ? *noticollis* REY, 1883). Numerous variations were described The most important variations: pronotal pattern divided into separate spots (ab. *ictericus* WEISE, 1882), pronotum and elytra for the most part black (melanotic aberrations). Very widely distributed from Iberian Peninsula to E Siberia ..... ***hieroglyphicus*** (LAICHAERTING, 1781).
- . Aedeagus in distal part either rather strongly narrowed or forms a flat, broad process ..... **18**.



Figs. 1855-1860. Aedeagus in dorsal and lateral view: 1855, 1856 – *Pachybrachis (Pachybrachis) pteromelas* (after PETITPIERRE 2000); 1857, 1858 – *P. (P.) siculus* (after DACCORDI and RUFFO 1975); 1859, 1860 – *P. (P.) hieroglyphicus* (after WARCHALOWSKI 1991).

18. Aedeagus (figs **1861**, **1862**) apically narrowed. Length 3.1–3.9 mm. Variations: upperside yellowish, on pronotum a great M-shaped spot, on elytron 5 black spots (typical form), on elytra lateral spots 2 and 3 fused (ab. *beckeri* PIC, 1910), upper side for the most part black, anterior and lateral margins of pronotum narrowly yellow, elytra black with anterior margin and subhumeral area fulvous (ab. *lugubris* WEISE, 1882), upper side entirely or almost entirely black (ab. *piceus* SUFFRIAN, 1848). Distributed from Bulgaria and Romania to Korea ..... ***scriptidorsum*** MARSEUL, 1875.
- . Aedeagus apically with a flat, broad process, ventrally with a high swelling (figs **1863**, **1864**). Length 3.4–3.9 mm. Distributed in Spain ..... ***suffrianii*** SCHAUFUSS, 1862.
19. Yellowish apical spot not prolonged (neither along suture, nor along lateral margin). Pronotum black with very narrow fulvous stripe along anterior and lateral margins, marginal ridges remaining black. Elytra black with fulvous anterior marginal ridge, with a few little fulvous dots on interstices 6–8 and with semilunar spot at apex Aedeagus as in figs **1865**, **1866**. Length 2.5–3.0 mm. Variation: pronotum enti-

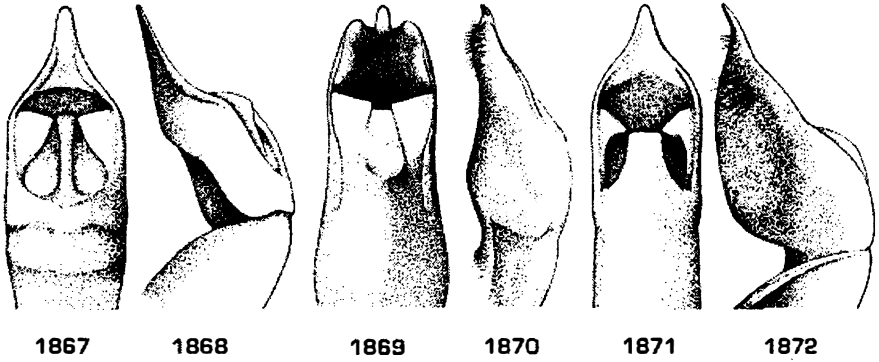
- rely black, elytral yellowish pattern largely reduced (ab. *solarii* BURLINI, 1968).  
 Distributed in Italy ..... **salfii** BURLINI, 1956.
- Yellowish apical spot prolonged along suture, sometimes also along lateral margin ...  
 ..... **20.**
20. On elytron a long, slanting, yellowish stripe branch off from apical spot, reaching  
 almost to humeral area of elytron. Aedeagus as in figs **1867**, **1868**. Length 3.0–  
 3.5 mm. Variations: mesoepimeres black (ab. *perplexus* BURLINI, 1968), elytron  
 in anterior part with a few yellowish interstices (ab. *avignonensis* BURLINI, 1968).  
 Distributed in southern France and in Spain ..... **planifrons** WAGNER, 1927.
- Elytron without such a stripe ..... **21.**



Figs. 1861-1866. Aedeagus in dorsal and lateral view: 1861, 1862 – *Pachybrachis (Pachybrachis) scriptidorsum* (after WARCHALOWSKI 1998); 1863, 1864 – *P. (P.) suffriani* (after PETITPIETRE 2000); 1865, 1866 – *P. (P.) salfii* (after BURLINI 1968).

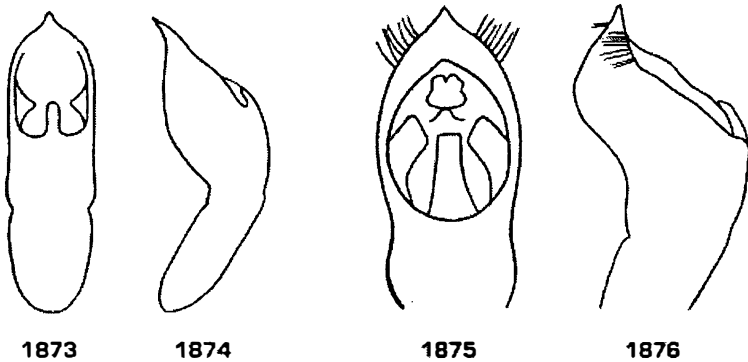
21. Body length not exceeding 3.5 mm. General view as in plate XLV, **phot. 402**.  
 Apex of aedeagus (figs **1869**, **1870**) with two excisions. Head yellowish with black  
 vertex and with two little black spots between eyes. Pronotum black with yellowish  
 pattern consisting of a narrow yellowish stripe along anterior and lateral margins,  
 median line anteriorly and two lines in posterior part. Elytra black with yellowish  
 border anteriorly, laterally and along suture in posterior half. Length 3.0–3.5 mm  
 (= *carpetanus* BURLINI, 1968). Variation: body entirely black, legs and antenna  
 basally reddish (ab. *obscuricolor* BURLINI, 1968). (Here also an insufficiently stud-  
 ied, similarly coloured Spanish species, *obscuricolor* FUENTE, 1909, male unknown).  
 Distributed in Spain ..... **kraatzii** WEISE, 1882.
- Apex of aedeagus without excisions ..... **22.**
22. Species from west-mediterranean area. Head black with labrum and clypeus (in male)  
 or with four little spots (female) yellowish. Pronotum and elytra coloured similarly  
 as in *kraatzii* (thesis 21). Aedeagus as in figs **1871**, **1872**. Length 2.8–3.0 mm.  
 Known from Morocco, Spain and Portugal ..... **lindbergi** BURLINI, 1963.
- Species from southern Carpathians. Upper side black with yellowish pattern. Pron-  
 otum black with yellowish pattern consisting of a narrow yellowish stripe along

anterior and lateral margins, median stripe anteriorly and two stripes in posterior part. Yellow pattern of elytra distinctly convex. Aedeagus as in figs 1873, 1874. Length 3.0–3.5 mm. Distributed in Romania and Moldova ..... *carpathicus* REY, 1883.



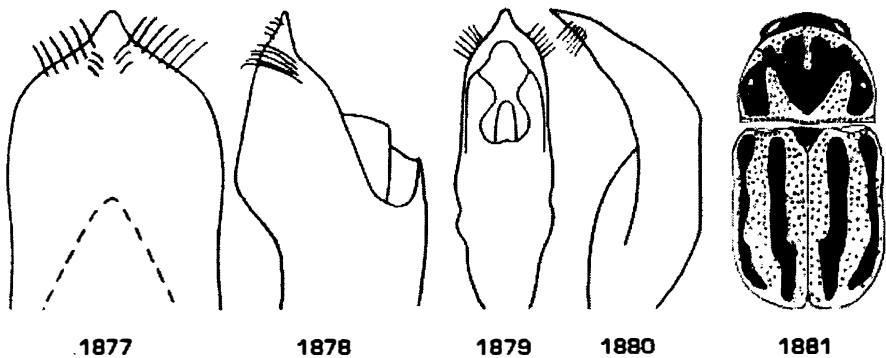
Figs. 1867-1872. Aedeagus in dorsal and lateral view: 1867, 1868 – *Pachybrachis (Pachybrachis) planifrons* (after PETITPIERRE 2000); 1869, 1870 – *P. (P.) kraatzi* (after PETITPIERRE 2000); 1871, 1872 – *P. (P.) lindbergi* (after PETITPIERRE 2000).

- 23. Punctuation of upper side strong, punctures on elytra random, here and there (or along lateral margin only) forming indistinct rows ..... 24.
- . Punctuation of upper side moderately strong, arranged in regular or almost regular rows ..... 29.



Figs. 1873-1876. Aedeagus in dorsal and lateral view: 1873, 1874 – *Pachybrachis (Pachybrachis) carpathicus* (after WARCHAŁOWSKI 1991); 1875, 1876 – *P. (P.) jacobsoni* (after MEDVEDEV and RYBAKOVA 1980).

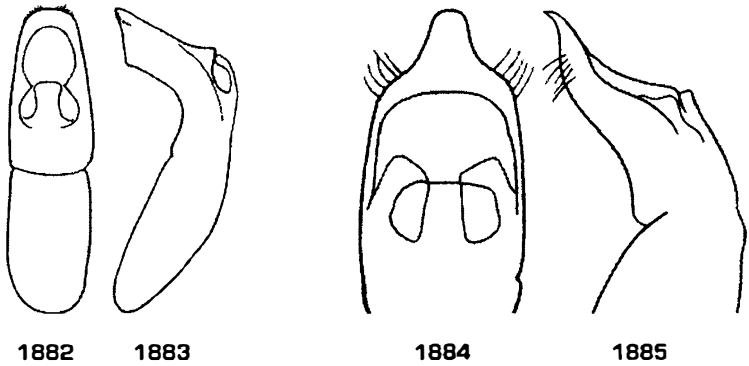
24. Upper side pale yellowish. On pronotum 5 black spots, in darker coloured specimens forming M-shaped pattern. On each elytron 6 black spots: two behind anterior margin, two in apical part, one in the middle at lateral margin and one (short longitudinal stripe) near centre. General view as in plate XLV, **phot. 403**. Aedeagus as in figs **1875**, **1876**. Length 3.8–4.5 mm. Distributed in Transcaspia, Iran and Afghanistan ..... **jacobsoni** LOPATIN, 1968.
- Upper side differently coloured ..... **25**.
25. Legs with black spot or black stripe on dorsal side ..... **26**.
- Legs pale ..... **27**.
26. Black pattern on elytra distinct, separated from each other. Here some forms of *hieroglyphicus* (thesis 17) and *ochropygus* (antithesis 31).
- Black pattern on elytra partly fused, hind spots before apex form a horsehoe-shaped pattern. Pronotum with M-shaped black pattern, femora with darkened ventral- and dorsal margins, pygidium entirely black. Aedeagus as in figs **1877**, **1878**. Length 3.2 mm. In mountain system Gobi Altai appears a form differing from nominotypical subspecies by presence of a trasverse, in middle interrupted row of hairs on underside of apex of aedeagus (subsp. *changaica* MEDVEDEV et RYBAKOVA, 1980). Distributed in Mongolia ..... **caraganae** LOPATIN, 1977.



Figs. 1877-1881: 1877-1880 – aedeagus in dorsal and lateral view, 1881 – general view: 1877, 1878 – *Pachybrachis (Pachybrachis) caraganae* (after MEDVEDEV 1982); 1879, 1880 – *P. (P.) altimontanus* (after LOPATIN 1968); 1881 – *P. (P.) saudicus* (after LOPATIN 1979).

27. Puncturation of yellow parts of pronotum very dense, interstices convex. Black spots on elytra small, central inner spot often disappearing. Aedeagus as in figs **1879**, **1880**. Length 3.0–3.5 mm. Described from Kyrgyzstan ..... **altimontanus** LOPATIN, 1968.
- Puncturation of yellow parts of pronotum sparse or moderately dense, in hind and lateral part interstices broader than diameter of punctures. Puncturation of elytra entirely random. Black pattern on upper side as in fig. **1881**. Length 3.5 mm. Described from Saudi Arabia, based on one female only .... **saudicus** LOPATIN, 1979.
- Not as above ..... **28**.

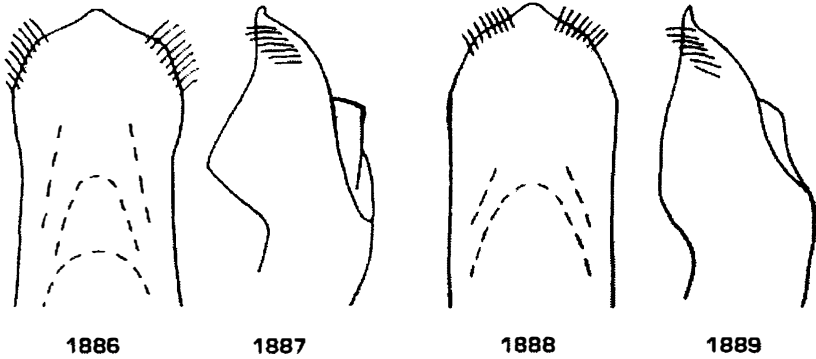
28. On each elytron broad, blackish or black longitudinal stripe. On pronotum 5 black spots, sometimes fused into M-shaped pattern. Anal sternite with two yellow lateral stripes on apical margin, on pygidium large yellow spot incised anteriorly, in dark coloured specimens horsehoe-shaped, but never divided. Puncturation of elytra in scutellar area strong, black, random, distinctly stronger than puncturation of pronotum. Parallel to lateral margin runs one complete row of punctures. In very pale aberrations black elytral pattern entirely disappear; such specimens are easily distinguishable from species of auxiliary group A by following combination of characters: legs entirely dark yellow, black spots on pronotum distinct, always well-developed, length of body over 3.8 mm. General view as in plate XLV, **phot. 404**. Aedeagus as in figs **1882, 1883**. Length 3.9–4.7 mm. Distributed in Japan, reported also from China (Sichuan) ..... **eruditus** BALY, 1873.
- . On each elytron 3–5 black spots, sometimes partly fused ..... **29**.



Figs. 1882-1885. Aedeagus in dorsal and lateral view: 1882, 1883 – *Pachybrachis (Pachybrachis) eruditus* (orig.); 1884, 1885 – *P. (P.) ghilarovi* (after LOPATIN 1977a).

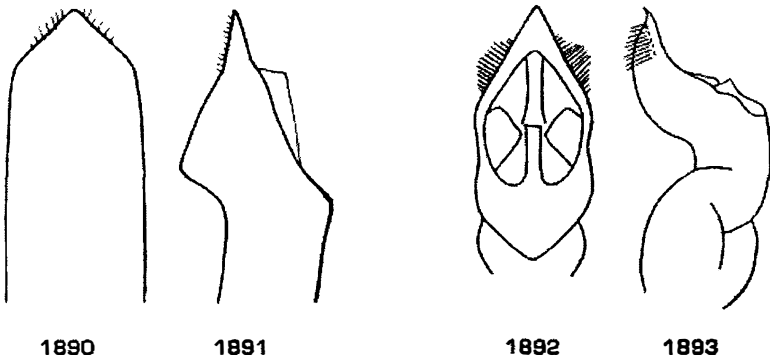
29. Black spots on elytra small, usually only three outer spots present. Black punctures forming almost regular rows. Aedeagus as in figs **1884, 1885**. Length about 3.0 mm. Described from vicinity of the lake Balkhash (Kazakhstan) ..... **ghilarovi** LOPATIN, 1974.
- . Black spots on elytra large (approximately as in *hieroglyphicus*, thesis 17) ..... **30**.
30. Apical half of aedeagus in lateral view with roundish rather high, but not angulate convexity on underside. Legs dark yellow with whitish spot before apex of meso- and metafemora, anal sternite at hind margin with short lateral stripe, two yellow spots on pygidium always distinct ..... **31**.
- . Apical half of aedeagus in lateral view with strong, almost angulate convexity on underside (figs **1886, 1887**). Body stout, general view as in plate XLV, **phot. 405**. Length 3.0–3.3 mm. Distributed in Russia (Tschita province), Mongolia, N China and Korea ..... **lopardini** MEDVEDEV et RYBAKOVA, 198).

31. Length 3.0–3.5 mm (= *kaszabi* LOPATIN, 1966). Colouration of body similar as in *lopatini* (antithesis 30), body less stout. Aedeagus as in figs **1888**, **1889**. Distributed in Mongolia and NW China. Here also *instabilis* (WEISE, 1887) described from Tian-Shan mountains: male unknown, female not distinguishable from *distictopygus*, perhaps conspecific with him ..... ***distictopygus*** JACOBSON, 1901.
- Upper side coloured as in *hieroglyphicus*. Aedeagus as in figs **1890**, **1891**. Inner spots on elytra not fused into longitudinal, broad stripe. Length 3.0–3.4 mm (male) to 3.6–4.3 mm (female) (= *sexsignatus* WEISE, 1889). Distributed in E Siberia, N China and Korea ..... ***ochropygus*** SOLSKY, 1872.



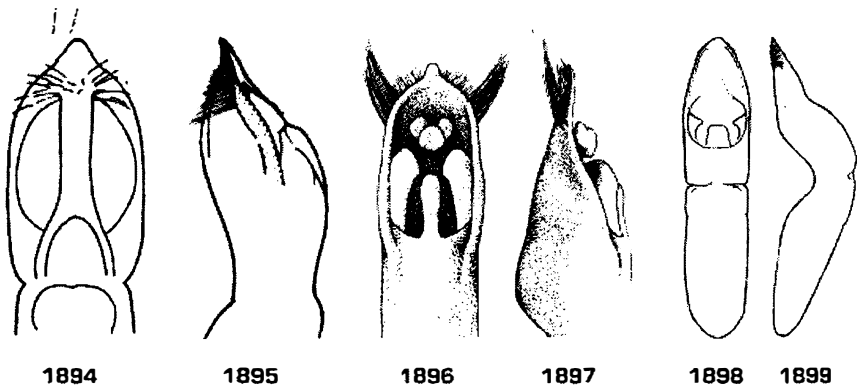
Figs. 1886–1889. Aedeagus in dorsal and lateral view: 1886, 1887 – *Pachybrachis (Pachybrachis) lopatini* (after MEDVEDEV and RYBAKOVA 1980); 1888, 1889 – *P. (P.) distictopygus* (after MEDVEDEV and RYBAKOVA 1980).

32. Upper side entirely or almost entirely black ..... **33.**
- Body with well-developed pale pattern or markings ..... **34.**



Figs. 1890–1893. Aedeagus in dorsal and lateral view: 1890, 1891 – *Pachybrachis (Pachybrachis) ochropygus* (after MEDVEDEV and RYBAKOVA 1980); 1892, 1893 – *P. (P.) amurensis* (after MEDVEDEV 1973).

33. Upper side entirely black, sometimes with reduced yellowish pattern on head only. Here melanotic variations of different species, to begin with *hieroglyphicus* (thesis 17), *scriptidorsum* (thesis 18), *albicans* (antithesis 12), *limbatus* (auxiliary group C, thesis 13) and *terminalis* (antithesis 35), distinguishable by form of aedeagus, sometimes also by comparison of longer series of well-determined specimens.
- Upper side black with weakly developed yellowish pattern ..... 34.
34. Puncturation of pronotum and elytra conspicuously deep, dense and uniformly scattered. Pronotum black, its anterior border and two spots at basal margin yellow. Elytra black with yellow stripes along basal margin, at humeral callus, on disc and at apex. Aedeagus as in figs 1894, 1895. Length 3.2-3.4 mm. Described from SW Iran ..... ***pudicus*** LOPATIN, 1984.
- Puncturation of upper side often strong, but not conspicuously dense and deep ..... 35.

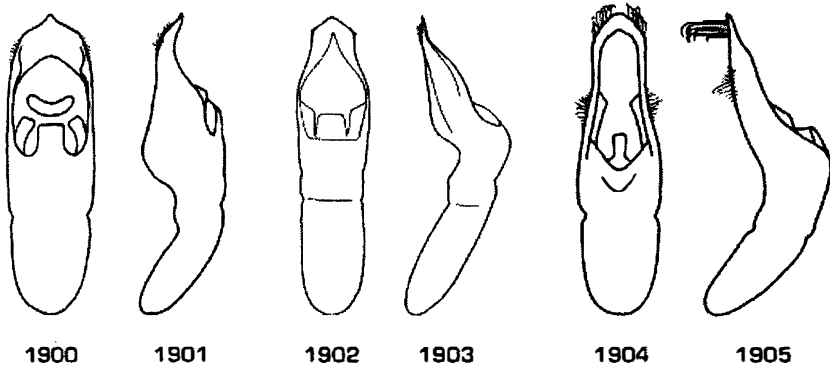


Figs. 1894-1899. Aedeagus in dorsal and lateral view: 1894, 1895 - *Pachybrachis* (*Pachybrachis*) ***pudicus*** (after LOPATIN 1984b); 1896, 1897 - *P. (P.) terminalis* (after PETITPIERRE 2000); 1898, 1899 - *P. (P.) bode-meyeri* (after WARCHALOWSKI 2003).

35. Body, except for dark yellow spots on head, black. Pronotum finely, very densely punctured, punctures of elytra strong and deep, somewhat rugose. Aedeagus as in figs 1892, 1893. Length 2.7-3.0 mm (male) to 3.4-3.5 mm (female) (= *mohri* LOPATIN, 1974). Described from basin of Amur ..... ***amurensis*** MEDVEDEV, 1973.
- Upper side black with yellow transversal stripe on apex of elytra, sometimes with very narrow yellow lateral margins of pronotum, elytra (anteriorly) and at scutellum. Yellow bordering at scutellum present almost always in male, rarely in female. General view as in plate XLVI, phot. 406. Aedeagus (figs 1896, 1897) very characteristic, its apical bristles form bent, horn-like wisps. Length 3.4-4.0 mm. Variation: elytra entirely black, without transversal stripe apically (ab. *martini* PIC, 1909). Distributed in Iberian Peninsula ..... ***terminalis*** SUFFRIAN, 1849.
36. Elytra black with relatively sparse yellowish pattern, consisting of little spots and narrow stripes, more or less distinctly elevated over surface and without punctures (see auxiliary group C).



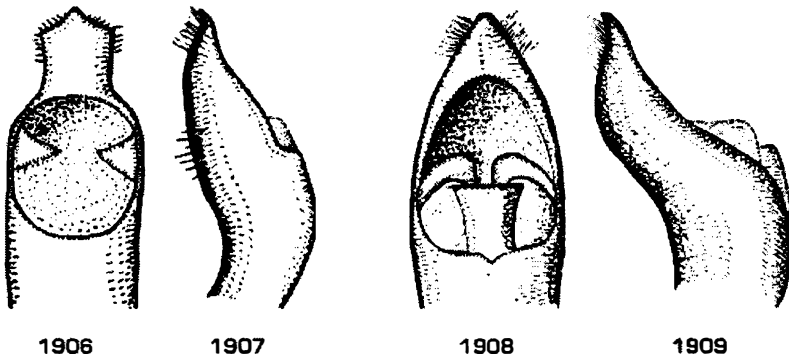
- Yellowish pattern broader, flat, usually sparsely dark punctate ..... **37**.
- 37. Length of body usually greater, 3.4–4.5 mm. Punctures of pronotum rather strong, not very densely and somewhat unevenly scattered ..... **38**.
- Length of body smaller, on average 2.2–3.2 mm. Punctures on pronotum finer, densely and regularly scattered ..... **46**.
- 38. Last quarter of elytra yellow, black spots form a H-like pattern (similar pattern present also in *sinuatus*, thesis 41 and *velarum*, antithesis 41). General view as in plate XLVI, **phot. 407**. Aedeagus as in figs **1898, 1899**. Length 3.3–3.8 mm. Variations: longitudinal stripes connected behind scutellum (typical form = ab. *anteconnexus* BURLINI, 1968), black pattern reduced, on each elytron humeral spot and traces of remaining spots (ab. *humeralis* BURLINI, 1968) only. Distributed in Asia Minor ..... **bodemeyeri** WEISE, 1906.
- Yellow area on last quarter of elytra smaller, more limited by black pattern ..... **39**.
- 39. Apex of aedeagus approximately triangular. Here variations of *catalonicus* and *albicans* (thesis and antithesis 12) with entirely black mesoepimeres.
- Apex of aedeagus formed differently ..... **40**.
- 40. Two last articles of palpi entirely black ..... **41**.
- Two last articles of palpi entirely or partly yellowish ..... **42**.



Figs. 1900-1905. Aedeagus in dorsal and lateral view: 1900, 1901 – *Pachybrachis (Pachybrachis) sinuatus* (after WARCHAŁOWSKI 1991); 1902, 1903 – *P. (P.) velarum* (after WARCHAŁOWSKI 1998); 1904, 1905 – *P. (P.) hippophaes* (after WARCHAŁOWSKI 1991).

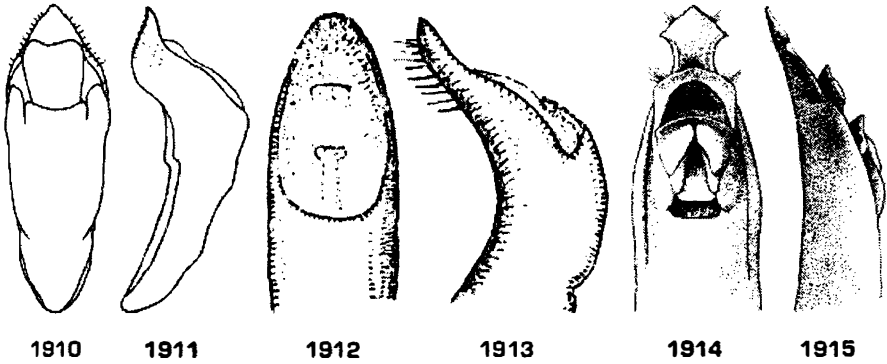
- 41. Hind tibiae basally pale. General view as in plate XLVI, **phot. 408**. On elytra external interval pale. Aedeagus as in figs **1900, 1901**. Length 3.2–3.8 mm (= *haliciensis* MILLER, 1868). Variation: black spots on elytra separated, anterior femora for the most part reddish (ab. *rufimanus* WEISE, 1882). Distributed in southern France, Middle Europa, Balkan Peninsula and Asia Minor ..... ***sinuatus*** MULSANT, 1859.
- Hind tibiae black. General view as in plate XLVI, **phot. 409**. On elytra external interval at least in the middle black. Aedeagus as in figs **1902, 1903**. Length 3.3–4.0 mm. Distributed in Asia Minor ..... ***velarum*** WARCHAŁOWSKI, 1998.

42. Apical bristles on aedeagus (figs **1904, 1905**) long, rigid, directed down. General view as in plate XLVI, **phot. 410**. Aedeagus as in. Length 3.2–3.8 mm. Variations: scutellum with pale spot, on elytra lateral spots 2 and 3 absent (ab. *galezii* PIC, 1910), scutellum black, on elytra lateral spots 2 and 3 reduced (ab. *lignosus* WEISE, 1882), elytra pale with sutural stripe and with three lateral spots black (ab. *pratensis* PIC, 1955). Distributed from northern Spain to Romania, occur mainly in mountains (Pyrenees, Alps, Carpathians) ..... ***hippophaes*** SUFFRIAN, 1848.
- . Apical part of aedeagus formed differently ..... **43.**
43. European species ..... **44.**
- . Species known from Asia Minor only. Black pattern on upper side as in *scripticollis* (thesis 10) or (when lateral spots on elytra present) as in pale aberrations of *hieroglyphicus* (thesis 17). Length 2.8–3.2 mm. Insufficiently studied species, perhaps conspecific with *scripticollis* ..... ***pentheri*** GANGLBAUER, 1905.
44. Apical part of aedeagus gradually arcuate narrowed. Colouration of body as in *hippophaes* (thesis 42) ..... **45.**
- . Apical part of aedeagus (figs **1906, 1907**) suddenly narrowed. Colouring of body as in *sinuatus* (thesis 41). Length 3.0–3.5 mm. Variation: the narrowed apical part of aedeagus longer than normally (subsp. *sibillinus* BURLINI, 1959, ?endemic to Monti Sibillini, Marche, Italy). Distributed in central and southern part of Italy ....  
..... ***ruffoi*** BURLINI, 1956.
45. Aedeagus (figs **1908, 1909**) in dorsal view not particularly broad. Length 3.0–3.6 mm (= *chiusafortensis* BURLINI, 1968). Distributed in nord-eastern Italy .....  
..... ***fraudolentus*** MÜLLER, 1955.
- . Aedeagus (figs **1910, 1911**) in dorsal view broad. General view as in plate XLVI, **phot. 411**. Length 3.5–4.0 mm. Described from High Alps .....  
..... ***alpinus*** RAPILLY, 1982.
46. Each elytron black, without spots, all round yellow margined. General view as in plate XLVI, **phot. 412**. Apical part of aedeagus (figs **1912, 1913**) gradually narrowed and broadly rounded. Length 2.3–2.8 mm. Endemic to Corsica and Sardinia ..... ***cinctus*** SUFFRIAN, 1848.
- . Elytra with yellowish spots ..... **47.**



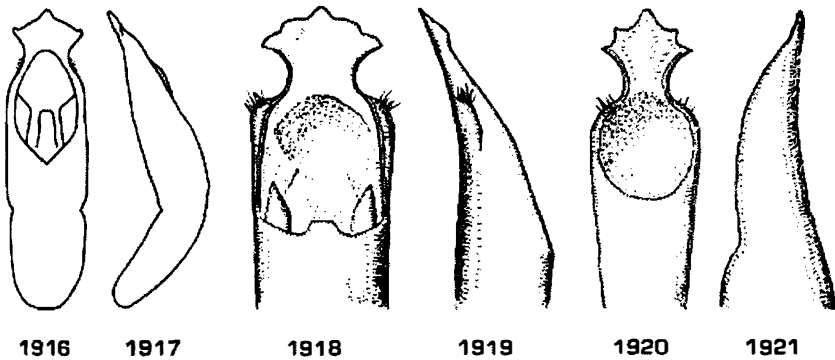
Figs. 1906-1909. Aedeagus in dorsal and lateral view: 1906, 1907 – *Pachybrachis (Pachybrachis) ruffoi* (after BURLINI 1968); 1908, 1909 – *P. (P.) fraudolentus* (after BURLINI 1968).

47. Apex of aedeagus laterally deeply emarginate, its anterior margin with five variously formed teeth or convexities (*fimbriolatus*-affinity) ..... 48.  
 -. Apex of aedeagus laterally not emarginate ..... 52.



Figs. 1910, 1915. Aedeagus in dorsal and lateral view: 1910, 1911 – *Pachybrachis (Pachybrachis) alpinus* (after RAPILLY 1982); 1912, 1913 – *P. (P.) cinctus* (after BURLINI 1968); 1914, 1915 – *P. (P.) danieli* (after PETITPIERRE 2000).

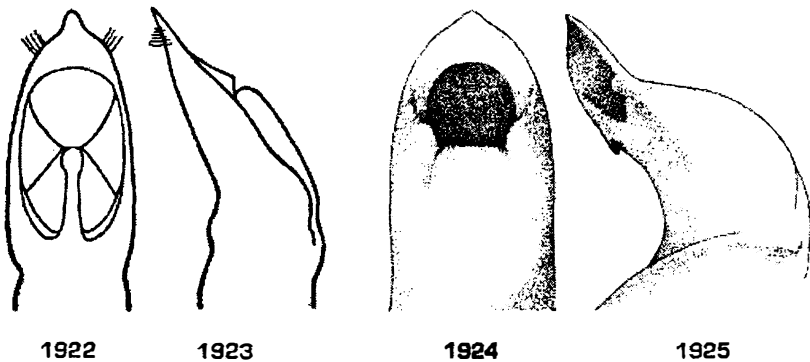
48. Anterior tarsi in male almost as long as corresponding tibiae ..... 49.  
 -. Anterior tarsi in male significantly shorter than corresponding tibiae ..... 50.



Figs. 1916-1921. Aedeagus in dorsal and lateral view: 1916, 1917 – *Pachybrachis (Pachybrachis) fimbriolatus* (after WARCHAŁOWSKI 1991); 1918, 1919 – *P. (P.) nitidicollis* (after BURLINI 1968); 1920, 1921 – *P. (P.) mendax* (after BURLINI 1968).

49. Last tarsomeron of anterior tarsi in male thickened apically. General view as in plate XLVI, **phot. 413**. Aedeagus as in figs 1914, 1915. Length 2.5–2.8 mm

- (= *ungiculatus* BURLINI, 1968). Perhaps a race of *fimbriolatus* (thesis 50). It was with mentioned species already formally synonymized by LOPATIN (1975: 197), but in account of existing doubts it is here discussed separately. Distributed in France and Spain ..... **danieli** BURLINI, 1968.
- . Last tarsomeron of anterior tarsi in male not thickened apically. Length 2.5–2.8 mm. Distributed in the Alps and in Piemonte ... **danieli** subsp. **assiettae** BURLINI, 1968.
50. Apex of aedeagus (figs 1916, 1917) laterally not very deeply emarginate. General view as in plate XVI, **phot. 141**. On elytra postmedian dorsal spot almost always absent. Length 2.5–2.8 mm (= *tristis* OLIVIER, 1808 nec LAICHARTING 1781, *mulsan-ti* PERRIS, 1852). Characterized by a geographical variability in shape of aedeagus (see *danieli*, thesis 49 and *nitidicollis*, thesis 51). General view as in plate XLVI, **phot. 414**. Variations: yellow pattern of upper side partly reduced (ab. *varanensis* PIC, 1913), upper side almost entirely black (ab. *weisei* BURLINI, 1968). One sub-species was described: puncturation of upper side stronger, colouration of elytra paler, aedeagus somewhat differently shaped (subsp. *sibiricus* LOPATIN, 1962). Distributed in southern and central part of Europa from northern Spain to Asia Minor and basin of Volga, subspecies *sibiricus* described from Siberia ..... **fimbriolatus** SUFFRIAN, 1848 s. str.
- . Apex of aedeagus laterally very deeply emarginate ..... 51.



Figs. 1922-1925. Aedeagus in dorsal and lateral view: 1922, 1923 – *Pachybrachis (Pachybrachis) merken-sis* (after LOPATIN 1968); 1924, 1925 – *P. (P.) antigae* (after PETITPIERRE 2000).

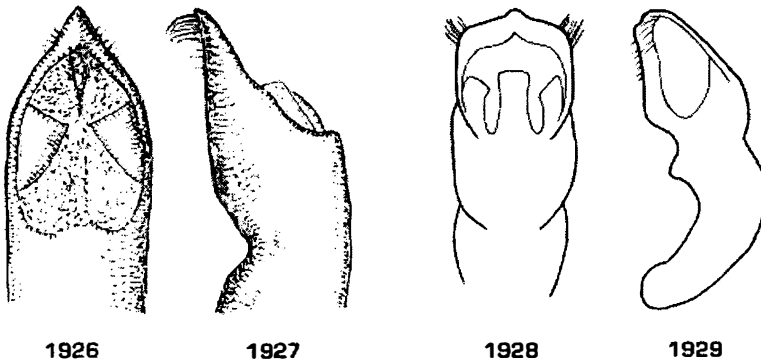
51. Aedeagus broader (figs 1918, 1919) Punctures of pronotum relatively finer and less densely scattered. On elytra usually a little, yellowish, postmedian spot. Length 2.4–2.9 mm. Distributed in Central Asia, reported also from Asia Minor. Perhaps, similarly as *danieli* (thesis 49), a race of *fimbriolatus* (thesis 50) ..... **nitidicollis** WEISE, 1894.
- . Aedeagus slender (figs 1920, 1921). Punctures of pronotum relatively stronger and more densely scattered. Generally lighter coloured than nominotypical sub-species, on elytra dorsal postmedian spot present. Length 2.3–2.8 mm (= *probus*

- WEISE, 1882, *dissecticeps* ROUBAL, 1916). Variation: mesoepimeres yellow (ab. *kislovodskensis* ROUBAL, 1916. Distributed in Ukraine, Asia Minor, Caucasian countries and in Central Asia. Perhaps a distinct species, see also remarks at *fimbriolatus* s. str. (thesis 50) ..... **mendax** SUFFRIAN, 1860.
52. Transcaspian species. Frons broader than diameter of upper part of eye. Externally similar to *distictopygus* (thesis 31). General view as in plate XLVII, **phot. 415**. Underside of aedeagus (figs **1922, 1923**) in lateral view without distinct convexity. Length about 3.0 mm. Described from S Kazakhstan ..... **merkensis** LOPATIN, 1968.
- SW European species ..... **51**.
53. Body smaller. Aedeagus as in figs **1924, 1925**. Yellowish pattern on upper side similar as in *fimbriolatus* (thesis 50). Length 2.0–2.5 mm. Distributed in eastern Spain ..... **antigae** WEISE, 1900.
- Body larger. Aedeagus as in figs **1926, 1927**. Colouring of upper side similar to *limbatus* (auxiliary group C, thesis 13). Length 2.5–3.0 mm (= ? *ogloblini* ROUBAL, 1927). Distributed in Italy, Istria and Dalmatia ..... **karamani** WEISE, 1893.

### Auxiliary group C

#### Key to species

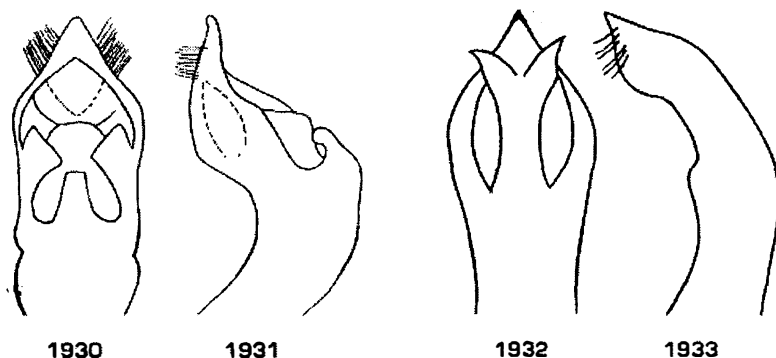
1. Mesoepimeres yellow, black with yellowish stripe or black with yellow spot ..... **2**.  
 -. Mesoepimeres black, sometimes at most with indistinct, blurred lightening ..... **6**.



Figs. 1926-1929. Aedeagus in dorsal and lateral view: 1926, 1927 – *Pachybrachis (Pachybrachis) karamani* (after BURLINI 1968); 1928, 1929 – *P. (P.) latipes* (after LOPATIN 1971).

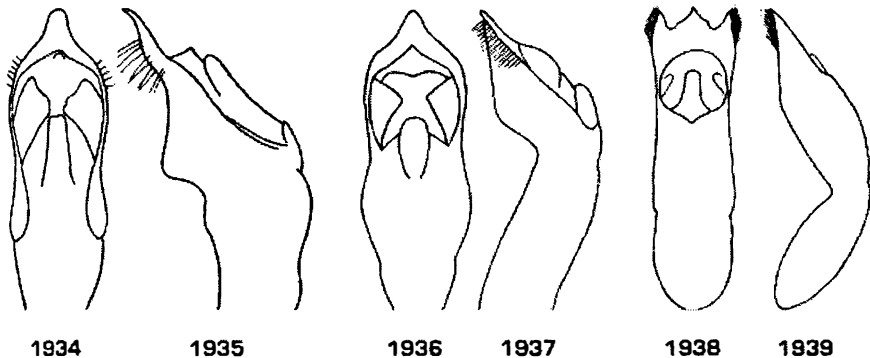
2. Frons broader than diameter of upper part of eye. Underside of aedeagus (figs **1922, 1923**) in lateral view without distinct convexity. See *merkensis* (auxiliary group B, thesis 52).  
 -. Frons narrower than diameter of upper part of eye. Underside of aedeagus in lateral view with distinct convexity or elevation ..... **3**.

3. Aedeagus (figs 1928, 1929) in dorsal view broad, almost transversely cut, with short and broad lamella, in lateral view its apex very thick. Puncturation of pronotum very dense and uniform, puncturation of elytra considerably stronger and more loosely scattered. Length 3.0–3.5 mm. Described from Mongol Altai mountains based on one couple only ..... *latipes* LOPATIN, 1971.
- . Aedeagus differently shaped ..... 4.
4. Apex of aedeagus (figs 1930, 1931) in dorsal view approximately triangular, in lateral view bent up. Black pattern on elytra partly fused, hind spots before apex form a horsehoe-shaped pattern. Pronotum with M-shaped black pattern, femora with darkened ventral- and dorsal margins, pygidium with two oval yellow spots. Puncturation of pronotum dense, particularly on black parts. Puncturation of elytra considerably stronger, on scutellar area random, on remaining part of elytra arranged in regular or semiregular rows. Length 3.5 mm. Described based on two males from mountains Chulak (E Kazakhstan) ..... *fraudator* LOPATIN, 1991.
- . Apex of aedeagus not bent up ..... 5.
5. Frons convex, in hind part not impressed. Body smaller and less convex. In male first tarsomere of anterior and mid legs not broadened. Aedeagus as in figs 1932, 1933. Length about 3.0 mm. Described from Tadzhikistan ..... *kuramensis* LOPATIN, 1974.
- . Frons flat, in hind part slightly impressed. Body larger. In male first tarsomere of fore and mid legs strongly broadened. General view as in plate XLVII, phot. 416. Aedeagus as in figs 1934, 1935. Length about 3.8 mm (male to about 4.0 mm (female). Described from SE Kazakhstan ..... *atraphaxidis* LOPATIN, 1968.
6. Apex of aedeagus laterally deeply emarginate, its anterior margin with three or five variously formed teeth or small lobes. On elytra yellow apical stripe not forked. See auxiliary group B, theses 48–51 (*fimbriolatus*-group)
- . Apex of aedeagus laterally not emarginate ..... 7.
7. Head with deep longitudinal furrow, frons divided into two separate convexities. Colouring of body like in *P. limbatus* (thesis 13). Length 3.5 mm. Here *dissecticeps* (ROUBAL, 1916) described from northern Caucasian foothills based on one specimen (sex not determined) only, later synonymized with *mendax*.
- . Head not divided into two convexities ..... 8.



Figs. 1930-1933. Aedeagus in dorsal and lateral view: 1930, 1931 – *Pachybrachis (Pachybrachis) fraudator* (after LOPATIN 1991); 1932, 1933 – *P. (P.) kuramensis* (after LOPATIN 1977a).

8. Species from Europe, Mediterranean area (Asia Minor and Caucasian countries included) and Iran ..... **9.**  
 -. Central- and E Asiatic species ..... **21.**  
 9. On elytra apical yellowish transverse stripe not forked ..... **10.**  
 -. On elytra apical yellowish transverse stripe forked. Yellowish pattern on pronotum and elytra as in *tessellatus* (thesis 17), but usually partly reduced. Last abdominal segment entirely black ..... **15.**  
 10. Species from Iran ..... **11.**  
 -. Species from E Mediterranean area. Here a few species externally very similar to each other, distinguishable by shape of aedeagus and to some extent by area of distribution ..... **12.**  
 11. An insufficiently known species, coloured similarly as *limbatus* (thesis 13), but smaller and yellow pattern weakly convex. Aedeagus not studied. Length 2.8–3.6 mm (= *misellus* WEISE, 1900, *callosus* SAHLBERG, 1913) ..... ***laticollis* SUFFRIAN, 1860.**  
 -. On pronotum anterior and lateral margins rust-yellow, at hind margin two oblique, short, blurred stripes. Elytron black, with yellow border, in the middle of lateral sides and on suture several times interrupted. In midlength, somewhat laterally, an irregular yellowish spot. Underside and pygidium entirely black. Legs partly blackened. Aedeagus as in figs **1936, 1937**. Length about 3.4 mm. Described from NE Iran (N Khorassan) ..... ***boreopersicus* LOPATIN, 1991.**

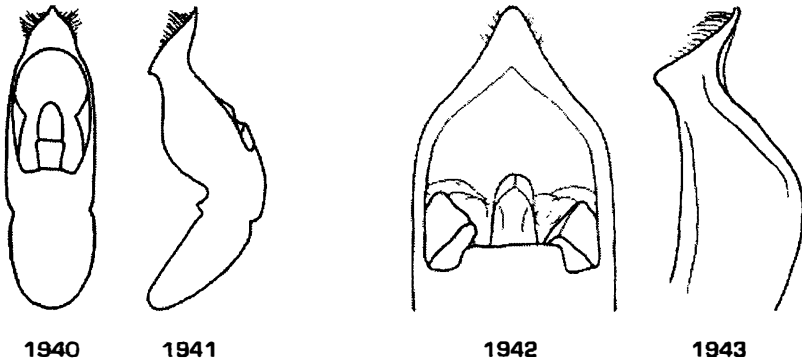


Figs. 1934-1939. Aedeagus in dorsal and lateral view: 1934, 1935 – *Pachybrachis (Pachybrachis) atraphaxidis* (after LOPATIN 1974); 1936, 1937 – *P. (P.) boreopersicus* (after LOPATIN 1991); 1938, 1939 – *P. (P.) mardinensis* (after WARCHAŁOWSKI 2003).

12. Apex of aedeagus (figs **1938, 1939**) with three approximately triangular processes (central lamella and two lateral angles). General view as in plate XLVII, **phot. 417**. Length of body 3.5–4.3 mm (= *seidenstueckeri* KIPPENBERG, 1974). Distributed in southern Turkey ..... ***mardinensis* WEISE, 1900.**  
 -. Apex of aedeagus simple, bent up ..... **13.**  
 13. Apex of aedeagus (figs **1940, 1941**). Ground of upper side black. General view as in plate XLVII, **phot. 418**. Pronotum anteriorly and laterally yellowish margined,

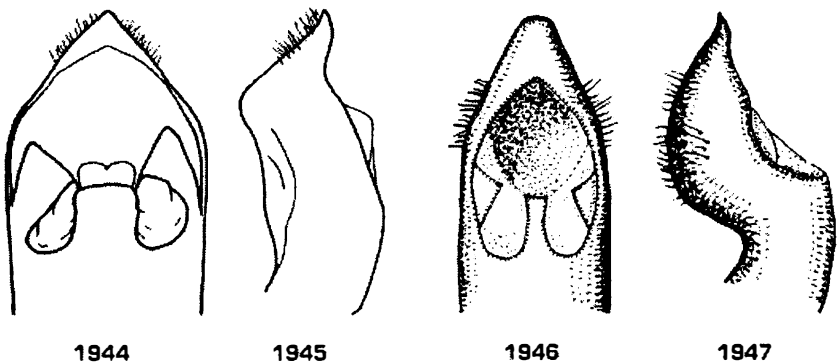
sometimes also with a very narrow median stripe. On each elytron epipleura (partly), anterior margin, two lateral and one apical stripes, alike a median spot near suture, yellow. Underside entirely black, mid and hind legs darkened. Length 3.2–3.8 mm. Variations: upper- and underside entirely black (ab. *ater* WEISE, 1882), pronotum less strongly punctate, poorly shining (ab. *maculatus* SUFFRIAN, 1848). Distributed in Balkan countries and in Asia Minor ..... ***limbatus*** (MÉNÉTRIÉS, 1836).

–. Apex of aedeagus differently shaped ..... 14.



Figs. 1940-1943. Aedeagus in dorsal and lateral view: 1940, 1941 – *Pachybrachis (Pachybrachis) limbatus* (after WARCHAŁOWSKI 1991); 1942, 1943 – *P. (P.) leonardii* (after SASSI and SCHÖLLER 2003).

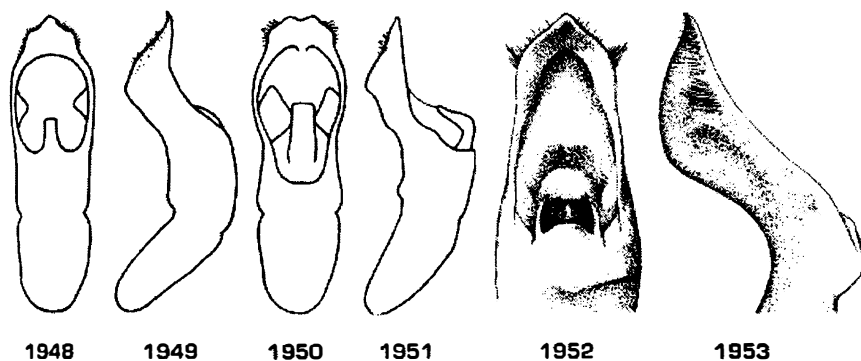
14. Apex of aedeagus as in figs 1942, 1943. Species distributed in Dodekanes (Rhodos, Kos) ..... ***leonardii*** SASSI et SCHÖLLER, 2003.  
 –. Apex of aedeagu as in figs 1944, 1945. Species distributed in S Turkey, Syria and Jordan ..... ***cordatus*** SASSI et SCHÖLLER, 2003.



Figs. 1944-1947. Aedeagus in dorsal and lateral view: 1944, 1945 – *Pachybrachis (Pachybrachis) cordatus* (after SASSI and SCHÖLLER 2003); 1946, 1947 – *P. (P.) freyi* (after WARCHAŁOWSKI 2003).

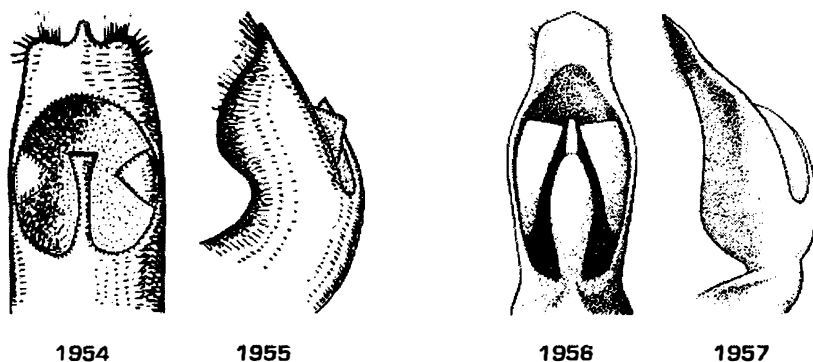


15. Apical part of aedeagus (figs 1946, 1947) regularly arcuately narrowed. Mid and hind femora blackish with pale apical spot. Length 3.0–3.5 mm (= *cephalenicus* BURLINI, 1968). Described from Greece ..... *freyi* BURLINI, 1957.  
 Apical part of aedeagus not regularly arcuately narrowed ..... 16.



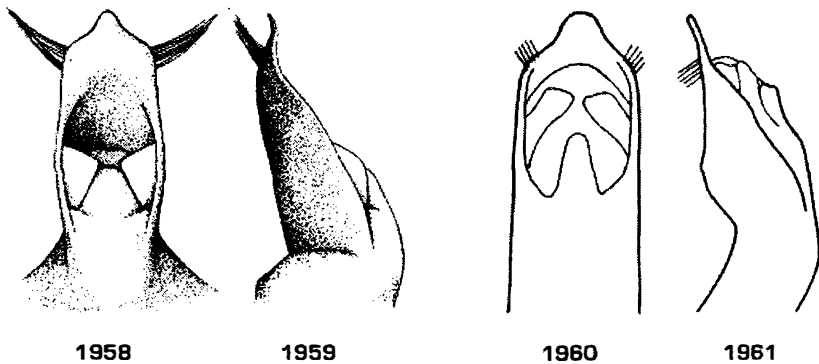
Figs. 1948-1953. Aedeagus in dorsal and lateral view: 1948, 1949 – *Pachybrachis (Pachybrachis) picus* (after WARCHAŁOWSKI 1991); 1950, 1951 – *P. (P.) tessellatus* (after WARCHAŁOWSKI 1991); 1952, 1953 – *P. (P.) aragonicus* (after PETITPIERRE 2000).

16. Apical part of aedeagus (figs 1948, 1949) shortly, sinuate narrowed, with a distinct tooth in the middle. Mid and hind femora fulvous. Length 3.0–3.5 mm. Distributed from northern Spain, central France and Belgium to Hungary and central Italy ..... *picus* WEISE, 1882.  
 -. Aedeagus formed differently ..... 17.



Figs. 1954-1957. Aedeagus in dorsal and lateral view: 1954, 1955 – *Pachybrachis (Pachybrachis) exclusus* (after BURLINI 1968); 1956, 1957 – *P. (P.) korbi* (after PETITPIERRE 2000).

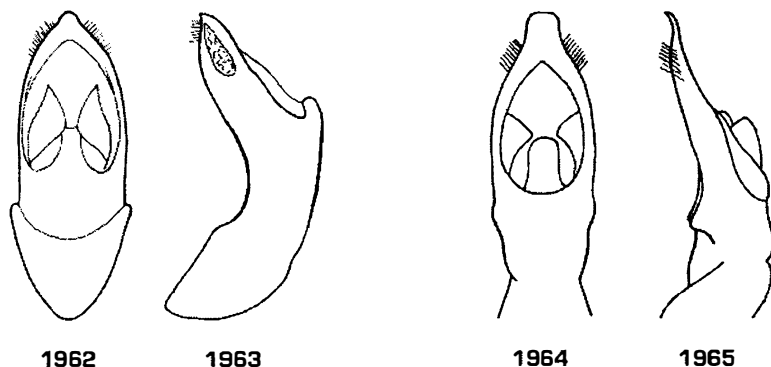
17. Apex of aedeagus (figs 1950, 1951) shallowly excised. General view as in plate XLVII, **phot. 419**. Great black spot on pronotum with lateral yellowish dot. Length 3.5–4.0 mm (= *tauricus* SUFFRIAN, 1848, *bisignatus* REDTENBACHER, 1849). Variations: a little smaller (3.3–3.8 mm), yellowish pattern pale flavous, aedeagus shorter (subsp. *orientalis* WEISE, 1894 occurring in Asia Minor), pygidium entirely black (ab. *melanopygus* MÜLLER, 1953), yellowish colour more extended; little spots of lateral stripes fused (ab. *picturatus* REY, 1883), yellowish colour very extended, on elytra both lateral stripes fused together (ab. *syriacus* WEISE, 1882), body entirely black except for mid and hind legs partly brownish (ab. *aethiops* WEISE, 1882). Distributed in southern and central part of Europe from northern Spain to the Caspian Sea ..... *tessellatus* (OLVIER, 1791).
- . Apex of aedeagus not excised, but shortly rounded or with a tooth in the middle .... 18.
18. Externally not differing from *tessellatus* (thesis 17), similar also to *picus* (thesis 16). Aedeagus as in figs 1952, 1953. Distributed in Pyrenees and in N Spain .... *aragonicus* TEMPÈRE et RAPILLY, 1981.
- . Apex of aedeagus differently formed ..... 19.



Figs. 1958-1961. Aedeagus in dorsal and lateral view: 1958, 1959 – *Pachybrachis (Pachybrachis) fulvipes* (after PETITPIERRE 2000); 1960, 1961 – *P. (P.) paganus* (after LOPATIN 1990).

19. Aedeagus as in figs 1954, 1955. General view as in plate XLVII, **phot. 420**. Great black spot on pronotum without lateral yellowish dot. Length 3.5–4.0 mm. Variations: aedeagus broader than in typical form, last abdominal sternite without yellowish spots (subsp. *etruscus* WEISE, 1886), yellowish colour more extended, on elytra interstices for the most part pale (subsp. *etruscus* ab. *liguricus* BURLINI, 1968), on the disc of elytra yellowish spots replaced by irregular longitudinal lines, mesoepimera with yellowish spots (a doubtful form, ab. *guilhemii* PIC, 1955). Sometimes considered as conspecific with *tessellatus* (thesis 17), in opinion of some authors here belongs also *lecerfi* PIC, 1947 from Morocco. Distributed from southern France to Dalmatia, subsp. *etruscus* occurs in Italy ..... *exclusus* REY, 1883.

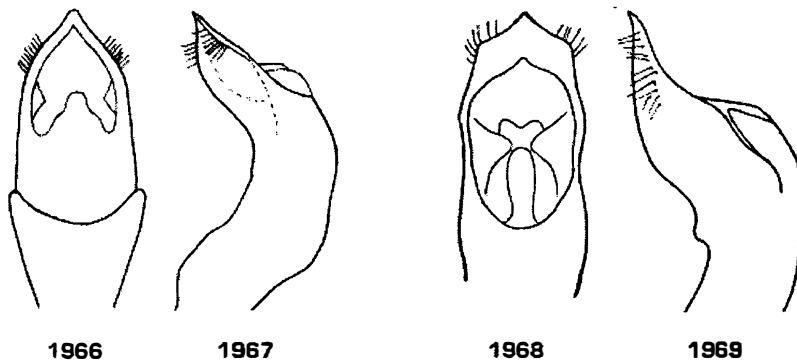
- Aedeagus formed differently, great black spot on pronotum usually with lateral yellowish dot ..... **20.**
- 20. Body length exceeding 3.2 mm. Apex of aedeagus (figs **1956, 1957**) shortly rounded, sometimes with a very little tooth in the middle. Length 3.4–4.1 mm (= *alcarriensis* BURLINI, 1968). Distributed in Spain ..... **korbi** WEISE, 1891. Body length not exceeding 3.2 mm. Upper side black with sparse yellowish pattern. Apex of aedeagus (figs **1957, 1958**) with a rather great, obtuse lamella, apical bristles forms horn-like wisps. General view as in plate XLVII, **phot. 421**. Length 2.8–3.0 mm. One subspecies was described: two yellowish spots in posterior part of pronotum situated at some distance before posterior margin, on elytron anterior margin and a little yellowish spot on humerus only (subsp. *albarracinus* WAGNER, 1927). Variation (often confused with *terminalis*, auxiliary group B, antithesis 35): elytra black with narrow pale marginal stripe only (ab. *albolimbatus* WEISE, 1891). Distributed in SW Spain (nominotypical subspecies) and in NE Spain (subsp. *albarracinus*) ..... **fulvipes** SUFFRIAN, 1848.
- 21. Pronotum moderately strongly, but very densely punctured, interstices at most as broad as diameter of punctures. Externally similar to *atraxididis* (plate I, **phot. 4**). Aedeagus as in figs **1960, 1961**. Length about 3.0 mm (male) to 3.4 mm (female). Described from S Kazakhstan ..... **paganus** LOPATIN, 1990.
- Pronotum not particularly densely punctured, interstices on average broader than diameter of punctures ..... **22.**



Figs. 1962-1965. Aedeagus in dorsal and lateral view: 1962, 1963 – *Pachybrachis (Pachybrachis) tuvensis* (after LOPATIN 1995); 1964, 1965 – *P. (P.) koktumensis* (after LOPATIN 1991).

- 22. Aedeagus (figs **1962, 1963**) with a low carina on underside of apical part. In male first tarsomere of fore legs very feebly elongate, broadened but not rounded. Length 3.0–3.4 mm (male) to 3.9–4.0 mm (female). Pronotum in male yellow with M-shaped black pattern, in female black, its lateral and anterior margins and thin shortened median stripe pale yellow. General view as in plate XLVII, **phot. 422**. Described from Tuva ..... **tuvensis** MEDVEDEV, 1974.

- Aedeagus without carina on underside of apical part ..... 23.
- 23. Puncturation of elytra almost entirely random, along lateral sides arranged in a row, interrupted behind humeral callus. Upper side yellow, on pronotum M-shaped pattern, on elytra large, black, partly fused spots. Yellow parts of elytral surface distinctly convex. Aedeagus (figs 1964, 1965) on apex with a broad, almost transversely cut lamella. Length 2.9–3.0 mm (male) to 3.6–3.7 mm (female). Described from SE Kazakhstan ..... *koktumensis* LOPATIN, 1991.
- Puncturation of elytra in hind half at least partly arranged in regular or semiregular rows. Pronotum black, its lateral and anterior margins and thin shortened median stripe pale yellow ..... 24.



Figs. 1966-1969. Aedeagus in dorsal and lateral view: 1966, 1967 – *Pachybrachis (Pachybrachis) korotjaevi* (after LOPATIN 1995); 1968, 1969 – *P. (P.) sericans* (after LOPATIN 1974).

- 24. On average smaller. Legs dark yellow, femora on apex whitish. In male first tarsomere of fore legs strongly elongate and broadened, slightly rounded. Yellowish pattern on elytra partly chain-like. Aedeagus as in figs 1966, 1967. Length 3.1–3.2 mm. Described from Tuva ..... *korotjaevi* LOPATIN, 1995.
- On average larger. Legs darker, femora partly black, with large dark yellow spot at apex. Elytra black with yellow pattern consisting of thin short stripes and chains. General view as in plate XLVII, phot. 423. Aedeagus as in figs 1968, 1969. Length 3.0–4.0 mm. Distributed from Kyrgyzstan and E Kazakhstan to Altai, Mongolia and Transbaicalia ..... *sericans* SUFFRIAN, 1860.

Genus *Stylosomus* SUFFRIAN, 1848

Literature: WARCHALOWSKI 2006.

Key to subgenera

- 1. Primary puncturation of elytra arranged in regular rows, at most here and there insignificantly confused ..... *Stylosomus* s. str. (p. 365)

- Primary puncturation of elytra entirely or partly (in anterior part and along the suture) randomly scattered ..... 2.
- 2. Claw tarsomere about  $2 \times$  longer than tarsomere 3, tarsi shorter than tibiae ..... *Microsomus* (p. 363).
- Claw tarsomere 3–4  $\times$  longer than tarsomere 3, tarsi approximately as long as tibiae ..... *Microstilus* (p. 364).

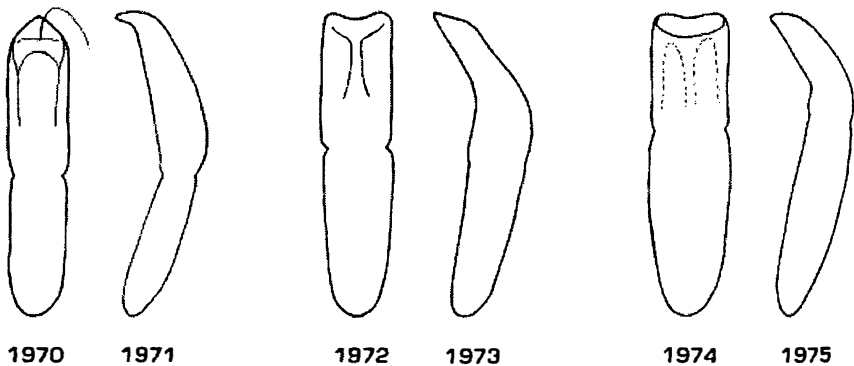
Subgenus *Microsomus* BURLINI, 1957

Key to species

1. Along fourth interval of elytra runs a slightly convex, in anterior part paler coloured costa. Pronotum narrowed anteriorly, with oblique impression near fore angles. Upper side brown or grey-brown, with small, irregular lightenings on elytra. Elytra sometimes darkened in apical half. General view as in plate XLVIII, **phot. 424**. Aedeagus not studied. Length 2.0–2.7 mm. Distributed in Kirgystan and E Uzbekistan ..... *costatus* LOPATIN, 1962.
- Elytra without costae, pronotum without impressions ..... 2.
2. Upper side with dense, scale-like, adpressed, silvery hairs, covering ground of elytra and their sculpture. Upper side in female brown, vertex, pronotum and often a broad transverse band in hind part of elytra pitchy. In male upper side darker, usually pitchy, blackish or black. Legs yellow with brown or blackish tarsi. General view as in plate XLVIII, **phot. 425**. Aedeagus not studied. Length 2.2–2.9 mm (= *bechynei* BURLINI, 1957, *hirsutus* LOPATIN, 1961). Distributed in E Kazakhstan and W Mongolia ..... *major* BREIT, 1919.
- Upper side covered by short, semierect or erect, thin, not very dense hairs, not covering ground of elytra. Pronotum without oblique impressions ..... 3.
3. Pronotum long, subquadrate. Colouration of upper side rather uniform, reddish-brown, pronotum and anterior part of elytra often slightly darkened, vertex and tarsi sometimes blackish. General view as in plate XLVIII, **phot. 426**. Aedeagus as in figs 1970, 1971, similarly shaped as in *tamarisci* (antithesis 18), but anterior part of lamina dorsalis (in genus *Stylosomus* always fused with operculum) distinctly broader and flagellum usually protruding. Length 2.2–2.6 mm. Distributed in southern Ukraine and in southern Russia ..... *cylindricus* MORAWITZ, 1860.
- Pronotum transverse, at least  $1.4 \times$  broader than long. Upper side densely and rather finely punctured. Upper side rusty-brown, with darker, sometimes blackish, blurred spots, lateral and central area of elytra between humeral callus and midlength always paler than basal or preapical parts. General view as in plate XLVIII, **phot. 427**. Aedeagus not studied. Relatively large species, length 2.0–2.9 mm (= *amoenus* SAHLBERG, 1913 nec PIC, 1909, *sublineatus* SAHLBERG, 1913, *sahlbergi* WINKLER, 1929). Distributed in E Kazakhstan, Uzbekistan, Tadzhikistan and Kirgystan ..... *weberi* REITTER, 1905.

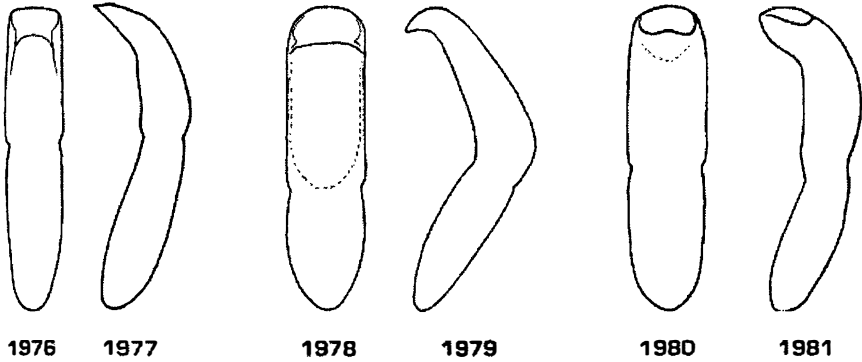
Key to species

1. Upper side entirely black or black with a pale spot on apex of elytra ..... 2
- . Upper side brown or black with testaceous pattern ..... 5
2. Elytra covered by very sparse and short hairs, almost or entirely glabrous. Pronotum impressed in the middle and along posterior margin. Upper side black, femora and tibiae reddish, tarsi brown or blackish. Aedeagus as in *minutissimus* (thesis 4). Length 1.6–2.2 mm. Leaves on *Quercus*. Distributed in Iberian Peninsula, southern France and northern Italy ..... *ilicicola* SUFFRIAN, 1848.
- . Elytra covered by distinct, semierect hairs, partly arranged in longitudinal rows ..... 3
3. W Mediterranean species ..... 4
- . Species from C. Asia. Pronotum relatively long, the ratio breadth/length less than 1.5 ×. Remaining external characters as in *rugithorax* (antithesis 4). General view as in plate XLVIII, **phot. 428**. Aedeagus not studied. Length 1.8–2.6 mm. Distributed in Kazakhstan and Usbekistan ..... *ater* LOPATIN, 1962.
4. Body very small. Pronotum with one transverse, shallow impression along posterior margin only. Upper side black, femora and tibiae reddish, tarsi brown or blackish. Aedeagus as in figs 1972, 1973, its tubular part at least 2 × longer than broad. Length 1.2–1.5 mm (= *depilis* ABEILLE, 1877, *lutetianus* SAINTE-CLAIRE DEVILLE, 1938). Variation: apex of elytra pale (ab. *terminalis* FUENTE, 1907). Distributed in southern Europe from Portugal to Balkan Peninsula, reported also from NW Africa ..... *minutissimus* (GERMAR, 1824).
- . Larger, body coloured as in *ilicicola* (thesis 2). Ratio length/breadth of pronotum more than 1.5. Upper side rather strongly punctured. In aedeagus (figs 1974, 1975) tubular part very short, about 1.5 × longer than broad, with two longitudinal impressions dorsally. Length 1.8–2.2 mm. Distributed in S France, Pyrenees and N Spain ..... *rugithorax* ABEILLE, 1877.



Figs 1970–1975 (after WARCHAŁOWSKI 2007): 1970, 1971 – *Stylosomus (Microsomus) cylindricus*; 1972, 1973 – *S. (Microstilus) minutissimus*; 1974, 1975 – *S. (M.) rugithorax*.

5. Species described from C Asia. Body somewhat stout, elytra covered by sparse and short hairs, randomly and rather finely punctured. Upper side pale reddish-brown, on elytra undefined large lightenings just before midlength and in apical part. General view as in plate XLVIII, **phot. 429**. Aedeagus not studied. Length 2.0–2.6 mm. Distributed in mountains of Tadjikistan ..... *tadzhicus* LOPATIN, 1965.  
 -. W Mediterranean species ..... **6**.



Figs 1976-1981 (after WARCHAŁOWSKI 2007): 1976, 1977 – *Stylosomus (Microstilus) ericeti*; 1978, 1979 – *S. (Stylosomus) bi partitus*; 1980, 1981 – *S. (S.) biskrensis*.

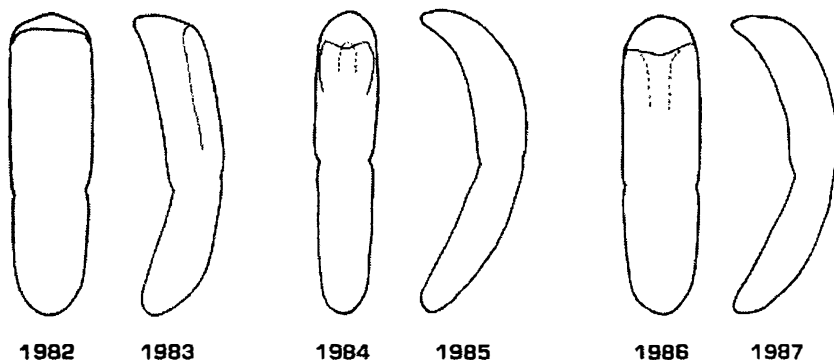
6. Posterior margin of pronotum and anterior margin of elytra black and strongly elevated, forms two approached parallel ridges. Upper side brown or blackish brown with testaceous pattern. General view as in plate XLVIII, **phot. 430**. Aedeagus as in figs **1976, 1977**. Length 1.8–2.4 mm (= *bituberculatus* DESBROCHERS, 1870, *constrictus* SCHAUFUSS, 1861). Distributed in Iberian Peninsula ..... *ericeti* SUFFRIAN, 1851.  
 -. Margins of pronotum and elytra nowhere particularly strong elevated. Upper side blackish, partly (anterior part of head, borders of pronotum narrowly, elytra at basis and largely at apex) testaceous. Male unknown. Length 2.0 mm. Described from Morocco ..... *maroccanus* PIC, 1950.

Subgenus *Stylosomus* s. str.

Key to species

1. E Palaearctic species ..... **2**.  
 -. W Palaearctic species ..... **3**.  
 2. Upper- and underside entirely black, sometimes with weak metallic shine. Femora and tarsi yellowish, tarsi darkened, antennomeres 1–4 or 1–5 yellow, remaining blackish. Primary punctuation of elytra very regular. General view as in plate

- XLVIII, **phot. 431**. Aedeagus not studied. Length 2.1–2.4 mm (= *sinensis* LOPATIN, 1956). Distributed in N China (Kansu) and Mongolia .... **submetallicus** CHEN, 1941.
- . Upper- and underside never entirely black Upper side yellowish to reddish-brown, except basal margins of elytra and pronotum. Elytra finely punctured, rather densely covered by adpressed or subadpressed hairs, arising not only from primary punctures, but also from intervals. Aedeagus not studied. Length 2.0–2.2 mm. Described from NE China (Suiyuan, Hopei) ..... **vestitus** CHEN, 1941.
3. Upper side distinctly bicolorous: head and pronotum reddish, elytra black. Vertex laterally brown, legs orange reddish with piceous or black tarsi. General view as in plate XLVIII, **phot. 431**. Apex of aedeagus (figs 1978, 1979) obtusely rounded, on both sides of opening small, tooth-like broadenings. Length 1.7–2.2 mm. Distributed in Algeria ..... **bipartitus** FAIRMAIRE, 1867.
- . Body differently coloured ..... 4
4. General view as in plate XLIX, **phot. 433**. In male on both sides of scutellum a brown or blackish spot, in middle of elytra a broad, jagged, transverse patch. Pronotum usually brownish with two great, fulvous spots in posterior part. In female dark pattern of upper side is reduced, blurred and pale. Abdomen in female testaceous, in male dark brown or blackish. Aedeagus as in figs 1980, 1981. Length 2.2–2.5 mm (male) to 2.4–2.7 mm (female). Distributed in Algerian subdesert area ..... **biskrensis** REY, 1883.
- . Upper side differently coloured ..... 5



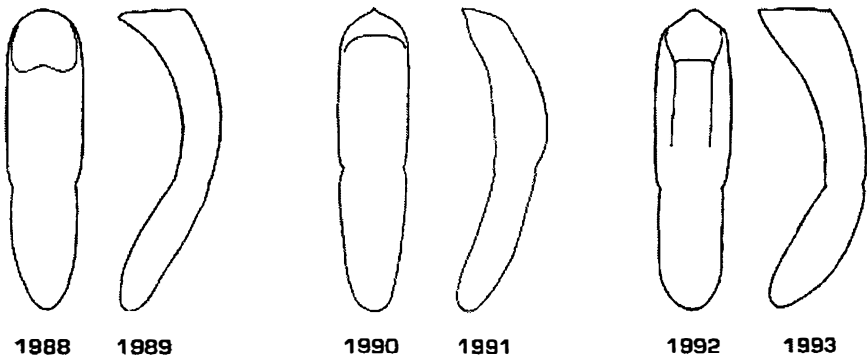
Figs 1982–1987 (after WARCHALOWSKI 2007): 1982, 1983 – *Stylosomus (Stylosomus) arnoldi*; 1984, 1985 – *S. (S.) subelongatus*; 1986, 1987 – *S. (S.) nigrifrons*.

5. At least anterior part of elytra entirely black. Pronotum often with pale area along hind margin or entirely black. Upper side of body generally black, clypeus and sometimes anterior part of frons pale, hind part of pronotum and apex of elytra often lightened, legs yellow with black or blackish tarsi. Length of body 1.7–2.2 mm. General view as in plate XLIX, **phot. 434**. Aedeagus as in fig. 1982, 1983. Described from Tunisia ..... **arnoldi** WARCHALOWSKI, 2006.
- . Upper side differently coloured ..... 6



6. Body entirely reddish fulvous, with two blackish transversal stripes on elytra: anterior stripe (narrower) behind scutellum, posterior (broader) behind middle. Both stripes often divided into several little spots. Aedeagus not studied. Length 1.9–2.3 mm. Distributed in the Canary Islands ..... ***biplagiatus*** WOLLASTON, 1864.
- Body differently coloured ..... 7.
7. Body bicolorous: head, pronotum and underside dark brown or blackish, elytra testaceous without distinct dark pattern, tarsi usually darkened. Body small and relatively narrow. Similar to darker coloured *nigrifrons*, but body on average smaller and fine reticulation of upper side distinct. General view as in plate XLIX, **phot. 435**. Aedeagus not studied. Length 1.5–1.9 mm. Described from Algeria ..... ***macer*** WEISE, 1882.
- Body not bicolorous, but usually pale fulvous with variable brownish or blackish pattern on vertex, pronotum and elytra, tarsi often darkened or blackish ..... 8.
8. Head and pronotum considerably more densely haired than elytra. Elytral pattern relatively pale, brownish. Sternum in the middle, tarsi and sometimes tibiae at the end blackish or black. Length 2.0–2.8 mm. See *pubescens*, thesis 16.
- Head and pronotum not or slightly more densely haired than elytra ..... 9.
9. Body rather slender. In the middle of elytron interstices 4–6 not broader than diameter of punctures. Sternum blackish, abdomen fulvous. Colouring of upper side relatively pale, blackish pattern usually limited to a narrow sutural stripe only. Aedeagus as in figs **1984, 1985**. Length 1.8–2.3 mm. Variations: suture not darkened, on hind part of vertex two blackish spots (ab. *notaticeps* PIC, 1914); a dark form: underside blackish, sutural stripe broad, on pronotum a few dark spots (ab. *sidonius* PIC, 1913). Distributed in Near East and Asia Minor ..... ***subelongatus*** PIC, 1913.
- Body not distinctly slender. In the middle of elytron interstices 4–6 broader than diameter of punctures ..... 10.
10. Pronotum long, its lateral margins very feebly rounded, almost straight, elytra 1.9–2.2 × longer than pronotum. Body pale coloured, pronotum slightly darker than elytra, upper side without dark pattern, rarely on anterior part of pronotum large, blurred darkening only. Vertex in male black, in female pitchy, the dark colour usually encroaches on frons, in male often reaching to its anterior margin. Ground reticulation of upper side very shallow and indistinct. Apex of claw tarsomere and claws blackish. General view as in plate XLIX, **phot. 436**. Aedeagus as in figs **1986, 1987**. Length 1.9–2.5 mm (= *nigrifrons* FLEISCHER, 1909, nec PIC, 1909). Distributed in Transcaspia from Turkmenia to E Usbekistan ..... ***nigrifrons*** PIC, 1909.
- Pronotum shorter, its lateral margins more rounded, elytra at least 2.4 × longer than pronotum ..... 11.
11. Colouring of body usually very light, pale fulvous or pale testaceous, darkened are: abdomen in male, five apical antennomeres, apical part of tarsi and sometimes sternum only (see also *niloticus*, thesis 15). Exterior interstices of elytra strongly convex, covered with hairs shorter than double diameter of punctures. General view as in plate XLIX, **phot. 437**. Aedeagus not studied. Length 1.6–2.3 mm. Variations: hind part of vertex, suture and tarsi darkened (ab. *obscuritarsis* PIC, 1914), Distributed in Balcan Peninsula, Ukraine and southern Russia .... ***flavus*** MARSEUL, 1875.

- . Colouring of body darker, upper side usually with brownish or blackish pattern ...  
..... 12.
- 12. Head and pronotum entirely reddish, elytra pale testaceous with a black, in hind part suddenly shortened sutural stripe. Aedeagus as in figs 1988, 1989. Length 1.6–2.0 mm. Described from Mesopotamia ..... **erythrocephalus** SUFFRIAN, 1853.
- . Head darkened on vertex or on vertex and frons, except in immature or rare entirely pale specimens ..... 13.
- 13. Anterior margin of aedeagus with a small, sharp, almost dentiform or spine-like lamella. External characters as in *tamarisci* (antithesis 18) or *biskrensis* (thesis 4), but ground colour of upper side more rusty and dark pattern on elytra more blurred. General view as in plate XLIX, **phot. 438**. Aedeagus as in figs 1990, 1991. Length 1.7–2.1 mm. Described from Corse, known also from Provence and Sicily, distributed probably round of Tyrrhenian Sea ..... **corsicus** REY, 1883.
- . Anterior margin of aedeagus obtusely cut, rounded or broadly sharpened, never with small, sharp lamella ..... 14.
- 14. Species from Mesopotamia, Near East and Egypt. Upper side generally pale, dark pattern absent or brownish ..... 15.
- . Species from other area ..... 17.
- 15. Species described from Egypt. External characters correspond with pale forms of *tamarisci* (antithesis 18). Aedeagus not studied. Two colour aberrations were described: body almost entirely pale (ab. *tournieri* PIC, 1909), on each elytron two darker spots at base and one spot behind middle (ab. *multinotatus* PIC, 1909). Known from Egypt only, in opinion of some authors a race of *tamarisci* (antithesis 18) ..... **niloticus** SUFFRIAN, 1857.
- . Species from Near East (S Turkey, Mesopotamia) ..... 16.
- 16. Pronotum covered by hairs more densely than elytra. Length 2.0–2.8 mm. External characters as in *flavus* (thesis 11). Aedeagus not studied. Described from Mesopotamia, perhaps conspecific with *subelongatus* ..... **pubescens** PIC, 1913.
- . Pronotum not distinctly more densely pubescent than elytra. Similar to *flavus* (thesis 11), but more slender, intervals of elytral punctures narrower. See *subelongatus*, thesis 9.



Figs 1988-1993 (after WARCHAŁOWSKI 2007): 1988, 1989 – *Stylosomus (Stylosomus) erythrocephalus*; 1990, 1991 – *S. (S.) corsicus*; 1992, 1993 – *S. (S.) tamarisci*.

17. Species from Medirreanean area. Elytra under  $2.5 \times$  longer than pronotum .... **18.**
- Species from Transcaspia. Elytra over  $2.6 \times$  longer than pronotum ..... **19.**
18. In typical form pronotum with very weak darkenings only, almost entirely pale, on elytra black colour forms x-like pattern. General view as in plate XLIX, **phot. 439.** Aedeagus in dorsal view almost parallel, on apex slightly narrowed and transversely cut, flagellum shortly protruding; in lateral view gently bent, towards apex not thickened, but rather somewhat flattened. Distributed in NW Algeria, Morocco and S Spain ..... ***xsignum*** PIC, 1899.
- In typical form black colour does not form an x-like pattern. General view as in plate XLIX, **phot. 440.** Aedeagus (figs **1992, 1993**) on apex not rounded, but less or more shortly, obtusely triangular, its anterior part of lamina dorsalis relatively narrow, about  $2 \times$  narrower than the breadth of tubular part. In lateral view thickened towards apex. Exterior interstices of elytra rather flattened, covered with hairs longer than double diameter of punctures. In typical form upper side pale testaceous with two brownish spots on anterior part of pronotum and with blackish sutural stripe dilated in the middle. Tarsi and sternum blackish, abdomen in female testaceous, in male dark brown or blackish. Length 1.6–2.3 mm. Forms numerous colour variations: body entirely pale, underside and lateral sides of vertex slightly darkened (ab. *pallidicolor* PIC, 1909), upper side testaceous or yellowish, vertex darkened, pronotum with blurred, weak, inddefined darkenings, at scutellum a rather large, triangular or heart-like spot, prolonged into distinct sutural stripe (typical form), Elytra testaceous with blackish sutural stripe and with blackish spot in hind part of each elytron (ab. *leprieuri* PIC, 1923), upper side pale, on pronotum two black spots (sometimes fused), elytra as in ab. *leprieuri*, but blackish spots usually fused into a transverse band (ab. *cruciatus* WEISE, 1882), colouration of body as in *biskrensis* (thesis 4) (ab. *nigronotatus* PIC, 1909), coloured as *biskrensis* (thesis 4), but dark spots more confluent than in *nigronotatus* (ab. *trifasciatus* PIC, 1909, perhaps conspecific with *biskrensis*), a dark form, elytra pitchy or blackish, in basal part with reddish markings, apical part testaceous (ab. *rufonotatus* PIC, 1923), a melanotic form, pronotum entirely or partly darkened, elytra dark with pale apex (ab. *oberthuri* PIC, 1909). Distributed widely in western part of Mediterranean area from Morocco to Dalmatia. Reported also from different localities situated in Balkans, basins of Black and Caspian Sea and in Central Asia, probably based on misidentifications ..... ***tamarisci*** (HERRICH-SCHÄFFER, 1838).
19. Length of body over 3.0 mm (male about 3.0 mm, female about 3.4 mm). Pronotum and elytra dark brown or pitchy, yellowish margined. Aedeagus not studied. Described from Kirgызstan ..... ***cheni*** LOPATIN, 1962.
- Body on average shorter. Upper side pale, testaceous or pale rusty-brown, on pronotum often two blackish spots. Pronotum relatively short and broad. Punctuation of upper side very strong. General view as in plate XLIX, **phot. 441.** Aedeagus not studied. Length 2.6–3.0 mm. Distributed in SE Kazakhstan, E Uzbekistan and Kirgызstan ..... ***fausti*** REITTER, 1894

#### Genus *Suffrianus* WEISE, 1895

One species only. Externally similar to *Cryptocephalus (Burlinius) pallifrons* GYLLENHAL 1813 (vide), but differing by structure of claws and by penultimate interval on elytra

(on humeral callus) slightly but distinctly convex, sometimes almost costiform. Upper side black with greenish or bluish metallic reflex, basal part of antennae, fore and mid legs yellowish, hind legs blackish. Aedeagus not studied. Length about 2.0 mm. Described from NW China (Dauria), reported also from Kurile Isl. and E Siberia, often under mistaken names *pumillio*, *pumilo* or *pumilus* auct. .... ***pumilio*** (SUFFRIAN, 1854).

## Subfamily *Chlamisinae*

Subfamily *Chlamisinae* comprises 11 genera distributed in Neotropical and Palaeotropical regions. In Oriental and E Palaearctic subregions occur three genera *Chlamisus* RAFINESQUE, 1815 (= *Chlamys* KNOCH, 1801, nec RODING, 1798 [*Mollusca*], *Exema* LACORDAIRE, 1848 and *Hymetes* LACORDAIRE, 1848); in discussed area only genus *Chlamisus* is represented.

### Genus *Chlamisus* RAFINESQUE, 1815

A large genus, comprising over 400 species, distributed mainly in Neotropical region. In the discussed area occur 10 species.

#### Key to species

1. Pronotum or/and elytra at least marked with orange, red or brown ..... **2.**
- Pronotum and elytra uniformly black or black with bronzy reflex ..... **5.**
2. Upper side entirely rusty- brown or reddish, punctures and impressions usually blackish or at least darker suffused. Suture strongly convex. Length 3.5–4.2 mm. General view as in plate L, **phot. 442.** Distributed in E China (Hupeh, Kiangsi), Japan (Honshu, Kyushu), Ryukyu Islands and Taiwan .... **japonicus** (JACOBY, 1885).
- Upper side darker, ground colour black, tubercles and ridges on upper side reddish brown. Antennae and legs (or at least tarsi) relatively pale, yellowish or brownish ...  
..... **3.**
3. Length of body over 3.5 mm. Central part of pronotum with distinct narrow, often slightly sinuate, linear ridges. Body more stout, about 1.6–1.7 × longer than broad. Length 3.5–4.5 mm. Distributed in Japan (Honshu, Kyushu, Shikoku) and Taiwan ..... **lewisii** (BALY, 1873).
- Length of body under 3.5 mm, body more elongate, about 1.8–1.9 × longer than broad ..... **4.**
4. In male last abdominal sternit with two tufts of spinulae-like setae. Metasternal process transverse, its apical margin almost straight. Length 2.8–3.4 mm. Distributed in Japan (Honshu, Kyushu) ..... **laticollis** (CHŪJŌ, 1942).
- In male central part of pronotum irregularly without tufts of spinulae-like setae. Pronotum covered by tubercles, short ridges and strong reticulation. Tubercles on pronotum somewhat flattened, on elytra strongly convex. Length 2.7–3.5 mm. Distributed in Japan (Honshu, Kyushu, Shikoku) ..... **spilotus** (BALY, 1873).
5. Prosternal process with sides triangularly expanded before middle, consequently its apex distinctly angulate. Pygidium with four isolated longitudinal impressions. Length 2.2–2.8 mm. Distributed in E China from Kwantung to Chekiang, Japan (Kyushu), Korea and Taiwan ..... **diminutus** (GRESSIT, 1942).
- Sides of prosternal process straight or slightly rounded ..... **6.**
6. Central part of pronotum almost regularly convex, in lateral view evenly rounded, with shallow longitudinal median furrow and with two oblique furrows on each side. Length about 3.5 mm. Distributed in Japan (Shikoku, Yakushima) .....  
..... **yakushmanus** OHNO, 1961.
- Central part of pronotum unevenly convex, in lateral view not evenly rounded .... **7.**

7. Anterior border of pronotum distinctly covered by sparse, silvery hairs. Central part of pronotum strongly convex, without longitudinal ridges. Body black, antennae and tarsi yellowish or reddish, fore femora brown. General view as in plate I, **phot. 443**. Length 3.2–3.6 mm. Distributed in NE China (Kwantung), Ussuria and Korea ..... **pubiceps** (CHŪJŌ, 1940).
- . Anterior part of pronotum without hairs ..... 8.
8. Pronotum with numerous short ridges or tubercles (tu interjectus i geniculatus) ... ..... 9.
- . Pronotum on middle with two distinct longitudinal ridges; each of them produce two distinct oblique branches. Length 2.5–2.8 mm. Distributed in Japan (Honshu, Kyushu) ..... **consimilis** (CHŪJŌ, 1942).
9. Longitudinal furrows on pronotum not interrupted by any transverse ridge. Length 2.8–3.0 mm (= *cirsicola* CHŪJŌ, 1942). Distributed in Japan (Honshu, Kyushu) .... ..... **interjectus** (BALY, 1873).
- . Longitudinal furrows interrupted by transverse ridge at middle. Length 3.2–3.5 mm. Distributed in Japan (Kyushu, Yakushima), Ryukuy and Taiwan ..... **geniculatus** (JACOBY, 1896).

## Subfamily *Lamprosomatinae*

To subfamily *Lamprosomatinae* belong a few small genera and a large (about 160 species) neotropical genus *Lamprosoma* KIRBY, 1818. In discussed area two genera with 6 species.

### Key to genera

1. Claws simple inner margin of eye not emarginate ..... ***Oomorplus*** (p. 373).
- Claws appendiculate, inner margin of eye more or less distinctly emarginate .....  
..... ***Oomorphoides*** (p. 373).

### Genus *Oomorplus*, 1831

To the genus *Oomorplus* belong two species only.

### Key to species

1. Body oval, entirely black with very weak bronzy reflex. Apex of mandibulae and antennomere 2 reddish. Upper side glabrous, shining. Pronotum uniformly covered by fine puncturation and finely reticulate. Primary punctures on elytra arranged in regular rows, secondary punctulation of intervals forms indistinct, longitudinal stripes. General view as in plate L, **phot. 444**. Length 2.0–3.0 mm (= *maritimus* STEPHENS, 1829, *unicolor* BRULLÉ, 1934). Variations: body larger, puncturation of upper side moderately fine (typical form), body smaller (2.0–2.3 mm), upper side more finely punctate (ab. *kolbei* SCHOLZ, 1926). Lives on *Umbelliferae* (*Apiaceae*) mostly in subalpine woods. An umbrophilous species. Distributed mainly in W and Central Europe, reported also from Ukraine and Caucasian countries .....  
..... ***concolor*** (STURM, 1807).
- Very similar to *concolor* (thesis 1), but stronger punctured; metallic reflex more distinct, usually cupreous, rarely bluish. Length 2.7–2.9 mm. Distributed in Japan (Honshu, Kyushu, Shikoku) ..... ***japanus*** JACOBY, 1885.

### Genus *Oomorphoides* MONROS, 1956

Genus *Oomorphoides* contains several species, distributed around of East China Sea from Ussuria and Korea to Taiwan, and in N China. In discussed area four species.

### Key to species

1. Antennae entirely black. Proepimeron with numerous, distinct tubercles .....  
..... ***cupreatus*** (BALY, 1873).
- Antennae at least in basal part reddish or brownish. Proepimeron without any distinct tubercles or with a few obsolete ones ..... **2**.
2. Body relatively large, lateral margin of pronotum very feebly rounded, almost straight. Upper side uniformly black with very feeble bluish reflex. Length 2.8–3.8 mm.

Distributed in Japan (Hokkaido, Honshu, Kyushu, Shikoku). In opinion of some authors conspecific with *confucii*, but it is almost surely a distinct species .....

..... ***nigrocaeruleus*** (BALY, 1873).

- Body on average smaller, lateral margin of pronotum distinctly rounded ..... 3.
- 3. Antennomere 3 reddish at base. Head not pubescent, primary elytral punctures moderately strong or fine. Body broadly ovate. Length 2.6–3.4 mm. Distributed in Ussuria, ?Korea and N China (Kansu) ..... ***confucii*** (WEISE, 1889).
- Antennomere 3 entirely pitchy. Head pubescent, primary elytral punctures strong and dense. Body not very broadly ovate. Length about 3.0 mm. Described from N China (Kansu) ..... ***piliceps*** CHEN, 1940.



## Subfamily *Synetinae*

Subfamily *Synetinae* contains two genera: *Thricolema* CROTCH, 1874 (Nearctic) and *Syneta* CHEVROLAT, 1837 (Holarctic). In discussed area one genus only.

### Genus *Syneta* LACORDAIRE, 1845

#### Key to species

1. Each side of prothorax with two small teeth only. Length about 7.0 mm. Distributed in W China (NE Sikang, Sichuan) ..... ***ventralis*** GRESSIT, 1942.
- Each side of prothorax with a larger central tooth and some smaller separate ones ..... **2.**
2. Humeral costa short, reaching to 1/4 or 1/3 of elytral length. Epipleura convex with a row of punctures somewhat distant from inner margin ..... **3.**
- Humeral costa long, reaching to apical part of elytra. Epipleura flat with a row of punctures running just at inner margin. Colouration of body mostly darker as in *betulae*. General view as in plate L, **phot. 445**. Length 4.0–7.0 mm (= *major* NAKANE, 1963). Distributed in E Siberia, Korea and N China, sometimes considered as E Palearctic subspecies of *betulae* (thesis 3) ..... ***adamsi*** BALY, 1877.
3. Larger, hind tibia in male not widened at apex. General view as in plate L, **phot. 446**. Body oblong, a little flattened, lateral sides of pronotum denticulate, tarsomere 3 deeply incised, bilobed. Upper side pale brownish, elytral suture and underside darker. Puncturation of upper side strong, elytra randomly punctate with 4–5 fine longitudinal costae. Variations: head black, suture and lateral margins of elytra darkened (unnamed), body black, on each elytron a median, longitudinal, brownish stripe (unnamed), body entirely pale brownish (unnamed). Lives on birches (*Betula* L.). Length 5.0–7.5 mm (= *amurensis* PIC, 1901). Subpolar species, distributed in Fennoscandia, Siberia and NE China ..... ***betulae*** (FABRICIUS, 1792).
- Small, hind tibia in male widened at apex, remaining characters as in *betulae*. Length 3.8–4.5 mm. Known from Honshu (Japan) only ..... ***brevitibialis*** KIMOTO, 1971.

## Subfamily *Eumolpinae*

### Key to tribes

1. Pygidium with a median groove ..... *Colasposomatini* (p. 408).
- . Pygidium without a median groove ..... 2.
2. Upper side glabrous or very sparsely covered by hairs ..... 3.
- . Upper side rarely glabrous, usually covered by hairs, setae or scales .....  
..... *Adoxini* (p. 376).
3. Puncturation of elytra arranged in longitudinal rows. Mid and hind tibiae distinctly emarginate subapically ..... *Nodinini* (p. 412).
- . Puncturation of elytra random or arranged in very irregular rows. Mid and hind tibiae not or indistinctly emarginate subapically ..... *Eumolpini* (p. 410).

### Tribe *Adoxini*

The unclear genus *Damasus* CHAPUIS, 1874 from Syria (p. 384) only tentatively included in the key.

### Key to genera

1. Tarsal claws simple, shortly incised, appendiculate or with a small tooth in the middle ..... 2.
- . Tarsal claws bifid ..... 15.
2. Claw tarsomere long, not shorter than 2+3 ..... 3.
- . Claw tarsomere not very long, as long or shorter than 2+3 ..... 20.
3. Body pale coloured, yellow or yellowish-grey, unicolorous or with dark pattern. Length of body 5.0–8.0 mm ..... *Aphilenia* (p. 380).
- . Body piceous or blackish with weak metallic reflex ..... 4.
4. Body piceous. Humeral calli protruding. Mid femora with a sharp tooth beneath. Length of body 4.0–6.0 mm ..... *Adoxinia* (p. 379).
- . Body blackish with weak metallic reflex. Humeral calli rounded, distinct but not protruding, outline of elytra oval. Length of body 2.7–5.0 mm ... *Callipta* (p. 382).
5. Head with eyes broader than pronotum. Pronotum covered by transverse rugosities. Upper side dark cupreous or dark bronzy. Length of body under 3.0 mm ...  
..... *Phortus* (p. 405).
- . Head with eyes not broader than pronotum ..... 6.
6. Pronotum as broad as elytra, rather flattened, transverse, mid and hind tibia simple, without emargination before apex ..... 7.
- . Pronotum convex, cylindrical, sometimes almost subspherical, elytra with protruding humeral calli ..... 9.
7. All tibiae, but mid- and hind tibia stronger, tooth-like widened. Puncturation of elytra arranged in regular, strong rows. Body entirely rusty-reddish coloured. Length 4.1–6.0 mm ..... *Rhodopaea* (p. 405).
- . Tibiae not tooth-like widened. Body never entirely rusty-reddish ..... 8.
8. Upper side without pubescence, metallic shine strong ..... *Colaspinella* (p. 384).
- . Upper side covered by short hairs, metallic shine absent or moderately stron

- (= *Andosiomorpha* LOPATIN, 1981, *Bezdekia* WARCHALOWSKI, 2005) .....  
 ..... ***Iranomolpus*** (p. 386).
9. All tibiae, but mid- and hind tibia stronger, tooth-like widened. Body colouring shiny metallic, 4.5–7.0 mm long. Species from E Asia ..... ***Acrothinium*** (p. 378).  
 - Tibiae not tooth-like widened ..... **10**.
10. Lateral sides of prothorax without marginal ridge or with a shortened ridge, present in hind part only ..... ***Macrocoma*** (p. 387).  
 - Lateral sides of prothorax with complete marginal ridge or at least with a sharp crease, distinctly separating pronotum from its epipleuron ..... **11**.
11. Elytral punctures arranged in regular rows ..... **12**.  
 - Elytra confusedly punctured ..... **13**.
12. Pronotum broadest in anterior part or in the middle ..... ***Pachnephorus*** (p. 401).  
 - Pronotum broadest at base, somewhat bell-shaped. Elytra covered by scale-like setae, arranged in longitudinal rows ..... ***Mecistes*** (p. 400).
13. Upper side very densely covered by scales, masking the ground of elytra and pronotum. First antennomere on dorsal side with a field of dense whitish scales ...  
 ..... ***Pachnephopterus*** (p. 401).  
 - First antennomere without a field of scales ..... **14**.
14. Body length over 5.0 mm ..... ***Eryxia*** (p. 386).  
 - Body length under 3.5 mm. Elytral epipleura absent, Upper side and underside densely pubescent ..... ***Caspiana*** (p. 382).
15. Pronotum transverse, feebly convex, almost as broad as elytra ..... **16**.  
 - Pronotum cylindrical or subcylindrical, transversely convex, distinctly narrower than elytra at base ..... **20**.
16. Body parallel-sided. Elytra covered by pale, adpressed scale-like hairs ..... **17**.  
 - Body oval ..... **18**.
17. Epipleura extremely narrow, apparently absent ..... ***Parnops*** (p. 405).  
 - Epipleura very narrow, but in anterior 2/3 distinct (= *Allecumolpus* MEDVEDEV, 1957). Perhaps congeneric with *Parnops* ..... ***Dermestops*** (p. 385).
18. Hind-wings and humeral callus present. Anterior margin of elytra without marginal ridge ..... ***Colaspina*** (p. 383).  
 - Hind wings and humeral callus absent. Anterior margin of elytra with marginal ridge ..... ***Colaspidea*** (p. 382).
19. Lateral sides of pronotum entirely margined, elytra without any trace of humeral calli, body oblong, covered by white scales also on legs, tibiae without emargination before apex, claws incised ..... ***Damasus*** (p. 384).  
 - Other combinations of characters ..... **20**.
20. Head with a deep groove at inner side of eye. Lateral sides of pronotum unmargined. Emarginations on mid and hind legs distinct, but shallow. Length of body 3.2–4.2 mm ..... ***Scelodonta*** (p. 406).  
 - Head without grooves at inner side of eye ..... **21**.
21. Mid and/or hind tibiae emarginate near apex ..... **22**.  
 - Mid and/or hind tibiae simple, without emargination ..... **26**.
22. Lateral sides of pronotum with distinct, entire or shortened marginal ridge ... **23**.  
 - Lateral sides of pronotum without marginal ridge or the ridge is perceptible at anterior angles only ..... **24**.

23. Elytra with regular, partly interrupted rows of punctures, intervals with irregular rows of short, fine hairs. Length of body under 5.0 mm ..... *Atomyria* (p. 381).  
 - Upper side covered by long erect hairs and sometimes also by scales. Body usually longer than 5.0 mm ..... *Trichochrysea* (p. 406).
24. Elytra with adressed scales only ..... *Demotina* (part) (p. 384).  
 - Elytra covered by hairs or hairs and scales ..... 25.
25. Elytra with some erect hairs in addition to adressed scales .... *Hyperaxis* (p. 386).  
 - Elytra covered by hairs (short, adressed and very long, erect) only. Adressed hairs arranged in four longitudinal stripes separated by three bare intervals. Upper side with metallic golden-bronzy or golden-green shine, length 4.5–7.0 mm ...  
 ..... *Andosia* (p. 379).
26. Prosternum transverse or at least not much longer than broad ..... 27.  
 - Prosternum narrow, usually much more than 2 × as long as broad at middle ... 32.
27. Elytra bare. Body uniformly pitchy black, legs and antennae dark reddish brown. Length 4.0–6.0 mm ..... *Anidania* (p. 379).  
 - Elytra covered by hairs or scales ..... 28.
28. Elytra with with erect or semiadressed hairs. Femora without spine ..... 29.  
 - Elytra with adressed scales. Femora usually with a tooth or spine on underside ...  
 ..... *Demotina* (part) (p. 384).
29. Lateral ridge of pronotum with two teeth. Upper side with green metallic gloss. European species. Length of body 4.5–6.0 mm ..... *Pales* (p. 405).  
 - Not as above ..... 30.
30. Anterior margin of proepisternum straight or concave ..... 31.  
 - Anterior margin of proepisternum slightly convex. Marginal ridge of pronotum thin and weak ..... *Bromius* (p. 381).
31. Body longer than 4.0 mm. Marginal ridge of pronotum thick ..... *Aoria* (p. 379).  
 - Body length under 3.0 mm ..... *Xanthonia* (p. 408).
32. Femora with a distinct tooth beneath ..... 33.  
 - Femora without a distinct tooth beneath ..... *Malegia* (p. 399).
33. Fore femora thicker than hind femora ..... *Trichotheca* (p. 407).  
 - Fore femora not thicker than hind femora ..... *Lypesthes* (p. 386).

#### Genus *Acrothinium* MARSHALL, 1864

The genus comprises three E Asiatic species, in discussed area one species. Upper side with strong metallic shine. Head and pronotum green, cupreous or greenish bronzy, elytra dark red or purplish, with green or blue stripes along suture and lateral sides; in the middle of each elytron often a golden or golden-greenish spot. Legs dark greenish-blue, antennae black with brownish four or five antennomeres. Elytra covered by erect, relatively long hairs. General view as in plate L, **phot. 447**. Length 4.6–7.6 mm. Distributed in basin of Ussuri, China and Japan (Hokkaido, Honshu, Shikoku, Kyushu). Two subspecies, *matsuii* NAKANE, 1956 and *shirakii* NAKANE, 1956, were described from Is. Ryukyu (out of discussed area) .... *gaschkevitschii* (MOTSCHOULSKY, 1860).

Genus *Adoxinia* MARSHALL, 1864

One species only. Bronzy-black. Labrum, antennae, legs and anterior margin of pronotum reddish-brown. On elytra short, erect hairs, arranged in more or less regular rows. General view as in plate L, **phot. 448**. Length 4.0–6.0 mm (= *jacobsoni* REITTER, 1894). Distributed in Turkmenia, Usbekistan, SE Kazakhstan and Tadzhikistan ..... *spinipes* REITTER, 1888.

Genus *Andosia* WEISE, 1896

One species only. Upper side bronzy-green or bronzy-golden. Antennae, tibiae and tarsi rusty-red. Elytra covered by adpressed and long erect hairs, the adpressed hairs arranged in four longitudinal stripes. General view as in plate L, **phot. 449**. Length 4.5–7.0 mm. Distributed in S Kazakhstan, E Usbekistan and Tadzhikistan ..... *reitteri* WEISE, 1896.

Genus *Anidania* REITTER, 1889

One species only. Body black piceous. Mandibulae, labrum, clypeus, antennae, legs and a narrow stripe along anterior margin of pronotum reddish-brown. Upper side bare, feebly shining, almost matt. Four apical antennomeres slightly thickened. General view as in plate LI, **phot. 451**. Length 5.0–7.0 mm (= *rubripes* REITTER, 1888. Distributed in Turkmenia, Usbekistan, SE Kazakhstan and Tadzhikistan ... *luctuosa* (SOLSKY, 1882).

Genus *Aoria* BALY, 1863

To the genus *Aoria* belong 14 species distributed mainly in the Oriental region. In discussed area four species.

Key to subgenera

1. Lateral side of pronotum with a marginal ridge on whole length ..... *Osnaparis* (p. 379).
- . Marginal ridge on lateral sides of pronotum shortened ..... *Aoria* s. str. (p. 380).

Subgenus *Osnaparis* FAIRMAIRE, 1889.

One species only. Body, basal parts of femora and antennae chestnut. Remaining parts of legs and antennae alike labrum black. Head closely and coarsely punctured. Punctures on pronotum very coarse and dense, punctures on elytra very strong, arranged in rows. Intervals slightly convex, distinctly and moderately strongly punctate. In female behind humeral callus runs a short, raised ridge. Length 5.5–6.7 mm (= *taliana* PIC, 1935). Distributed in China from Sichuan to Shantung ..... *nucea* (FAIRMAIRE, 1889).

Subgenus *Aoria* s. str.

Key to species

1. Prothorax blue, elytra greenish, with metallic shine. Pubescence of upper side gray, erect. Length about 6.0 mm. Described from China (Kansu), based on one male only ..... ***cyanea*** CHEN, 1940.
- . Upper side without metallic shine, reddish brown, or partly black ..... **2.**
2. Head and pronotum coloured similarly to elytron, reddish brown with feeble cupreous sheen. Length about 4.0 mm. Described from NE China (Shantung) .....  
..... ***gracilicornis*** CHEN, 1940.
- . Head and pronotum black, elytron reddish brown or brown. General view as in plate LI, **phot. 452**. Distributed in N Vietnam and China from Kwantung to S Kansu ..... ***scutellaris*** PIC, 1923.

Genus *Aphilenia* WEISE, 1888

The genus *Aphilenia* contains 5 species, distributed in Transcaspia and NW China (Sinkiang).

Key to subgenera

1. Marginal ridge on lateral side of pronotum hardly perceptible or absent. Primary and secondary punctures on elytra of similar size, rows of punctures therefore barely perceptible ..... ***Pseudaphilenia*** (p. 381).
- . Marginal ridge on lateral side of pronotum well-developed, sometimes interrupted in the middle. Primary punctures on elytra stronger than the secondary, rows of punctures distinct ..... ***Aphilenia*** s. str. (p. 380).

Subgenus *Aphilenia* s. str.

Key to species

1. Elytra strongly punctate, punctures arranged in impressed rows. All intervals convex, intervals 2, 4 and 6 usually raised. Body rusty-brownish, on elytra rather indistinct darker pattern. General view as in plate LI, **phot. 455**. Length 6.5–7.5 mm. Distributed in Kazakhstan and Turkmenia ..... ***ornata*** REITTER, 1888.
- . Elytra moderately strongly punctate, intervals not convex ..... **2.**
2. Body length under 4.2 mm. Body pale testaceous, on pronotum and elytra blackish pattern, often partly reduced. Distributed in Turkmenia and S Uzbekistan ..... ***parvula*** WEISE, 1894.
- . Body length over 4.6 mm ..... **3.**
3. Hairs on elytra very short, distinctly perceptible in apical part only. Upper side without dark pattern. Length 4.7 mm. Described from NW China (Kashgar) based on a single specimen only ..... ***inornata*** CHEN, 1935.

- Hairs on elytra long, well-visible on whole surface. Colouration of body similar as in *hauseri* (subg. *Pseudoaphilenia*). Length 4.6–6.5 mm. Distributed in Turkmenia, Usbekistan and Tadzhhikistan ..... ***interrupta*** WEISE, 1888.

Subgenus ***Pseudaphilenia*** LOPATIN, 1977

One species only. Body pale rusty-yellow, on each elytron two little spots in basal part and a narrow longitudinal stripe in the middle black, suture usually also black. General view as in plate LI, **phot. 454**. Length 5.0–6.8 mm. Distributed in Kazakhstan and Turkmenia ..... ***hauseri*** WEISE, 1894.

Genus ***Atomyria*** JACOBSON, 1894

Two species only.

Key to species

1. Puncturation of elytra distinct, interstices in hind half smooth and shining. Dark rusty-yellow with darker suture and usually with a transverse blackish spot on each elytron. Elytral spots sometime fused into a transverse stripe or, in darker specimens, expanded on almost whole elytra except humeri and apex. Frons strongly and densely punctured. Pronotum broadened and laterally angulate. Claws with a large tooth-like appendix. General view as in plate LI, **phot. 456**. Length 3.0–5.0 mm. Distributed in Kazakhstan, Usbekistan and Tadzhhikistan ..... ***sarafschanica*** (SOLSKY, 1882).
- Puncturation of elytra more fine, interstices in hind part feebly shining or almost mat. Remaining characters as in *sarafschanica*. Perhaps conspecific with *sarafschanica*. Described from Transcaucasia ..... ***persica*** (BALY, 1877).

Genus ***Bromius*** Chevrolat, 1837

One species only. General view as in plate LI, **phot. 453**. Body black or partly brown, legs black or with brownish tibiae, three or four basal antennomeres reddish. Length 5.0–6.0 mm. Variations: elytra black, covered by whitish hairs (typical form), elytra black, hairs yellowish, tibiae basally reddish-brown (ab. *weisei* HEYDEN, 1883), elytra and tibiae brown, hairs whitish (ab. *epilobii* WEISE, 1882), elytra brown, hairs yellowish (ab. *villosulus* SCHRANK, 1781). Variation *villosulus* occurs mainly in southern part of distribution area and in opinion of some authors forms a distinct subspecies. Lives on cultivated *Vitis vinifera* L. and on *Onagraceae*. Distributed in almost whole Europe and palaeartic part of Asia, introduced also to North America. In M and N Europe and also in mountains of S Europe mainly parthenogenetic polyploidal populations ..... ***obscurus*** (LINNAEUS, 1758).

Genus *Callipta* LEFÈVRE, 1885

The genus *Callipta* comprises four species.

Key to species

1. Upper side black with bronzy metallic reflex. Asiatic species ..... 2
- . Upper side aeneous, shining, elytra covered by sparse hairs, densely and finely punctate, femora unarmed. N African species. Length 3.0–3.5 mm. Described from Tunisia ..... *oberthuri* (FAIRMAIRE, 1876).
2. Body slender, sides of elytra in both sexes very feebly rounded, elytra 2 × longer than pronotum. Hairs on elytra longer, thin and more densely scattered, longitudinal rows of hairs indistinct. Length 2.7–4.0 mm. Described from Uzbekistan ...  
..... *borealis* LOPATIN, 1976.
- . Body broader, sides of elytra in both sexes distinctly (in female strongly) rounded, elytra 1.6–1.8 × longer than pronotum. Hairs on elytra shorter, semierect, arranged in single, longitudinal rows ..... 3.
3. Pronotum broader than long, its surface densely and deeply punctate. Apex of aedeagus rounded, without lamella or teeth. Length of male 3.2–3.6 mm (male) to 4.0–4.5 mm (female). Described from N Iran ..... *iranica* LOPATIN, 1997.
- . Pronotum not broader than long, its surface less densely punctate. Antennae, labrum and legs reddish yellow, in darker coloured specimens brown or brownish. All femora with a small, but distinct and sharp tooth. General view as in plate II, **phot. 458**. Length 2.7–4.1 mm (male) to 3.8–4.7 mm (female) (= *smirnovi* MEDVEDEV, 1957, *turcomana* MEDVEDEV, 1957). A few local forms differing by aedeagus shape and by regional distribution are described as distinct subspecies: from S Turkmenistan (subsp. *badghyza* LOPATIN, 1997 and *murgabica* LOPATIN, 1997), W Turkmenistan (subsp. *balchana* LOPATIN, 1997), SW Turkmenistan (subsp. *turcomana* MEDVEDEV, 1957) and N Turkmenistan (subsp. *palvanica* LOPATIN, 1997). Distributed in Turkmenistan and in Caucasian countries ..... *fausti* (WEISE, 1882).

Genus *Caspiana* LOPATIN, 1978

One species only. Body black piceous. Mandibulae, labrum, clypeus, antennae, legs, a narrow stripe along anterior margin of pronotum, humeri and apex of elytra reddish-brown. Upper side and underside uniformly and densely covered by hairs. Length 3.4 mm. Described from Turkmenia based on a single specimen (male) only ...  
..... *armata* LOPATIN, 1978.

Genus *Colaspidea* LAPORTE, 1833

The genus *Colaspidea* includes 12 species; of these six occur in the western part of the Mediterranean area, remaining six species, perhaps not congeneric, in America.



Key to species

- Body larger, about 3.5–4.0 mm long. General view as in plate LI, **phot. 459**. Upper side (sometimes elytra only) with green metallic sheen (= *abbreviata* DESBROCHERS, 1871, *globata* REDTENBACHER, 1874, *metallica* LEFÈVRE, 1876). Distributed in southern Spain and in MOROCCO ..... ***grossa*** FAIRMAIRE, 1866.
- Body smaller, not exceeding 3.0 mm. Upper side with dark copper or dark bronzy sheen ..... **2.**
2. Humeral callus small but strongly convex, distinctly separated by a oblique impression. Upper side black with copper-bronzy metallic sheen, rather sparsely covered by semi-erect, thin and short setae. Legs and antennae reddish brown. Pronotum relatively great, finely punctured, intersices reticulate. Punctures of elytra much stronger than in pronotum, interstices smooth and shining. Length 1.6–2.4 mm (= *nitida* REDTENBACHER, 1858, *proxima* FAIRMAIRE, 1861). Distributed in southern France, northern part of Spain, Italy and Greece ..... ***oblonga*** BLANCHARD, 1855.
- Humeral callus absent or almost absent, anterior part of elytra without impressions ..... **3.**
3. North-African species ..... **4.**
- Species from Europa and Mediterranean Islands ..... **5.**
4. Anterior part of pronotum rather strongly narrowed anteriorly, surface of pronotum moderately strongly punctate. Length 2.2–2.8 mm. Distributed in Algeria and Tunisia ..... ***ovulum*** FAIRMAIRE, 1866.
- Anterior part of pronotum very feeble narrowed anteriorly, surface of pronotum finely punctate. Length about 2.0 mm. Described from Algeria ..... ***inflata*** LEFÈVRE, 1876.
5. Body very broad, subhemispherical, punctures on pronotum not much finer than on elytra. Upper side finely and shallowly, but distinctly reticulate. Length 2.2–3.0 mm (= *?globata* REDTENBACHER, 1858, *?sphaeroides* FAIRMAIRE, 1861). Distributed in southern France and in Iberian Peninsula. Reports from Algeria rather doubtful ..... ***globosa*** (KÜSTER, 1848).
- Body oblong, punctures on pronotum much (2–3 ×) finer than on elytra. Surface of elytra shining, not reticulate. Length 2.0–2.5 mm (= *aeruginea* FABRICIUS, 1792). Distributed in Italia and Sicily ..... ***metallica*** (ROSSI, 1790).

Genus *Colaspina* WEISE, 1893

One species only. General view as in plate LII, **phot. 460**. Body broad, pronotum strongly narrowed anteriorly. Humeral callus distinct, hind wings normal developed. Upper side evenly and uniformly punctured, covered by white, rather long, thick, adpressed setae. Ground with strong greenish, bronzy or reddish-golden metallic gloss. Legs and antennae light orange. Length 2.9–3.8 mm. Distributed in southern France and Iberian Peninsula ..... ***saportae*** (GRENIER, 1863).

Genus *Colaspinella* WEISE, 1893

One species only. General view as in plate LII, **phot. 461**. Oblong oval, convex, black, upper side shining, with distinct bronzy, green, blue black or cupreous metallic reflex, often different on pronotum and on elytra; more rarely upper side almost pure black. Elytra randomly punctured, punctures of upper side usually strong, in variations rather moderately strong. Antennae and legs brown. Length 4.1–4.6 mm. Distributed in Asia Minor ..... **grandis** (FRIVALDSZKY, 1880).

Genus *Damasus* CHAPUIS, 1874

One species only. Body elongate, pitchy black, legs and antennomeres 8–11 dark brown, antennomeres 2–7 reddish brown. Upper side and legs covered by large, long scales. Sides of pronotum with entire marginal ridge. Hind wings and humeral calli absent. General view as in plate LII, **phot. 462**. Length 5.8–7.0 mm. Distributed in Syria and Asia Minor ..... **albicans** CHAPUIS, 1874.

Genus *Demotina* BALY, 1863

The genus *Demotina* comprises about 30 species distributed in SE Asia and Indonesia. In discussed area occur 11 species, mainly in Japan.

Key to species

1. Legs partly blackish or dark brown ..... 2.
- . Legs entirely pale, usually rusty-yellow or pale brownish-red ..... 4.
2. Each elytron with with a longitudinal ridge or with several pairs of tubercles behind middle and sometimes also with similar convexities latero-apically ..... 3.
- . Elytra without such a ridge. Upper side brown to pitchy. On each elytron on subbasal area an oblique whitish marking consisting of scales. General view as in plate LII, **phot. 463**. Length 3.3–4.2 mm. Distributed in S China and in Japan (Honshu, Kyushu) ..... **fasciculata** BALY, 1864.
3. Smaller. Elytron with a ridge behind middle, femora without blackish marking at base. Body dark reddish brown to pitchy, upper side with ill-defined blackish markings. Length 3.8 mm. Distributed in Indochina, S China and Japan (Honshu, Shikoku, Kyushu) ..... **tuberosa** CHEN, 1935.
- . Larger. Elytron with a few pairs of tubercles behind middle; one pair distinct, the remaining feebly developed, femora blackish at base. Body reddish brown, lateral parts of pronotum blackish, elytron with irregular blackich pattern. Length 4.2–4.5 mm. Described from Kyushu ..... **imasakai** ISONO, 1990.
4. In female abdomen with lateral margins of three apical sternites serrate ..... 5.
- . In female abdomen with lateral margins of three apical sternites not serrate ..... 6.
5. Clypeus about 2.5 × broader than long. Body dark yellowish to reddish brown. Upper side sometimes moderately darkened. Length 2.5–3.2 mm. Distributed

- In Japan (Kyushu, Ryukyu Is.); reported also, perhaps erroneously, from Nepal ...  
 ..... *serriventris* ISONO, 1990.
- Clypeus about 1.7 × broader than long. Upper side brown, antennae and legs yellowish. A small spot on the middle of each elytron whitish. Length 3.2 mm. Distributed in Japan (Honshu, Shikoku, Kyushu) ..... *bipunctata* JACOBY, 1885.
6. A very large patch on pronotum black. Body rusty-reddish, each elytron with several black spots in anterior part and near apex. Antennae pale, fulvous. Length 3.0 mm. Described from China (Kansu) based on one specimen .....  
 ..... *gansuica* CHEN, 1940.
- Pronotum pale or somewhat darkened, but without a distinct black patch ..... 7.
7. Antennae rather robust, antennomere 2 longer than 3. Body coloured similarly as in *fasciculata* (antithesis 2), but distinctly smaller and legs are entirely pale. Length 2.2–3.0 mm. Distributed in Japan (Honshu, Shikoku, Kyushu, Ryukyu Is.) ...  
 ..... *decorata* BALY, 1874.
- Antennae rather slender, antennomere 2 distinctly shorter than 3 ..... 8.
8. Tarsomere 3 of fore and mid legs larger than the posterior one. Clypeus strongly sloping downward just before antennal socket. Body yellowish brown; hind part of head, pronotum and scutellum somewhat darker. Antennae and tarsi pale. Length about 3.0 mm. General view as in plate LII, **phot. 464**. Distributed in Japan (Honshu, Kyushu, Ryukyu Is.) and Taiwan ..... *elegans* CHŪJŌ et SHIROZU, 1955.
- Tarsomere 3 of all legs similar in size. Clypeus flat, not strongly sloping downward just before antennal socket ..... 9.
9. Elytra very densely covered by scales. Clypeus strongly broadened anteriorly. Elytral epipleuron with fine scales arranged in two regular rows. Body generally yellowish brown. General view as in plate LII, **phot. 465**. Length 2.9–4.2 mm. Distributed in Japan (Honshu, Shikoku, Kyushu) ..... *squamosa* ISONO, 1990.
- Elytra moderately densely covered by scales. Clypeus not strongly broadened anteriorly. Elytral epipleuron with fine scales arranged in one regular row ..... 10.
10. Scutellum subtrapezoidal, distinctly broadened basally. Apical angle of elytra less than 90°. Generally yellowish brown, in some specimens pronotum, elytra and underside partly darkened. Length 2.8–3.3 mm. Distributed in Japan (Honshu) ...  
 ..... *vernalis* ISONO, 1990.
- Scutellum linguiform, not broadened basally. Apical angle of elytra right (90°). Colouration of body generally similar as in *squamosa* (thesis 9), but rather darker and often with ill-defined blackish marking on elytra. Length 3.0–4.0 mm. Distributed in Japan (Honshu, Shikoku, Kyushu) and Korea .....  
 ..... *modesta* BALY, 1874.

Genus *Dermestops* JACOBSON, 1898

*Allecumolpus* MEDVEDEV, 1957

One species only. Body brown, palpi, antennae and legs testaceous, mandibulae black, upperside densely covered by scale-like setulae. Pronotum 2 × broader than long, its lateral sides rounded, broadest in the midlength. Elytra randomly punctate, on each elytron four weak longitudinal costae. General view as in plate LII, **phot. 466**. Length 8.0–9.0 mm (= *smirnovi* MEDVEDEV, 1957). Described from Turkmenia .....  
 ..... *ahngeri* JACOBSON, 1898.

Genus *Eryxia* BALY, 1865

Aethiopian genus, in discussed area one species only. Body reddish-testaceous with undefined light brownish spots on elytra. Pronotum subspherical, elytra with parallel sides. Upper side densely covered with long grey-reddish hairs, consequently elytral punctures not visible. Length 4.0–5.0 mm. Described from Morocco .....  
..... *annobioides* ESCALERA, 1914.

Genus *Hyperaxis* GEMMINGER et HAROLD, 1874

About 20 species, distributed in India, Indochina and Indonesia, belong to the genus *Hyperaxis*; in discussed area one species only. Body piceous, antennae dark yellowish with darkened apical part, legs piceous. Upper side covered by adpressed scale-like hairs. Elytron with a oblique stripe of black scales behind middle. Length 4.2 mm (= *taiwana* CHŪJŌ, 1956). Distributed in S China, Taiwan and Japan (Honshu, Shikoku, Kyushu) ..... *fasciata* (BALY, 1874).

Genus *Iranomolpus* LOPATIN, 1979

*Andosiomorpha* LOPATIN, 1981, *Bezdekia* WARCHAŁOWSKI, 2005.

Key to species

1. Upper side with metallic reflex, cupreous-bronzy, covered by thin, adpressed, silvery hairs forming four broad, longitudinal stripes. Labrum, 4–5 basal antennomeres and legs rusty-brown. Body relatively stout, pronotum broad with rounded sides. General view as in plate L, **phot. 450**. Male unknown. Length 5.0 mm .....  
..... *argentatus* LOPATIN, 1981.
- . Upper side without metallic reflex, chestnut to pitchy brown ..... 2.
2. Apex of aedeagus transversely cut. Colouring of body uniform, dark brown to blackish. Humeral calli distinct, moderately protruding. Fore legs in both sexes slightly elongate. Antennae slender, in male 0.5 ×, in female about 0.45 × as long as body. General view as in plate LII, **phot. 467**. Body length 6.0–8.0 mm ...  
..... *tenebrosus* (WARCHAŁOWSKI, 2005).
- . External characters as in *tenebrosus*. Aedeagus sharpened. Length 6.6–7.5 mm ...  
..... *badius* LOPATIN, 1979.

Genus *Lypesthes* BALY, 1863

The genus *Lypesthes* includes 15 exclusively E Asiatic species. In the discussed area six species.

Key to species

1. Elytra covered by hairs and sometimes by white powdery excrecence ..... 2.
- . Elytra covered by adpressed scale-like setae and by erect setae ..... 3.

2. Elytra covered by very thin white hairs and white powdery excrescence. Body black, legs sometimes paler, brown or even testaceous. General view as in plate LII, **phot. 468**. Length 6.0–7.0 mm (= *pulverulentus* JACOBY, 1885, *farinosus* FAIRMAIRE, 1889, *testaceipes* PIC, 1928, *fulvipes* CHŪJŌ, 1954, *tibialis* OHNO, 1958). Distributed in basin of Ussuri, N China, Korea and Japan ..... **ater** (MOTSCHULSKY, 1860).
- Elytra covered by relatively thick hairs, without white excrescence. Body reddish brown to dark General view as in plate LIII, **phot. 469**. Length 6.5–7.5 mm (*anger* CHŪJŌ, 1935, *taiwanus* CHŪJŌ, 1956) ..... **fulvus** (BALY, 1878).
3. Apex of elytron not emarginate ..... **4**.
- Apex of elytron deeply emarginate ..... **5**.
4. Scutellum covered by adpressed scales in anterior part only. Clypeus dark reddish. Body dark reddish brown to pitchy. Length 4.5–6.0 mm. Distributed in Japan (Kyushu, Ryukyu Is.) ..... **itoi** CHŪJŌ, 1954.
- Scutellum covered by adpressed scales on whole surface. Clypeus pitchy brown. Body entirely pitchy black. Length 5.5–6.0 mm. General view as in plate LIII, **phot. 470**. Distributed in Japan (Honshu, Kyushu, Tsushima) ..... **japonicus** OHNO, 1958.
5. Sutural angle of elytron strongly and straightly produced posteriad, its top sharp. Antennomere 3 distinctly shorter than 4. Body entirely reddish brown to pitchy brown. Length 7.0–8.0 mm. Distributed in China and Japan (Honshu, Kyushu, Shikoku) ..... **lewisii** (Baly, 1878).
- Sutural angle of elytron strongly produced posteriad, but its top is rather blunt and slightly bent. Antennomere 3 as long as 4. Body entirely reddish brown to pitchy black. Length 6.0–7.0 mm. Distributed in Japan (Honshu) ..... **kiensis** OHNO, 1958.

Genus *Macrocoma* CHAPUIS, 1874

Literature: WARCHAŁOWSKI 2001.

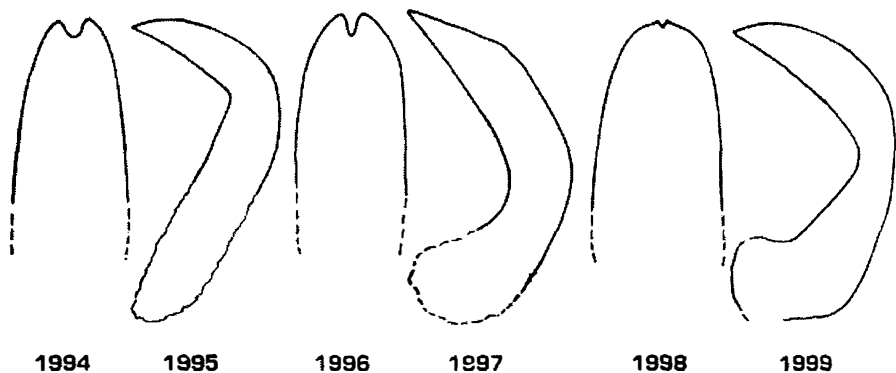
*Pseudocolaspis* THOMSON, 1858 nec LAPORTE, 1833, *Eubraxis* Baly, 1878, *Ischyromus* Jacobson 1893.

The genus comprises over 80 species described from Eurasia and Africa. In discussed area 46 species, distributed mainly in Mediterranean area.

Key to species

1. Species from Canary Islands ..... **2**.
- Species from other parts of Palaearctic area ..... **9**.
2. Elytra oval, rounded laterally, humeral calli feebly developed ..... **3**.
- Elytra with well-developed humeral calli ..... **4**.
3. Length of body 2.8–3.2 mm. Antennae and legs reddish brown. Upper side shining, dark, with metallic reflex. Aedeagus as in figs 1994, 1995 Described from Lanzarote ..... **divisa** (WOLLASTON, 1864).
- Length of body 3.8–4.4 mm. Body brown, differently darkened. Aedeagus as in figs 1996, 1997. Described from Alegranza ..... **oromiana** DACCORDI, 1978.

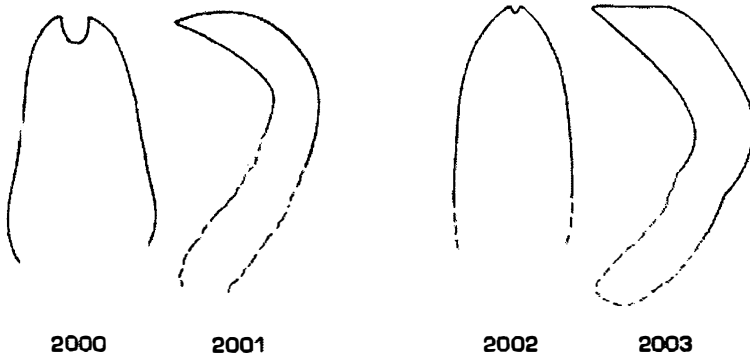
4. General view as in plate LIII, **phot. 471**. Antennae and legs blackish with metallic reflex. Upper side dark brassy. Apex of aedeagus (figs **1998, 1999**) with a small, sharp incision. Length 3.0–4.2 mm. Described from Gran Canaria ..... **obscuripes** (WOLLASTON, 1864).  
 —. Legs not entirely blackish ..... 5.



Figs 1994–1999 (after WARCHAŁOWSKI 2001): 1994, 1995 – *Macrocoma divisa*; 1996, 1997 – *M. oromiana*; 1998, 1999 – *M. obscuripes*.

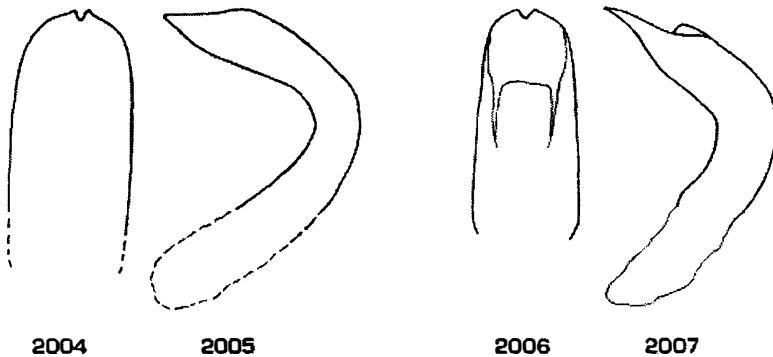
5. Length under 3.1 mm. Head and pronotum dark brown or blackish, anterior border of pronotum reddish. Elytra, legs and antennae reddish-brown. Hind femora usually darker. Upper side shining, finely and rather densely punctate. Surface of pronotum smooth. Humeral calli present but not protruding. Described from Fuerteventura ..... **dubia** (WOLLASTON, 1864).  
 —. Length over 3.3 mm ..... 6.
6. Dark coloured, upper side with cupreus reflex. Legs dark reddish brown, femora apically and tarsi often blackened. Head and eyes larger, distinctly broader than anterior margin of pronotum. General view as in plate LIII, **phot. 472**. Legs robust and humeral calli stronger protruding than in following species. Aedeagus as in figs **2000, 2001**. Length 3.3–4.0 mm. Described from Tenerife ..... **latifrons** LINDBERG, 1952.  
 —. Coloration of body more pale with cupreous or bronzy reflex, head and eyes smaller ..... 7.
7. Upper side feebly shining, finely and densely punctate. Basis of antennae brown, their apical part black. Legs reddish brown, femora apically more or less darkened. Hairs covering elytra relatively short. Aedeagus as in figs **2002, 2003**. Length 3.5–4.2 mm. Described from Gran Canaria, originally reported also from Hierro, La Palma and Tenerife ..... **splendidula** (WOLLASTON, 1864).  
 —. Upper side shining, moderately densely punctate. Antennae unicolorous or in apical part more or less darkened. Legs unicolourous, reddish brown, femora sometimes slightly darkened apically ..... 8.

8. Body outline more slender. Pronotum more strongly, elytra considerably more strongly punctured. Elytra shiny, hairs on their surface longer. Aedeagus as in figs **2004, 2005**. Length 3.3–4.0 mm. Described from Tenerife ..... *splendens* s. str. LINDBERG, 1951.
- Body outline more stout. Pronotum more finely, elytra considerably more finely punctate. Elytra feebly shining, hairs on their surface shorter. Aedeagus as in figs **2006, 2007**. Length 3.2–4.0 mm (= *occidentalis* PALM, 1976, nec ESCALERA, 1914). Forms two subspecies: elytra stronger shining, legs usually slightly darkened (nominotypical subspecies), elytra feebly shining, legs pale reddish (subsp. *franzi* PALM, 1976 = *officiens* WARCHAŁOWSKI, 2001). Nominotypical subspecies is described from Hierro, subsp. *franzi* from La Palma ..... *palmaensis* PALM, 1977.



Figs 2000-2003 (after WARCHAŁOWSKI 2001): 2000, 2001 – *Macrocoma latifrons*; 2002, 2003 – *M. splendida*.

9. Iberian and N African species ..... **10.**
- Species from E Mediterranean area and Asia ..... **27.**



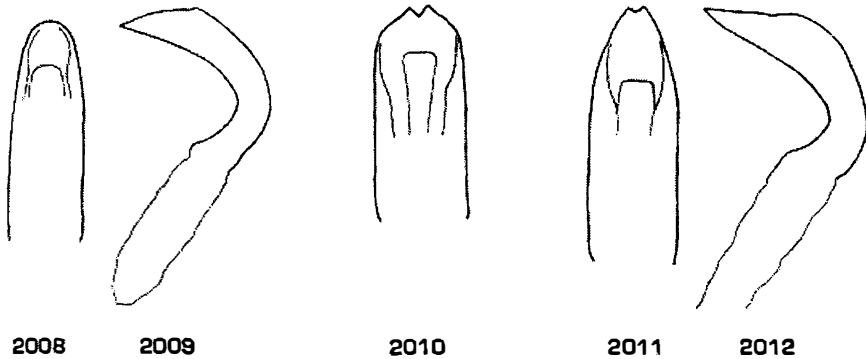
Figs 2004-2007 (after WARCHAŁOWSKI 2001): 2004, 2005 – *Macrocoma splendens*; 2006, 2007 – *M. palmaensis*.

10. Species from Iberian Peninsula. General view as in plate LIII, **phot. 4730**. Upper side black with distinct cupreous sheen. Legs black, tibiae usually reddish-brown. Aedeagus as in figs **2008, 2009, 1263**. Length 4.8–5.5 mm. Distributed in southern Spain ..... *cylindrica* KÜSTER, 1846.
- . Species from Morocco, Algeria and Tunisia ..... **11**.
11. Mid and hind tibiae in both sexes just behind knees conspicuously, thickened. General view as in plate LIII, **phot. 474**. Upper side black with bronzy reflex, legs and antennae reddish brown, femora, thickenings of tibiae and last 3–4 antennomeres usually darkened. Pronotum covered by randomly scattered, long, white, adpressed hairs. Scale-like hairs of elytra arranged in longitudinal rows. Aedeagus as in fig. **2010**. Length 2.8–3.2 mm. Distributed in Algeria and Morocco ..... *crassipes* (LEFEVRE, 1876).
- . Tibiae, particularly in male, often thickened, but the thickening is gradual. Length (except *aeneonigra*, thesis 25 and *seriesericans*, thesis 24) over 3.5 mm ..... **12**.
12. Apex of aedeagus in dorsal view distinctly incised or emarginate ..... **13**.
- . Apex of aedeagus in dorsal view neither emarginate nor distinctly incised, sometimes impressed or indistinctly incised on ventral side only ..... **21**.
13. On elytra setae arranged in longitudinal series. General view as in plate LIII, **phot. 475**. Body black. Upper side with distinct greenish (on pronotum slightly aeneous) metallic reflex, strongly and densely punctate. Pronotum widest behind its midlength, subglobulous, with broadly rounded lateral sides. Elytra widest at basis, very feebly narrowed posteriad, their apex regularly rounded. Antennomeres 1–5 or 1–6 reddish brown, the remaining antennomeres black. Legs black, tibiae and tarsi barely lightened, dark brown to pitchy. Aedeagus as in figs **2011, 2012**. Length 4.0–4.3 mm. Described from N Algeria ..... *djurdjurensis* WARCHAŁOWSKI, 2001.
- . Punctures and hairs (or setae) confuse or partly subseriate (*henoni*-group) ..... **14**.
14. Elytra reddish with a great blackish spot near scutellum. Length about 4.8 mm. Described from Morocco. Male unknown. Perhaps identical with *henoni occidentalis* ab. *pardoi* (antithesis 16) ..... *bipartita* KOCHER, 1962.
- . Elytra uniformly coloured, or dark rust-reddish, in anterior part somewhat darkened ..... **15**.
15. Apex of aedeagus deeply emarginate. Body 5.5–8.5 mm long, rarely shorter (about 5.0 mm) ..... **16**.
- . Apex of aedeagus deeply and narrowly incised or shallowly and broadly emarginate ..... **17**.
16. General view as in plate LIII, **phot. 476**. On elytra hairs entirely confused, upper side black, sexual dimorphism involves built of legs only. Legs always black or black with feeble metallic reflex. Length 6.0–7.0 mm. Variations: hairs on pronotum very short (ab. *reymondi* KOCHER, 1958), upper side black, elytra sometimes with cupreous metallic reflex, on pronotum median longitudinal line very distinct, shining, a little convex (ab. *sarroensis* KOCHER, 1958). Aedeagus as in figs **2013, 2014**. Distributed mainly in northern Morocco and in Algeria ..... *henoni* (PIC, 1894) s. str.
- . On elytra hairs often partly arranged in longitudinal series, asexual dimorphism usually involves also colouring of upper side (= *pici* ESCALERA, 1914). Variations: upper side black, without metallic reflex (ab. *nigrita* KOCHER, 1958), upper side



olivegreen with bronzy or greenish metallic sheen (ab. *atlasica* KOCHER, 1958 = ?*mogadorensis* Pic, 1912), upper side cupreous, darker in female (ab. *susica* KOCHER, 1967), upper side with bluish metallic sheen (ab. *coerulescens* KOCHER, 1958), upper side in male black, in female legs, antennae and elytra reddish-brown (ab. *pardoii* KOCHER, 1967), body rather large (6.5–7.0 mm), upper side covered by light rust-yellow hairs (ab. *lindbergi* KOCHER, 1967). Here probably also *debduensis* KOCHER, 1967, black, rather stout, almost hairless on pronotum and very sparsely haired on elytra. Distributed mainly in southern part of Morocco ..... *henoni occidentalis* (ESCALERA, 1914).

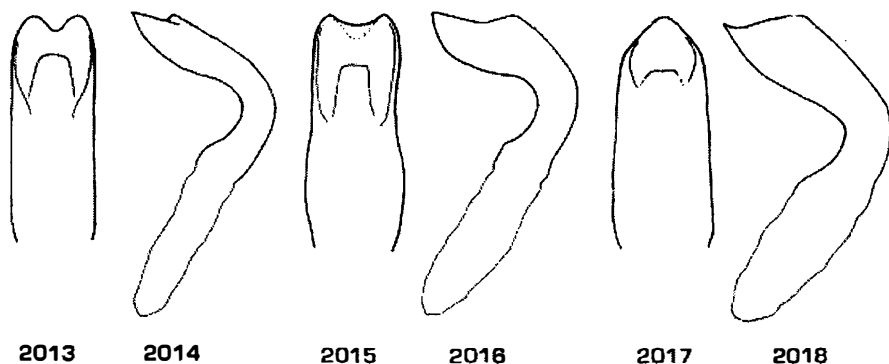
17. Apex of aedeagus deeply and narrowly incised ..... **18.**  
 -. Apex of aedeagus shallowly and broadly emarginate. Upper side black or black with rather feeble cupreous metallic sheen. Length 4.2–5.5 mm ..... **19.**



Figs 2008–2012 (after WARCHALOWSKI 2001): 2008, 2009 – *Macrocoma cylindrica*; 2010 – *M. crassipes*; 2011, 2012 – *M. djurdjurenensis*.

18. Legs and antennae black, tibiae and tarsi sometimes dark reddish brown. Upper side sparsely haired (hairs very short), black with bronzy-cupreous metallic sheen. Legs robust, black. Aedeagus as in *henoni* (figs **2013**, **2014**). Length 5.0–6.0 mm. Perhaps a local form or subspecies of *henoni*. Described from southern Morocco ..... *peyerimhoffi* KOCHER, 1958.  
 -. Legs and antennae reddish. Upper side black, in male with fairly strong bronzy-cupreous metallic sheen, in female darker. Aedeagus not studied. Length 4.0–5.0 mm. Described from Morocco ..... *haiensis* KOCHER, 1967.  
 19. Species from Moroccan Sahara. Bronzy or cupreous sheen of upper side distinct .... **20.**  
 -. Species from Algerian Sahara. Cupreous metallic sheen of upper side feeble or absent. Length 4.5–5.0 mm. Male unknown. Perhaps conspecific with *saharica* (thesis 20) ..... *carbonaria* LEFÈVRE, 1876.  
 20. General view as in plate LIII, **phot. 477**. Upper side blackish or dark brown, with bronzy, cupreous or dark purplish metallic sheen. Legs reddish, femora and tarsi usually slightly darker, brownish-red. Pronotum slightly transverse. Legs robust,

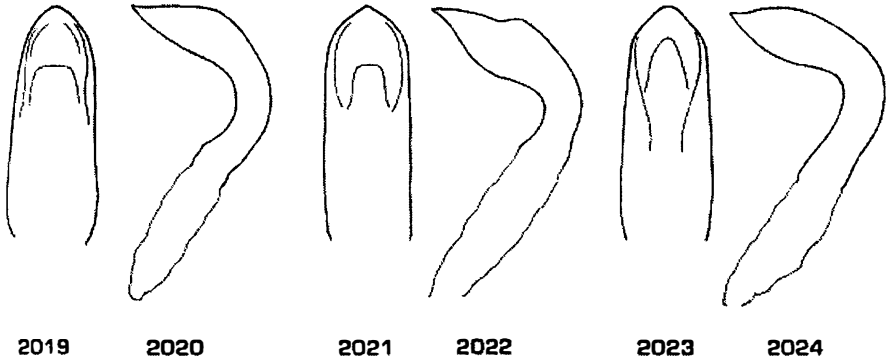
- tibiae thickened apically. Apex of aedeagus (figs **2015**, **2016**) gently arcuately emarginate. Length 4.2–5.2 mm ..... *saharica* KOCHER, 1958.
- . Upper side blackish or dark bronzy, with greenish-bronzy or greenish-cupreous, on elytra usually a little more green metallic sheen. Legs brown. Pronotum more globulous. Apex of aedeagus as in *saharica* (thesis 20), a little more deeply emarginate. Length 3.8–4.8 mm. Perhaps conspecific with *saharica* ..... *dakkai* KOCHER, 1962.
21. On elytra punctures and hairs confusedly scattered. Teeth on anterior femur extremely small (*heydeni*-group) ..... **22**.
- . On elytra hairs arranged in regular, longitudinal series (*cylindrica*-group) .... **24**.
22. General view as in plate LIV, **phot. 478**. Upper side green or greenish-bronzy, legs dark brown. Aedeagus as in figs **2017**, **2018**. Length 4.3–5.2 mm. Variations: upper side bluish (ab. *coerulea* KOCHER, 1967). Distributed in Morocco ..... *heydeni* LEFÈVRE, 1876.
- . Upper side black with bronzy or cupreous metallic reflex ..... **23**.



Figs 2013–2018 (after WARCHAŁOWSKI 2001): 2013, 2014 – *Macrocoma henoni*; 2015, 2016 – *M. saharica*; 2017, 2018 – *M. heydeni*.

23. Hairs covering upper side long and dense. Aedeagus as in *heydeni* (thesis 22). Length 4.5–5.0 mm. Described from Spanish Sahara. Perhaps a southern form of *bolivari* (antithesis 23) ..... *mateui* KOCHER, 1958.
- . General view as in plate LIV, **phot. 479**. Body black, often with very feeble metallic reflex, legs and antennae black or blackish. Hairs covering upper side rather short, semierect, moderately dense, on elytra uniformly scattered. Length 4.2–5.1 mm. Variations: upper side bluish (ab. *smirnovi* KOCHER, 1969). Aedeagus similar as in *heydeni* (thesis 22). One subspecies from AntiAtlas was described: upper side more shining and more finely punctured, apex of aedeagus a little shorter rounded (subsp. *antiatlantis* KOCHER, 1967) with variation ab. *siruensis* KOCHER, 1969 (pronotum strongly while finely punctured). Perhaps here also *M. rotroui* KOCHER, 1962. Distributed in Morocco ..... *bolivari* ESCALERA, 1914.

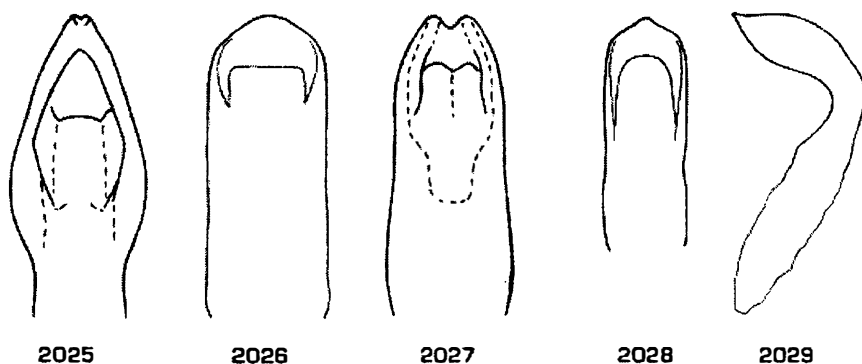
24. General view as in plate LIV, **phot. 480**. Body small, entirely rust-reddish, pronotum sometimes partly darker. Setae on pronotum adhering, on elytra squamiform, semi-erect. Fore femora without any trace of teeth. Aedeagus as in figs **2019**, **2020**. Length 3.1–4.0 mm (= *gossypiata* FAIRMAIRE, 1876). Distributed in Algeria ...  
 ..... **seriesericans** FAIRMAIRE, 1876.
- Not as above ..... **25**.
25. Body shorter than 3.0 mm. Upper side black with aeneous metallic sheen. Described from Algeria. Aedeagus not studied. Perhaps a dwarf form of *leprieuri* (thesis 26) ...  
 ..... **aeneonigra** (FAIRMAIRE, 1873).
- Body longer than 3.5 mm ..... **26**.



Figs 2019-2024 (after WARCHAŁOWSKI 2001): 2019, 2020 – *Macrocoma seriesericans*; 2021, 2022 – *M. leprieuri*; 2023, 2024 – *M. setosa*.

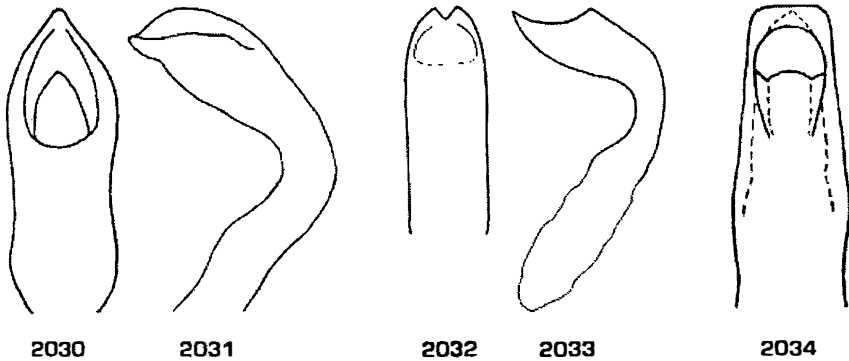
26. Punctures of elytra entirely confuse, setae squamiform, in apical part about 4–5 × longer than broad. Upper side usually black with bronzy reflex, apical part of aedeagus (figs **2021**, **2022**) rounded. Length 3.6–4.5 mm (= *melillensis* KOCHER, 1967 described from Morocco = ? *pachydera* FAIRMAIRE, 1876). Subsp. *majuscula* BECHYNÉ, 1957 described from Egypt probably not conspecific with *leprieuri*. Distributed in Morocco, Algeria and Tunisia ..... **leprieuri** (LEFÈVRE, 1876).
- General view as in plate LIV, **phot. 481**. Punctures of elytra often arranged in 3–4 longitudinal rows blurred by equally strong. Puncturation of intervals, setae thinner, in apical part about 6–8 × longer than broad. Very variable. Upper side differently coloured, usually bronzy green or green with rather strong metallic sheen, pronotum often golden-green or bronzy-cupreous (typical form). Legs entirely reddish brown or brown, femora sometimes a little darker. Apical part of aedeagus (figs **2023**, **2024**) narrowed-rounded. Length 3.8–6.2 mm (= *cylindrica vaucheri* PIC, 1907). Middle Atlas inhabits the subsp. *mesatlantica* KOCHER, 1958, on average smaller (4.0–4.5 mm), darker, with blackish legs and with more confuse punctures of elytra. This subspecies forms an aberration coloured as typical form of *setosa* s. str. (ab. *fauconnieri* KOCHER, 1958). Distributed in Morocco and Algeria, erroneously reported also from Sicily ..... **setosa** (LUCAS, 1849).

27. Species from W Asia (Asia Minor, Near East, Transcaspia, Iran, Afghanistan, Arabian Peninsula) ..... **28.**
- . Species from E Asia (Tibet) ..... **47.**
28. Habitus characteristic. General view as in plate LIV, **phot. 482.** Upper side without hairs, but with dense adherent scales forming broad, longitudinal stripes, particularly along suture. Body black, usually with bronzy metallic reflex, elytra brown, often with black, triangular, blurred spot in scutellar area. Legs robust. Aedeagus as in fig. **2025.** Length 4.3–6.0 mm. Variation: scales form on each elytron 4–5 longitudinal stripes (ab. *decemlineata* PIC, 1903). Distributed in Saudi Arabia, Oman and Iran ..... ***lefevrei*** (BALY, 1879).
- . Upper side covered by hairs or rarely almost bare ..... **29.**
29. Upper side brown without metallic reflex or black with a very weak, often barely perceptible bronzy metallic reflex ..... **30.**
- . Upper side with distinct metallic sheen ..... **34.**
30. Elytra brown without any metallic reflex ..... **31.**
- . Elytra pure black or black with very weak bronzy metallic reflex ..... **32.**
31. Elytra, underside, legs and antennae pale reddish brown to chestnut, elytra often with undefined, blurred darkenings. General view as in plate LIV, **phot. 483.** Head blackish or black, mouth parts and sometimes vertex reddish brown. Pronotum blackish or black, its anterior border reddish brown, surface with extremely feeble, often imperceptible, bronze metallic reflex. On elytra hairs semierect, arranged in slightly confused but distinct geminate longitudinal rows. On each elytron usually 8 pairs of rows. Femoral tooth very small and sharp. Apex of aedeagus (fig. **2026**) not emarginate. Length 4.0–4.7 mm (male) to 4.3–5.3 mm (female). Described from S Iran ..... ***hormuziaca*** WARCHAŁOWSKI, 2001.
- . Apex of aedeagus (fig. **2027**) emarginate. General colouration of body relatively pale. Upper side reddish brown, underside filvous clothed with close pale pubescence. Antennae flavous, first antennomere thickened, twice as long as the second. Tibiae thickened at apex. Length 4.5–5.6 mm. Known from Yemen only ...  
..... ***brunnea*** BRYANT, 1957.



Figs 2025–2029 (2025, 2027 after MEDVEDEV 1996, remaining after WARCHAŁOWSKI 2001): 2025 – *Macrocoma lefevrei*; 2026 – *M. hormuziaca*; 2027 – *M. brunnea*.

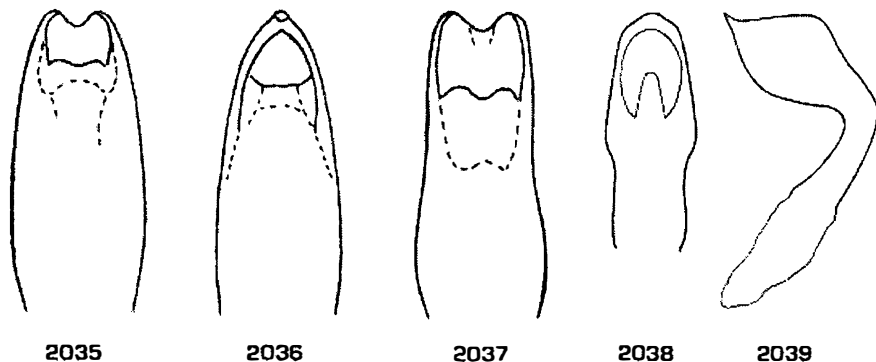
32. Upper side black without metallic reflex or black with a very feeble, often barely perceptible bronzy metallic reflex. General view as in plate LIV, **phot. 484**. Upper side pure black or with extremely feeble metallic reflex, legs and basal part of antennae uniformly red or brownish red, apical 4–5 antennomeres blackish. Elytra rather strongly and densely, randomly, similar as on pronotum punctate, covered by very short, fairly sparse, semierect, often almost or entirely disappearing, white hairs. Apex of aedeagus not incised. Length 3.3–4.9 mm (both sexes). Distributed in Asia Minor ..... **korbi** (PIC, 1901).
- Upper side black with feeble but distinctly perceptible metallic reflex, habitus as in plate LIV, **phot. 486** ..... **33**.
33. Apex of aedeagus emarginate. Upper side blackish, legs dark brown, sometimes daerk reddish-brown. Length 5.0–6.0 mm. See *brunnipes* ab. *obscuricolor* (thesis 35).
- Apex of aedeagus not emarginate. Body black with feeble bronzy reflex, legs and antennae uniformly red-brown, claw tarsomeres and apical 3–4 antennomeres sometimes slightly darkened. Elytral puncturation dense, randomly scattered, adherent hairs arranged in regular longitudinal rows, but the regularity of hair rows not always at first glance distinct. Aedeagus as in figs **2030**, **2031**. General view as in plate LIV, **phot. 485**. Length 3.0–3.7 mm (male) to 3.3–5.0 mm (female). Distributed in Central Asia ..... **sarvadensis** (SOLSKY, 1882).
- Upper side with distinct metallic sheen ..... **37**.
34. Elytra densely covered by long, white, adherent or semierect hairs, not arranged in longitudinal rows ..... **35**.
- On elytra hairs at least partly arranged in longitudinal rows or almost absent ... **37**.



Figs 2030-2034 (2030, 2031 after LOPATIN 1995; 2032, 2033 after WARCHALOWSKI 2001; 2034 after MEDVEDEV 1996): 2030, 2031 – *Macrocoma sarvadensis*; 2032, 2033 – *M. brunnipes*; 2034 – *M. sacra*.

35. Length of body 5.0–7.0 mm. Pronotum large, widest in or just behind its midlength. Legs robust, particularly in male. Upper side pure green, sometimes bronzy- or bluish green, metallic sheen strong. Legs brown, more rarely red or dark brown. General view as in plate LIV, **phot. 486**. Aedeagus as in figs **2032**, **2033**. Variation:

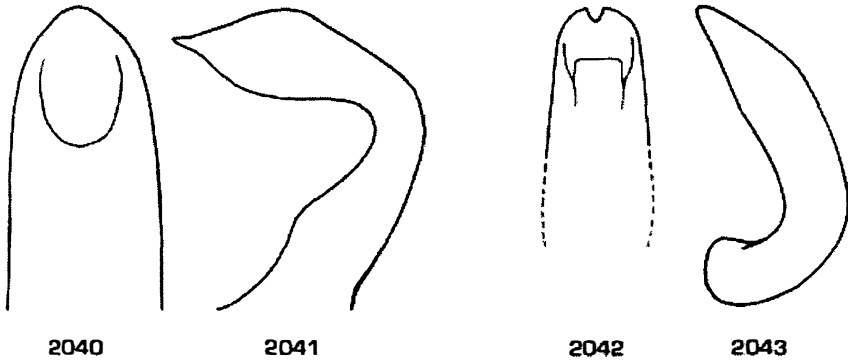
- length of body 5.0–5.5 mm, upper side dark brown or black, with feeble bronzy sheen (ab. *obscuricolor* PIC, 1905). Typical form distributed in Near East (Israel, Syria, Iraq), ab. *obscuricolor* (perhaps a distinct species) in Asia Minor ..... ***brunnipes*** (OLIVIER, 1808).
- . Length of body at most 4.0 mm ..... **36**.
36. On elytra hairs moderately dense. Femoral tooth longer. Upper side golden-bronzy, shining, loosely covered by silvery-white hairs. Apex of aedeagus truncate (fig. **2034**). On average larger. Length 3.5–4.0 mm. Described from Saudi Arabia ..... ***sacra*** (LOPATIN, 1983).
- . On elytra hairs dense, covering mostly the main surface. Femoral tooth shorter. Apex of aedeagus (fig. **2035**) emarginate. On average smaller. Length 2.8–3.7 mm. Distributed in Saudi Arabia ..... ***aladina*** DACCORDI et MEDVEDEV, 1996.
37. Elytra doubly pubescent: more erect hairs arranged in longitudinal rows, intervals covered by adherent pubescence ..... **38**.
- . On elytra rows of hairs only, intervals without distinct pubescence ..... **39**.



Figs 2035-2039 (2038, 2039 after WARCHAŁOWSKI 2001, remaining after MEDVEDEV 1996): 2035 – *Macromela aladina*; 2036 – *M. budura*; 2037 – *M. saudica*; 2038, 2039 – *M. delagrangi*.

38. Apex of aedeagus sharpened. Upper side bronzy or aeneous, erect hairs on elytra yellowish, short and thick, adherent hairs white, slightly longer and thinner than erect hairs. Antennae dark fulvous, antennomeres 8–10 darkened. Anterior margin of clypeus gently concave. Femoral tooth thin and long. Aedeagus as in fig. **2036**. Length 4.2–4.7 mm. Described from Saudi Arabia ..... ***budura*** DACCORDI et MEDVEDEV, 1996.
- . Apex of aedeagus deeply emarginate, almost bilobed (fig. **2037**). Upper side green, erect hairs white, long and thin, adherent hairs similar to erect ones, but denser. Antennae pale, antennomeres 7–11 black. Anterior margin of clypeus triangularly emarginate. Femoral tooth minute. Length 4.8–5.2 mm. Described from Saudi Arabia ..... ***saudica*** MEDVEDEV, 1996.
39. Length of body 5.2–6.2 mm. General view as in plate LV, **phot. 487**. Upper side blue, often blue-black, rarely bronzy-green. Legs dark brown, almost black. Prono-

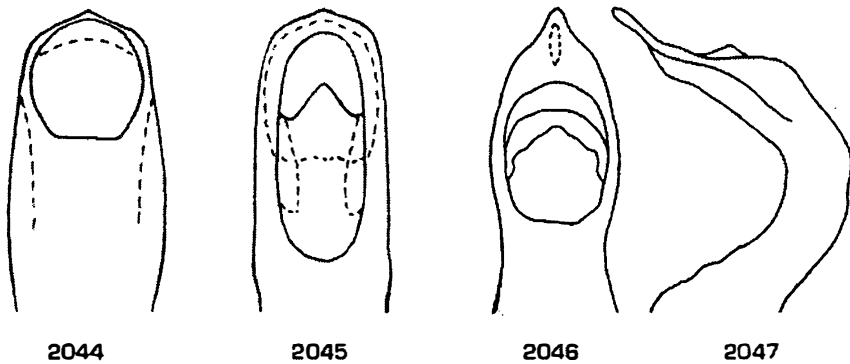
- tum subglobulous. Apex of aedeagus (figs **2038**, **2039**) not incised. Distributed in Syria and Asia Minor ..... **delagrangi** (PIC, 1898).
- Length of body at most 5.1 mm ..... **40**.
  - 40. Species from Balkan Peninsula and Asia Minor to Turkmenia ..... **41**.
  - Species from Arabian Peninsula and Afghanistan ..... **42**.
  - 41. Apex of aedeagus not incised or emarginate. Setae on elytra always present. Legs dark red, often much darker, brown, even with blackish femora. General view as in plate LV, **phot. 488**. Species from Balkan Peninsula, Cyprus, Asia Minor, Syria and Caucasian countries. Upper side black with green or bronzy metallic sheen. Aedeagus as in figs **2040**, **2041**. Length 3.3–4.6 mm (= *diversicolor* SCHAUFUSS, 1871, *aenea* WALKER, 1871, *graeca* LEFÈVRE, 1876, *balcanica* APFELBECK, 1912). Here probably also *anatolica* PIC, 1898a. Forms two subspecies: nominotypical subspecies distributed as above and subsp. *turkmena* LOPATIN, 1976 distributed in Turkmenia with less densely punctate pronotum and with punctures of elytra more distinctly arranged in longitudinal rows ..... **rubripes** (SCHAUFUSS, 1862).
  - Apex of aedeagus slightly but distinctly emarginate (figs **2042**, **2043**). Setae on elytra extremely sparse and short, sometimes elytra almost bare. Legs darker than in *rubripes* (thesis 41), often entirely black. Length 3.6–4.5 mm. Distributed in Asia Minor ..... **doboszi** BOROWIEC, 2005.



Figs 2040–2043 (2040, 2041 after WARCHAŁOWSKI 2001; 2043 after WARCHAŁOWSKI 2003): 2040, 2041 – *Macrocoma rubripes*; 2042, 2043 – *M. doboszi*.

- 42. Body more slender, sides of elytra parallel. Hind tibiae not or very feebly broadened at apex (fig. **2044**). Hair rows not quite regular, duplicate, hairs very thin. Upper side usually bicolourous: head and prothorax dark aeneous, elytra brown with metallic sheen. Labrum, antennae and legs brown. Apex of aedeagus rounded. Length 3.4–4.1 mm. Distributed in Saudi Arabia and Oman ..... **buettikeriana** DACCORDI, 1979.
- Body more robust, elytra narrowing posterad ..... **43**.
- 43. Anterior margin of clypeus almost straight. Frons angularly broadened on sides, covering the basis of antennae. Upper side bronzy, antennae, labrum and legs

- dark red. Femora slender with a small acute tooth, tibiae thin and straight, moderately broadened at apex. Tarsi very thin, tarsomere 4 almost as long as three preceding combined. Apex of aedeagus rounded (fig. 2045). Length 4.8 mm. Described from Yemen ..... **daccordii** MEDVEDEV, 1996.
- . Anterior margin of clypeus gently emarginate. Frons without broadenings .... 44.
44. Upper side dark green or eupreous, antennae and legs reddish. Setae on elytra broad, scale-like, adpressed. Apex of aedeagus with an apical tooth. Length 3.2–4.5 mm (= *leprieuri* auctorum, *arabica* DACCORDI in litt.). Variation: upper side greenish-aneous, anterior margin of clypeus more strongly emarginate (ab. *mesopotamica* PIC, 1898). Distributed in Arabian Peninsula (typical form) and in Mesopotamia ..... **millingeni** PIC, 1898.
- . Setae on elytra not scale-like, straight, less adpressed, arranged in distinct rows. Upper side dark metallic green ..... 45

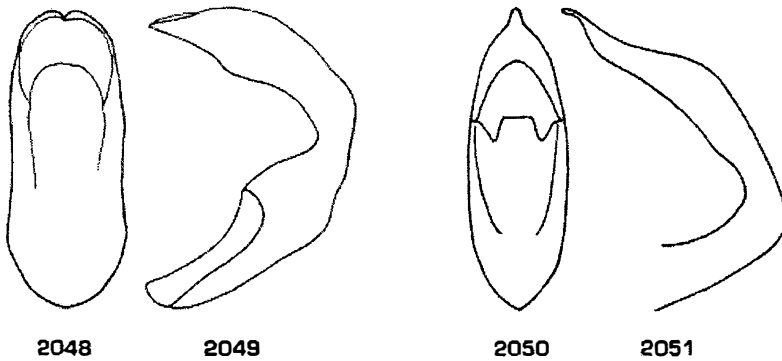


Figs 2044–2047 (2044, 2045 after MEDVEDEV 1996; 2046, 2047 after LOPATIN 1995): 2044 – *Macrocoma buettikeriana*; 2045 – *M. daccordii*; 2046, 2047 – *M. micula*.

45. Larger, length of body 3.8–5.1 mm ..... 46.
- . Smaller, length of body 3.0–3.6 mm. Externally very similar to *marquardtii* (thesis 46), aedeagus (figs 2046, 2047) also similarly shaped. Described from Afghanistan ..... **micula** LOPATIN, 1995.
46. Aedeagus (figs 2048, 2049) in dorsal view broad, its apex broadly rounded with small excision. Hairs on elytra somewhat irregularly arranged in longitudinal rows. Length 4.6–5.1 mm. Described from Afghanistan ..... **schereri** LOPATIN, 1995.
- . Aedeagus (figs 2050, 2051) more slender, its apical part narrowed anteriorly, lateral sides slightly rounded, apex with narrow lamella ..... **marquardtii** (BREIT, 1913).
47. Legs uniformly yellowish or pale reddish, tarsi more or less darkened. Elytra relatively strong and densely punctured, the puncturation arranged in irregular rows. Aedeagus not studied. Length about 5.0 mm. Described from Tibet ..... **affinis** (BREIT, 1913).



- Femora black with metallis reflex, tibiae in apical part and tarsi darkened. Setae on elytra short, fine, slightly bent and more adpressed, irregular rows of setae indistinct. Upper side greenish bronzy. Length about 4.0 mm. Described from Tibet ..... **banghaasi** (BREIT, 1913).



Figs 2048-2051 (after LOPATIN 1995): 2048, 2049 – *Macrocoma schereri*; 2050 – *M. marquardtii*.

### Genus *Malegia* LEFÈVRE, 1883

The genus comprises about 25 species, distributed in Eurasia and Africa. In discussed area occur 9 species. Here probably also the Oriental ?genus *Microlypesthes* PIC, 1936, who one insufficiently studied species, *M. aeneus* CHEN, 1940, was reported also from NE China.

#### Key to species

1. Pronotum relatively short and broad, at least 1.5 × broader than long, lateral sides rather feebly rounded ..... **2.**
- Pronotum longer, 1.1–1.3 × broader than long sometimes slightly narrowed posteriorly, lateral sides usually distinctly rounded ..... **3.**
2. Upper side black, usually with very weak, bluish, greenish or bronzy metallic reflex. Puncturation of pronotum dense and deep, interstices reticulated or rusose. Hairs on upper side long (100–140 μm), adpressed, usually somewhat shaggy. General view as in plate LV, **phot. 490**. Length 2.3–3.6 mm, large females often slightly longer (= *hirsuta* JACOBSON, 1894, *uralensis* REITTER, 1912). Rather broadly distributed in Transcaspia ..... **turkestanica** (REITTER, 1890).
- Upper side shining, black with greenish metallic reflex, covered by white relatively dense hairs, here and there thicker, scale-like. Antennae slender, basal 5–6 antennomeres pale, remaining black. Length 3.0–3.5 mm. Described from Afghanistan ... ..... **hauseri** PIC, 1903.
3. Species from E Asia. Upper side with distinct bronzy metallic shine, more rarely black with dark green reflex. Femora and tibiae entirely dark yellow, last tarsomeres

- slightly darkened. Antennae in basal half pale yellow, last 5 antennomeres black. Pronotum granulated, hairs on elytra moderately long, white, adpressed. Length 2.0–2.3 mm (= *flavipes* CHŪJŌ, 1942). Distributed in Ussuria, Korea and NW China ..... ***aenea*** CHEN, 1940.
- . Species from other areas ..... 4
4. Small species. Hairs on elytra long, white, adpressed, in fresh specimens arranged in longitudinal stripes. Pronotum about 1.2 × broader than long. Upper side black with distinct bronzy shine. General view as in plate LV, **phot. 489**. Length 1.8–2.5 mm. Distributed in Caucasian countries ..... ***colchica*** REITTER, 1912.
- . On average larger species. Hairs on elytra not arranged in longitudinal stripes .... 5
5. Punctuation in anterior 1/4–1/3 of pronotum distinctly finer and shallower than on central or basal part, interstices shining. Hairs on elytra white, moderately long (on average about 40–45 μm), semiadpressed. Upper side pure black or black with weak bronzy reflex, shining, punctuation of elytra somewhat rasp-like. Length 2.3–3.5 mm (= *weisei* REITTER, 1912). Distributed in Turkmenistan and Uzbekistan ..... ***jacobsoni*** SUMAKOV, 1901.
- . Punctuation on anterior part of pronotum not distinctly finer and shallower than on remaining parts of pronotal surface ..... 6
6. Upper side strongly shining, cupreo-aeeneous. Head and pronotum rather strongly, elytra more finely punctured. Labrum, legs and antennae entirely yellow. Length 2.0–2.8 mm. Described from Egypt ..... ***letourneuxi*** LEFÈVRE, 1883.
- . Upper side not particularly strongly shining ..... 7
7. Pronotum strongly rounded laterally, subspherical, densely covered by strong punctuation. In fresh specimens hairs on elytra arranged in longitudinal stripes, similarly as in *colchica* (thesis 4). Length 2.0–3.0 mm. Described from Iraq ..... ***asiatica*** PIC, 1894.
- . Pronotum approximately as long as broad, subcylindrical, its lateral sides gently rounded. Elytra blackish, their apex lightened, reddish. Two species from Arabian Peninsula ..... 8
8. Larger. Elytra blackish, their apex paler, reddish. Punctuation of pronotum somewhat umbiliform. Length about 3.5 mm. Described from Aden ..... ***donckieri*** PIC, 1904.
- . Smaller. Elytra unicolorous. Punctuation of pronotum fine, not umbiliform. Length 2.4–2.9 mm. Described from Saudi Arabia ..... ***arabica*** DACCORDI, 1979.

#### Genus *Mecistes* CHAPUIS, 1874

The genus *Mecistes* contains three Ethiopian and one Arabian species. Body entirely black, basal antennomeres partly red, upper side with weak metallic reflex. Scale-like setae arranged in regular, longitudinal rows, intervals convex, shining. Antennomeres 7–11 thickened, all femora with a small tooth beneath. Length 3.6–4.5 mm. Described from Saudi Arabia ..... ***saudicus*** MEDVEDEV, 1997.

Genus *Pachnephoptrus* REITTER, 1892

One species only. General view as in plate LV, **phot. 491**. Upper side very tightly covered by bicolorous (white and light testaceous) scales forming irregular spots. Legs and antennae pale yellow. Length about 4.0 mm. Described from Transcaucasia, reported also from Turkmenia ..... ***weisei*** REITTER, 1892.

Genus *Pachnephorus* REDTENBACHER, 1845

Unclear species *Pachnephorus curtus* PIC, 1921, from China and *P. graecus* PIC, 1901, described from Greece (possibly synonymous with *P. corinthius* FAIRMAIRE, 1861), not included in the key.

Key to subgenera

1. On lateral sides of pronotum marginal ridge distinct only in anterior part .....  
..... ***Pachnephoriscus*** (p. 401).
- On lateral sides of pronotum marginal ridge distinct on whole length .....  
..... ***Pachnephorus*** s. str. (p. 401).

Subgenus *Pachnephoriscus* LOPATIN, 1976

The subgenus *Pachnephoriscus* includes two species.

Key to species

1. Upper side pitchy black, shining, antennae rusty-reddish, femora brown, tibiae and tarsi rusty-yellow. Scales on upper side bicolorous: on head, pronotum and in apical part of elytra white, on remaining part of elytra pale rusty-yellow. Punctures on pronotum densely scattered, slightly elongate. Primary punctures of elytra strong, arranged in regular, dense rows. On each interval a row of very fine and sparse secondary points. Length 2.5 mm. Described from Usbekistan .....  
..... ***jacobsoni*** LOPATIN, 1976.
- Pronotum pitchy black, elytra brown-grey, legs rusty-brown. Upperside densely covered by scales. Pronotum 1.5 × longer than broad, feebly convex. Elytra ovale, but with well-developed humeral calli, primary punctures moderately strong, each interval with a row of secondary punctures. Length 2.0 mm (male) to 3.0 mm (female). Described from S. Afghanistan ..... ***kaszabi*** LOPATIN, 1962.

Subgenus *Pachnephorus* s. str.

The nominotypical subgenus includes almost 40 species, distributed in Eurasia and Africa. In discussed area about 24 species.

Key to species

1. Humeral calli well-developed, strongly pronounced. Elytra not oval, with short transverse impression behind humeral calli ..... **3**.
- Humeral calli very feebly pronounced or almost absent. Elytra oval without transverse impression behind humeral calli ..... **2**.
2. Smaller. Upper side without scales, sparsely covered by very short, fine hairs. Body black with feeble bronzy metallic reflex, legs and antennae reddish brown. Underside covered mainly with adpressed setae. General view as in plate LV, **phot. 492**. Length 2.2–2.8 mm. Variation: metallic reflex on elytra bluish or greenish, pronotum bronzy (ab. *micantipennis* REITTER, 1901). Distributed in Crimea, southern Russia and Asia Minor ..... **robustus** DESBROCHERS, 1870.
- Larger. Pronotum along lateral margin with a stripe of white scales, remaining part of upper side covered by short, fine hairs only. Body black with bronzy metallic sheen, legs and antennae reddish brown. Underside covered mainly with white scales. Length about 3.2 mm. Distributed in Caucasian countries ..... **lateralis** REITTER, 1901.
3. Secondary punctures covering elytral intervals distinct, confused ..... **4**.
- Secondary punctures on elytra indistinct or arranged in a row running along the middle of each interval ..... **11**.
4. W Palaearctic species, distributed in Europe, Mediterranean area, Caucasian countries and Transcaspia ..... **6**.
- E Asiatic species. Body cylindrical, black with graphite or leady reflex, elytra rather uniformly, but not very densely covered by short scales ..... **5**.
5. Larger. On elytra rows of primary punctures strong and very regular, secondary punctures distinct and deep impressed, irregular scattered on intervals. Length 2.5–3.3 mm (= *porosus* BALY, 1878, *seriatus* LEFÈVRE, 1887, *plagiatus* JACOBY, 1892). Distributed from India and Indochina to M China, reported also from Korea ..... **brettinghami** BALY, 1878.
- Smaller. In scutellar area primary punctures very strong and more or less random, secondary punctures very strong, in anterior half of elytra at least partly as strong as the primary punctures. Pronotum very strong and deep, in basal part very densely punctured. Length 2.2–2.6 mm. Known from Korea only. Probably conspecific with *lewisii* (antithesis 12) ..... **squamosus** CHŪJŌ, 1936.
6. Body entirely pale coloured, rusty-yellow. Scales on upper side very densely scattered, small, silvery white. Puncturation of elytra rather shallow. Length 3.0 mm. Described from Usbekistan ..... **fulvus** LOPATIN, 1976.
- Body entirely dark, black or pitchy black, often with feeble metallic reflex ..... **7**.
7. Upper side black with feeble metallic reflex, rather sparsely covered by scales. General view as in plate LV, **phot. 493**. Elytra short, about 1.5 × longer than broad. Length 2.8–3.5 mm (= *arenarius* PANZER, 1797, *aeneus* SCHNEIDER, 1792, *carbonarius* GRIMMER, 1841, *lepidopterus* KÜSTER, 1846). Distributed in a great part of Europe, from western France and Belgium to southern Finland, northern Italy, Balkan Peninsula and Asia Minor ..... **pilosus** (ROSSI 1790).
- Upper side almost entirely covered by scales. Elytra more oblong ..... **8**.
8. Upper side pitchy black, without metallic reflex. Scales broad, very feeble incised, grey. Length 2.2–2.8 mm. Distributed in Balkan Peninsula, Asia Minor, southern Russia and Near East ..... **canus** WEISE, 1882.

- Upper side with bronzy, sometimes with cupreous-bronzy or greenish bronzy metallic reflex ..... **9.**
- 9. Primary rows of punctures on elytra regular and distinct ..... **10.**
- Primary rows of punctures on elytra somewhat indistinct, antennae in apical part only feebly darkened. Length 2.5–3.5 mm (= *lefevrei* PIC, 1894). Perhaps a form or race of *tessellatus* (antithesis 10). Described from Iraq, reported also from Armenia and Iran ..... **ruficornis** LEFÈVRE, 1876.
- 10. Larger. Externally similar to *brunneus* (thesis 12), but paler coloured. Length of body 3.2 mm (male) to 3.7 mm (female). Described from Yemen based on one pair of specimens ..... **yemenicus** LOPATIN, 2001.
- Smaller. Primary rows of punctures on elytra distinct, regular. Antenna in apical part blackened. Upper side covered by oblong, variously coloured (whitish, grey or yellowish) scales forming irregular spots. Length 2.3–2.9 mm. Variation: punctures of upper side finer, body larger and rather stout (ab. *sabulosus* GEBLER, 1848). Distributed in a great part of Europe (northern Spain, southern France, Italy, basin of Danube, Balkan Peninsula, eastern Poland, Ukraine, Russia, Asia Minor, Caucasian countries) and in Central Asia to Mongolia ..... **tessellatus** (DUFTSCHMID, 1825).
- 11. Secondary punctures on intervals absent ..... **12.**
- Secondary punctures present as a single row running along the middle of each interval ..... **13.**
- 12. Intervals very narrow, here and there slightly rugose. Upper side, legs and antennae rusty-grey, not very thickly covered by scales. Scales on pronotum incised apically, situated mostly transversely. Scales on elytra entire, situated longitudinally. General view as in plate LV, **phot. 494**. Underside dark grey. Length 3.0 mm. Described from Turkmenistan ..... **brunneus** MEDVEDEV, 1957.
- Intervals broad, flat. Body stout, elytra much broader than pronotum. General view as in plate LV, **phot. 495**. Upper side covered by whitish, yellowish and pale rusty-brownish scales, forming irregularly scattered spots. Length 2.6–3.2 mm (= *squamosus* CHŪJÓ, 1936). Distributed in Indochina, China, E Siberia and Korea ..... **lewisii** BALY, 1878.
- 13. Punctures on lateral and posterior part of pronotum very strong and deep .... **14.**
- Punctures of pronotum not particularly strong ..... **16.**
- 14. Punctures on lateral and posterior part of pronotum formed as short, transversal grooves or hollows. Proepisterna distinctly punctate. Upper side black or pitchy black, shining, metallic reflex very feeble ..... **15.**
- Body rather slender. Punctures on lateral and posterior part of pronotum strong but normal. Proepisterna barely punctate. Upper side almost without scales. Length 2.8–3.0 mm. Described from Israel. Perhaps a geographical form of *villosus* ..... **syriacus** REITTER, 1886.
- 15. Body not slender. General view as in plate LVI, **phot. 496**. White scales on elytra not numerous, grouped in spots or almost absent. Lateral furrows of prosternum distinctly convergent posteriad. Length 2.6–4.0 mm (= *schlumbergeri* DUFOUR, 1851, *aspericollis* FAIRMAIRE, 1861, *rugaticollis* MILLER, 1862). Variation: metallic reflex of upper side bluish (ab. *chalybaeus* WEISE, 1882). Distributed in Sicily, whole Italy, basin of Danube, Balkan Peninsula, Asia Minor, southern Ukraine and Caucasian countries ..... **villosus** (DUFTSCHMID, 1825).

- Outline and colouration of body as in *villosus* (thesis 15). Lateral furrows of prosternum feebly convergent posteriad. Distributed in Romania, Bulgaria, Greece, Crete, Cyprus and Turkey. In opinion of the majority of authors conspecific with *villosus* ..... ***silvanae*** DACCORDI, 1977.
- 16. Sides of pronotum with a longitudinal stripe of white scales. Upper side black with metallish reflex, usually bluish or greenish, rarely bronzy. Legs and antennae rusty-yellow. Length 2.8–4.0 mm. Described from Turkmenistan ..... ***turcomanicus*** MEDVEDEV, 1957.
- Sides of pronotum without longitudinal stripe of white scales ..... 17.
- 17. Upper side (rather sparcely) covered by scales. Body usually reddish brown, pronotum often darker, upper side with bronzy metallic reflex. Pronotum strongly and densely punctured. On pronotum scales broader, deeply incised, on elytra narrow. Length 2.9–3.4 mm (= *impressus* ROSENHAUER, 1856, *convexicollis* BALY, 1867). Distributed in south-western part of Europe and in North Africa; *impressus* and *convexicollis*, considered as conspecific with *bistriatus* occurs in almost whole Palaetropical Region (Central Africa, Madagaskar, India, Philippines) ..... ***bistriatus*** MULSANT, 1852.
- Upper side covered by hairs, setae or very thin seta-like scales ..... 18.
- 18. Upper side rather densely covered by white, erect, fine, bifid seta-like scales, arranged in regular rows. Punctures of pronotum moderately strong, deep, not very dense. Colouration of pronotum and elytra usually black, metallic reflex bluish or absent. Length about 3.0 mm. Variation: upper side black with bronzy-greenish metallic reflex (ab. *baeticus* WEISE, 1882). Typical form occurs in southern France, ab. *brucki* predominate in Spain, reported also from Sicily ..... ***brucki*** FAIRMAIRE, 1861.
- Upper side sparsely covered by short adressed setae ..... 19.
- 19. Punctures of pronotum fine, about 4 × smaller than punctures of elytra. Upper side pitchy brown with feeble but distinct bronzy metallic reflex ..... 20.
- Punctures of pronotum moderately strong, at most 2 × or not very significantly smaller than punctures of elytra ..... 21.
- 20. On average smaller. On elytra hair-like scales situated mostly or exclusively on rows. Length 2.9–3.3 mm (= *leprieuri* PIC, 1898). Known from southern Spain, Corsica, Sicily, Morocco and Algeria ..... ***laevicollis*** FAIRMAIRE, 1861.
- On average larger. General view as in plate LVI, **phot. 497**. On elytra hair-like scales situated also on intervals. Length 3.0–3.5 mm. Distributed in Morocco and Algeria ..... ***hispidulus*** FAIRMAIRE, 1866.
- 21. On average smaller (usually about 2.9 mm). Punctures of pronotum relatively fine, particularly in the middle. Upper side indistinctly reticulate with bronzy, rarely dark greenish, rather strong metallic sheen, never bicolorous. Length 2.6–3.7 mm (= *brucki* REITTER, 1901 nec FAIRMAIRE, 1861). Distributed in southern Italy, Sicily and Greece. Here probably *graecus* PIC, 1901 ..... ***corinthius*** FAIRMAIRE, 1861.
- On average larger (usually about 3.5 mm). General view as in plate LVI, **phot. 498**. Punctures of pronotum stronger. Upper side mainly reticulate with feeble bronzy-greenish reflex, often bicolorous. Length 3.0–3.9 mm. Variation: upper side bicolorous; elytra green or bluish, pronotum bronzy (ab. *hipponensis* DESBROCHERS, 1870). Distributed in southern France, Iberian Peninsula, Morocco and Algeria ..... ***cylindricus*** LUCAS, 1849.

Genus *Pales* REDTENBACHER, 1858

*Eupales* LEFÈVRE, 1885

One species only. General view as in plate LVII, **phot. 510**. Upper side green with vivid metallic gloss, often with golden sheen. Antennae and legs light orange, underside black with anal segment of abdomen orange. Eyes very convex. Length 4.5–6.0 mm. Distributed mainly in Balkan Peninsula and in Hungary ..... **ulema** (GERMAR, 1813).

Genus *Parnops* JACOBSON, 1894

To the genus *Parnops* belong two species distributed in Asia.

Key to species

1. Pronotum with anterior angles rounded, its lateral side in basal half slightly but distinctly concave. Frons, vertex and anterior margin of pronotum black. Length 6.4 mm (= *ordossana* JACOBSON, 1910). Distributed in N China (Inner Mongolia and Manchuria) ..... **atriceps** PIC, 1903.
- Pronotum with anterior angles not rounded, its lateral side in basal half straight or almost straight. Frons, vertex, anterior margin of pronotum and apex of elytra reddish brown. Upper side thickly covered by scale-like hairs, in nominotypical form greyish white with a greenish hue. Aedeagus as in figs **2052**, **2053**, General view as in plate LVI, **phot. 499**. Length 5.0–6.0 mm. From Kirgisia were described subspecies *P. glasunowi ferghanica* LOPATIN, 1976, somewhat larger (6.0–7.0 mm), with vertex and apex of elytra black, scale-like hairs covering the upper side pale rusty-yellowish. Distributed in Transcaspia and N China (Kansu) ..... **glasunowi** JACOBSON, 1894.

Genus *Phortus* WEISE, 1899

One species only. Body dark reddish with copper-bronzy metallic sheen. Pronotum transversally wrinkled, elytra finely punctured. Upper side covered by almost adhering, moderately dense whitish hairs. Length 2.5–3.0 mm. Insufficiently studied and doubtful species, described from Crete ..... **creticus** WEISE, 1899.

Genus *Rhodopaea* GRUEV et TOMOV, 1968

One species only. General view as in plate LVI, **phot. 500**. Body entirely pale rusty-brownish, oval, evenly convex, elytra without humeral calli. Upper side covered by thickened setae (thin scales), on pronotum adpressed, on elytra semi-erect. Length 4.1–6.0 mm. Endemic to Rhodope Mountains in Bulgaria ..... **angelovi** GRUEV et TOMOV, 1968.

Genus *Scelodonta* WESTWOOD, 1837

Genus *Scelodonta* comprises over 50 species, distributed mainly in Palaetropical area (Africa, SE Asia, Indonesia). One species described from Australia belongs probably not here. In discussed area two species.

Key to species

1. Antennae rather robust, subapical antennomeres less than twice as long as broad. Interstices of pronotal puncturation form in basal part weak transverse rugosities. General view as in plate LVI, **phot. 501**. Body black, upper side with metallic reflex, usually aeneous, in some cases bluish, greenish or cupreous. Length 3.2–4.0 mm. Distributed in China, Taiwan and Japan (Honshu, Shikoku, Kyushu) ..... *lewisii* BALY, 1874.
- . Antennae rather slender, subapical antennomeres more than twice as long as broad. Transverse rugosities on pronotum more elevated, covering a great part of pronotum. Colouring of body as in preceding species. Length 3.8–4.2 mm. Distributed in Taiwan, Ryukyu Is. and Japan (Kyushu) ..... *sauteri* CHŪJŌ, 1938.

Genus *Trichochrysea* BALY, 1861

Almost 50 species, distributed mainly in E Asia, Indonesia and Philippines, are included in the genus *Trichochrysea*. In the discussed area 7 species.

Key to species

1. Elytra covered by long erect hairs and adpressed pubescence or short hairs ..... **2**.
- . Elytra covered by long erect hairs only. Here some non-palaeartic species from S China and other parts of Palaetropical area.
2. Shorter hairs of elytra semierect, not forming a transverse or oblique band behind middle ..... **6**.
- . Shorter hairs of elytra partly adpressed, forming a pale band behind middle and sometimes also indistinct spots at apex and at lateral sides ..... **3**.
3. Short adpressed hairs on elytra dark yellow or rusty-reddish. Ground of upper side with bluish or bronzy green metallic reflex, legs with purplish metallic reflex. Length 6.0 mm. Described from Tibet ..... *undulata* PIC, 1927.
- . Short adpressed hairs on elytra silvery, whitish or pale grey. Body blackish with cupreous or aeneous metallic reflex, tibiae entirely or in basal part only dark reddish ..... **4**.
4. Short hairs on elytra semierect or erect, forming vague bands at side behind middle. General view as in plate LVI, **phot. 502**. Length 6.5–7.2 mm. Distributed in N China (Kansu). Possibly a form of *japana* (thesis 5) ... *sinensis* CHEN, 1940.
- . Short hairs on elytra adpressed, forming an arched band behind middle ..... **5**.
5. Apical palpomere in male thickened and truncate. Elytra slightly emarginate before apex, apical angle of elytra less than 90°. Length 6.5–7.5 mm. Distributed broadly in China and in Japan (Honshu), reported also from Korea ..... *japana* (MOTSCHULSKY, 1857).



- Apical palpomere in male not thickened and only its very tip very shortly truncate. Elytra not emarginate at apex, apical angle about 90°. Length 5.7–7.7 mm. Distributed in Japan and Taiwan. Forms three local forms, described as subspecies: interstices of pronotal punctures in basal part reticulate, in anterior part finely punctulate and shining (subsp. *taiwana* KOMIYA, 1985), interstices of pronotal punctures not reticulate, metallic reflex of upper side bronzy (nominotypical subspecies), interstices of pronotal punctures not reticulate, metallic reflex of upper side cupreous (subsp. *meridiojaponica* KOMIYA, 1985). Distributed in Taiwan (subsp. *taiwana*), Ryukyu Archipelago (nominotypical subspecies) and in Kyushu (subsp. *meridiojaponica*) ..... **okinawana** NAKANE, 1956.
- 6. Marginal ridge on lateral side of pronotum absent or visible as a trace only ... 7.
- Marginal ridge on lateral side of pronotum developed in whole or almost whole length ..... **8**.
- 7. Inner margin of elytral epipleura indistinct before apex. Aedeagus (figs **2056, 2057**) on apex sharpened. Upper side black, usually with feeble bluish (rarely aeneous) reflex, sometimes almost pure black. General view as in plate LVI, **phot. 503**. Length 6.7–8.5 mm. Distributed in Tadzhikistan, from Uzbekistan is described a subspecies, see thesis 8 ..... **amygdali** (OGLOBLIN, 1941).
- Inner margin of elytral epipleura sharp and distinct before apex. Apex of aedeagus (figs **2054, 2055**) deeply and broadly, triangularly incised. Upper side black with cupreous or bronzy metallic reflex. General view as in plate LVI, **phot. 504**. Length 5.0–7.0 mm. Distributed in Kirgisia ..... **arnoldii** (MEDVEDEV, 1957).
- 8. On average larger. Apex of aedeagus (figs **2056, 2057**) sharpened. Upper side dark bronzy with weak golden hue. Labrum, antennae, tibiae and tarsi rusty-reddish. Length about 6.0 mm. Described from Uzbekistan (mountains Nuratau) ...  
..... **amygdali** subsp. **nuratavica** LOPATIN, 1976.
- On average smaller. Apex of aedeagus (figs **2058, 2059**) shortly transversely truncate. Upper side black with bluish, greenish or bronzy metallic reflex. Legs blackish with weak metallic reflex, antennae black with 3–4 basal antennomeres at least partly rusty-reddish. General view as in plate LVII, **phot. 505**. Length 3.5–6.0 mm (= *hauseri* WEISE, 1890, *bipubescens* PIC, 1907). Distributed in Uzbekistan and S Kazakhstan ..... **occidentalis** (WEISE, 1887).

### Genus *Trichotheca* BALY, 1860

The genus *Trichotheca* includes 6 species, distributed in India and China. In discussed area one species only. Body entirely pale reddish brown or testaceous In darker coloured specimens on vertex a slightly darker spot, on pronotum darkened median stripe, on each elytron a darker longitudinal stripe. Elytra, particularly in hind part, covered by moderately long hairs. Primary elytral puncturation arranged in regular, longitudinal rows. General view as in plate LVII, **phot. 506**. Length 3.6–4.1 mm. Described from Tibet ..... **variabilis** GRESSIT et KIMOTO, 1961.

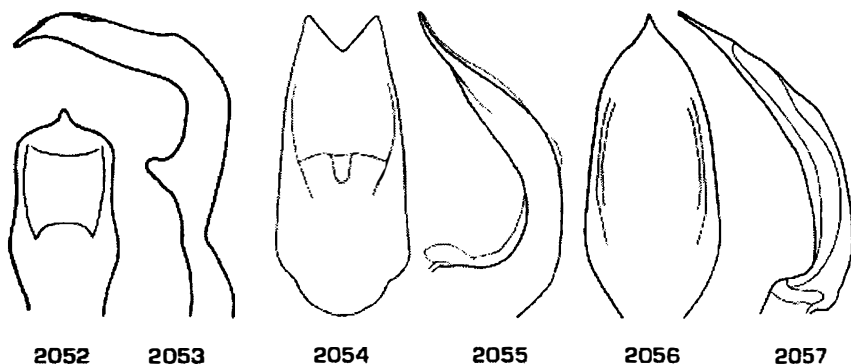
Genus *Xanthonia* comprises 17 species distributed in N and M America, Japan and China. In discussed area two species.

Key to species

1. Body reddish brown to dirty brown. Antennae in apical part darkened, usually dark brown. Metasternum and abdomen pitchy-black, elytral suture piceous or black, usually broadened in the midlength. In darker coloured specimens pronotum without darker areas in the middle and laterally. Length about 3.0 mm. Described from N China (Kansu) ..... ***collaris*** CHEN, 1940.
- . Body fulvous, in some darker coloured specimens underside, lateral and sutural margins of elytra, sometimes also middle and lateral sides of pronotum darkened. Blackish sutural stripe not broadened in the middle. General view as in plate LVII, **phot. 507**. Length 3.2 mm. On Hachijo Island forms a subspecies: body chestnut brown, head and ground of elytra paler, testaceous (subsp. *hachijoensis* OHNO, 1960). Variations: ground of elytra also chestnut brown (*hachijoensis* ab. *obscura* OHNO, 1960), upper side entirely pale, scutellum chestnut brown (*hachijoensis* ab. *scutellata* OHNO, 1960). Distributed in Japan (Honshu, Shikoku, Kyushu, Ryukyu Isl.) ..... ***placida*** BALY, 1874.

Tribe *Colasposomatini*

To the tribe *Colasposomatini* belong 22 genera distributed mostly in Africa. In discussed area two genera only. Here included tentatively also the genus *Weigelia*, having a distinct median groove on pygidium, but allied rather to the genus *Colaspopides* (tribe *Eumolpini*).



Figs 2052-2057 (after LOPATIN 1977): 2052, 2053 – *Parnops glasunovi*; 2054, 2055 – *Trichochrysea arnoldii*; 2056, 2057 – *T. amygdali*.

## Key to genera

1. Elytra covered by transverse rugosities on whole surface ..... *Abiromorphus* (p. 409).
- Elytra covered by rugosities at most along lateral sides ..... **2.**
2. Claws bifid, elytra laterally with more or less developed rugosities ..... *Colasposoma* (p. 409).
- Claws incised, elytra without rugosities ..... *Weigelia* (p. 409).

### Genus *Abiromorphus* PIC, 1924

One species only. Upper side covered by long, erect hairs, upper side usually metallic green, more rarely blue, sometimes with bronzy or golden reflex. General view as in plate LVII, **phot. 509**. Length 7.5–9.5 mm. Distributed in E China from Kiangsu to Kirin, reported also from Korea ..... *anceyi* PIC, 1924.

### Genus *Colasposoma* LAPORTE, 1833

Upper side with metallic shine. Body relatively stout, pronotum very short and broad, usually 2.7–3.8 × broader than long. Puncturation of elytra random, sometimes partly arranged in semiregular rows. Lateral part of elytra strongly punctate, usually uneven, often covered by rugosities and with a short carina starting from humeral callosity. The genus contains almost 170 species, occurring mostly in Palaeotropical area. In discussed area two species.

#### Key to species

1. Larger species. Upper side in the typical form bicolorous: head and pronotum violaceous, elytra reddish with cupreous metallic shine. In male mid tibiae in apical part strongly curved and strongly broadened at apex. Length 6.5–8.0 mm (= *thibetanum* JACOBY, 1891, *purpureum* PIC, 1937, *bonnevili* PIC, 1943, *rufipenne* PIC, 1943). Variation: upperside unicolorous, blue or violaceous (ab. *coeruleatum* BALY, 1879). Distributed in India and Indochina, reported also from Tibet ..... *pretiosum* BALY, 1860.
- Smaller species. In male mid tibiae almost straight and moderately broadened at apex. Lateral borders of elytra strongly punctured, but never rugose. Upper side unicolorous, aeneous, green or blue. General view as in plate LVII, **phot. 508**. Length 5.0–6.0 mm (= *cyaneum* MOTSCHULSKY, 1860, = *mongolicum* MOTSCHULSKY, 1860). Distributed in E Siberia, N China, Korea and Japan ..... *dauricum* (MANNERHEIM, 1849).

### Genus *Weigelia* MEDVEDEV, 2005

One species only. Body moderately elongate. Upper side glabrous, bright metallic green, underside dark green. Labrum, antennae and legs dark yellow, hind magrigin of

anal sternite reddish. Length 4.0 mm (male) to 4.5 mm (female). Aedeagus as in figs **2061, 2062**. Described recently from Turkey (S Anatolia), based on three specimens ...  
 ..... **fritzlari** MEDVEDEV, 2005.

### Tribe *Eumolpini*

#### Key to genera

1. Groove above eye shallow, not or feebly broadened behind. Apical part of antennae not distinctly flattened ..... **2**.
- . Groove above eye deep, broadened behind. Apical part of antennae flattened and much broader than proximal part ..... **Platycorynus** (p. 411).
2. Outline of body broadly oval, basal part of pronotum almost as broad as basal part of elytra, humeri not protruding. Length under 6.0 mm ..... **Colaspoides** (p. 411).
- . Outline of body more parallel, basal part of pronotum narrower than basal part of elytra, humeri protruding or at least distinct. Length over 8.0 mm ..... **3**.
3. Mesosternum between coxae transverse (= *Chrysochus* REDTENBACHER, 1845). Body black with blue or violaceous metallic sheen ..... **Eumolpus** (p. 411).
- . Mesosternum between coxae longitudinal ..... **Chrysochares** (p. 410).

### Genus *Chrysochares* MORAWITZ, 1861

To the genus *Chrysochares* belong two species distributed from Caucasian countries to NW China.

#### Key to species

1. Larger. Pronotum broad, covered by shallow and not dense scattered punctation. General view as in plate LVIII, **phot. 520**. Upper side mainly metallic green with golden- purplish- blue or violaceous sheen. Underside and legs black with greenish or bluish metallic reflex. Length 13.0–17.5 mm (= *alhangi* PALLAS, 1771, *sibiricus* FRÖLICH, 1792). Variations: body greenish blue, elytra purplish or cupreous (typical form, rather rare), body greenish-blue, elytra violaceous or purplish-violaceous (ab. *violaceomixtus* JACOBSON, 1894), body green, elytra greenish-blue (ab. *coerulescens* JACOBSON, 1894), body bronzy-green, pronotum with cupreous sheen (ab. *ignitus* JACOBSON, 1894). Represented by two subspecies: frons and clypeus sparsely and shallowly punctate, pronotum broader (nominotypical subspecies), frons and clypeus more strongly punctate, pronotum narrower (subsp. *orientalis* LOPATIN, 1963). Nominotypical subspecies distributed in Caucasian countries and in southern part of European Russia, subspecies *orientalis* in Transcaспia ..... **asiaticus** (PALLAS, 1771).
- . Smaller. Pronotum narrow, covered by not uniform, strong and dense punctation. Length 10.0–13.5 mm. Distributed from E Usbekistan to Mongolia and NW China ..... **punctatus** (GEBLER, 1845).

Genus *Colaspoides* LAPORTE, 1833

A large genus comprising over 160 species distributed mainly in the tropical zone of Old and New World. In discussed area one species only. Upper side golden green with strong metallic gloss. Ventral surface entirely black, legs much paler, reddish brown, antennae dark brown or pitchy with 4 or 5 basal antennomeres reddish. Aedeagus as in fig. 2060. Length 4.5–5.0 mm. Known only from Kyushu (Japan) ..... *japanus* CHŪJŌ, 1956.

Genus *Eumolpus* KUGELANN in ILLIGER, 1798

Almost 20 species, distributed in continental Eurasia. Some (two or three) species described from N America belong probably to the American genus *Eudoxia* KIRBY, 1837. In discussed area three species.

Key to species

1. Left mandibula long, reaching to right angle of labrum. Length 9.0–12.0 mm. Often considered as a subspecies of *E. chinensis* (thesis 2). Distributed in E Kazakhstan, Mongolia, Transbaicalia and N China ..... *goniostoma* (WEISE, 1889).  
–. Left mandibula normal, short, reaching to the middle of labrum ..... 2.
2. Body larger, lateral sides of pronotum more strongly rounded. Length 10.5–14.0 mm. Distributed in E Siberia, N China, Korea and Japan (Honshu, Kyushu) ....  
..... *chinensis* (BALY, 1859).  
–. Body smaller, lateral sides of pronotum more feebly rounded. General view as in plate LVIII, phot. 521. Length 8.0–10.5 mm (= *praetiosus* SCHNEIDER, 1791). Variation: Head and pronotum green, elytra blue (ab. *bicolor* FLEISCHER, 1910). Distributed in France, northern Italy, southern Germany, eastern Poland, basins of Danube, Dnepr and Volga, in Caucasian countries and Central Asia to Mongolia and Transbaicalia. Records from N China might refer to *chinensis* (thesis 2) ....  
..... *asclepiadeus* PALLAS, 1776.

Genus *Platycorynus* CHEVROLAT, 1837

A large genus, containing about 115 species distributed in Palaeotropical superregion, mainly in Oriental region. In discussed area three species.

Key to species

1. Frons between eyes with two cavities. Preapical antennomeres nearly 2 × longer than broad. Pronotum blue with purplish reflex, elytron shiny black, along lateral margins tinged with blue or purplish. Length of body 9.4–10.0 mm. Female unknown. Described from China (Sichuan, Kansu) ..... *grahami* GRESSIT et KIMOTO, 1961.  
–. Frons between eyes without distinct cavities ..... 2.
2. Pronotum reddish cupreous, covered by irregular and not very dense puncturation of two sizes. Elytra golden green, with suture and external margins violaceous.

- General view as in plate LVIII, **phot. 522**. Length 7.0–9.5 mm. Distributed mainly in Vietnam and S China, reported also from Korea ..... **parryi** BALY, 1864.
- . Pronotum green or blue. Elytron reddish cupreous with lateral margins green. Punctuation of elytra fairly fine, arranged in irregular rows. Length about 10.0 mm. Distributed in S China (Yunnan, Kweichow, Sichuan), reported also from Kansu ..... **purpureipennis** (PIC, 1928).

### Tribe *Nodinini*

Contains over 100 genera. The majority of them distributed in Palaeotropical area, a few genera also in Holarctis and Australia. In discussed area nine genera.

#### Key to genera

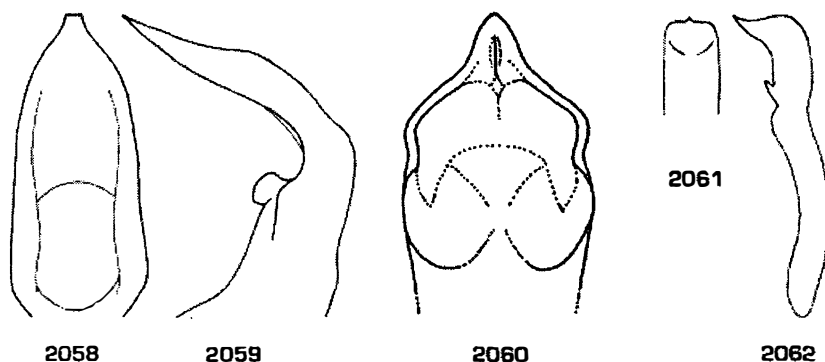
1. Claws simple or very shortly and shallowly split ..... **Chloropterus** (p. 416).
- . Claws distinctly bifid or appendiculate ..... **2**.
2. Claws bifid ..... **Cleoporus** (p. 418).
- . Claws appendiculate ..... **3**.
3. Pronotum as broad as elytra. Body very small (about 2.0 mm) and rounded, antennae shorter than 1/2 of body ..... **Nodina** (p. 419).
- . Pronotum narrower than elytra at base. Body usually larger ..... **4**.
4. Humeral angles rounded, body ovate ..... **Mireditha** (p. 419).
- . Humeral angles prominent ..... **5**.
5. Above eye run a distinct, deep groove. Length of body under 2.5 mm ..... **Pagria** (p. 419).
- . Head without groove above eye ..... **6**.
6. Fore legs much longer than mid or hind legs, fore femora very thick. Length about 7.0–8.0 mm, one species from Tibet ..... **Chrysonopa** (p. 418).
- . Fore legs normal ..... **7**.
7. Body rather subparallel, pronotum broadest in the anterior half, never laterally angulated. Forms from Caucasian countries and Transcaspia ..... **8**.
- . Body more stout, pronotum broadest in the basal part, sometimes in midlength, often laterally angulated. E Palearctic and Oriental forms .... **Basilepta** (p. 412).
8. Punctuation of elytra fine or moderately strong, intervals flat. Upper side brownish, in one species black with metallic reflex ..... **Bedelia** (p. 415).
- . Punctuation of elytra strong, inner intervals flat, outer distinctly convex, upper side black with metallic reflex ..... **Weiselina** (p. 420).

### Genus *Basilepta* BALY, 1860A

A large genus, containing about 260 species distributed in Oriental and partly also in E Palearctic area, from W India, NW China, Mongolia and E Siberia to Indonesia and New Guinea. In discussed area 11 species.

Key to species

1. Pronotum covered by adpressed, fine, not always well-visible hairs. Upper side black. Antenna reddish brown with apical segments darkened, legs entirely pale reddish brown. Length 3.2–3.9 mm. Endemic to Japan (Honshu, Shikoku, Kyushu) ..... ***hirticollis*** (BALY, 1874).
  - Pronotum glabrous ..... **2.**
2. Elytra subcostate at side, heavily punctured and covered by short fine hairs. Upper side golden or greenish bronzy. Legs pale. Length 4.0–4.5 mm. Described from Tibet ..... ***latericosta*** GRESSIT et KIMOTO, 1961.
  - Elytra glabrous ..... **3.**
3. Pronotum broadest before midlength, its lateral sides rounded. Body dark aeneous, with feeble greenish metallic reflex, antennomeres 1–3 pale reddish, tibiae and tarsi darker reddish brown. Length about 3.0 mm (= *puncticollis* WEISE, 1889 nec LEFÈVRE, 1889). Described from N China (Kansu) ..... ***subpunctata*** ACHARD, 1914.
  - Pronotum broadest in midlength or in hind part ..... **4.**
4. Lateral sides of pronotum rounded or forming a rounded angle behind middle ... **5.**
  - Lateral sides of pronotum forming an distinct angle ..... **6.**
5. Lateral sides of pronotum rounded. Underside, head and pronotum piceous, elytra yellowish testaceous; head, pronotum and lateral borders of elytra with greenish metallic reflex. Legs pale. Length 2.4–3.2 mm (= *maebarai* CHŪJŌ, 1956). Variation: body almost uniformly reddish brown, legs pale (unnamed). Distributed in S China and Japan (Shikoku, Kyushu) ..... ***varicolor*** (JACOBY, 1885).
  - Lateral sides of pronotum forming a rounded angle in hind part. Body entirely yellowish brown or testaceous. Aedeagus as in figs **2063**, **2064**, General view as in plate LVII, **phot. 512**. Length 3.3–3.9 mm (= *laeviuscula* WEISE, 1910). Distributed in S China and Japan (Honshu, Shikoku, Kyushu) ..... ***pallidula*** (BALY, 1874).
6. Metasternum distinctly punctured ..... **7.**
  - Metasternum impunctate or very indistinctly punctured ..... **9.**



Figs 2058-2062 (2058, 2059 after LOPATIN 1977; 2060 after KIMOTO and TAKIZAWA 1994; 2061, 2062 after MEDVEDEV 2005): 2058, 2059 – *Trichochrysea occidentalis*; 2060 – *Colaspoides japonus*; 2061, 2062 – *Weigelia fritzlari*.

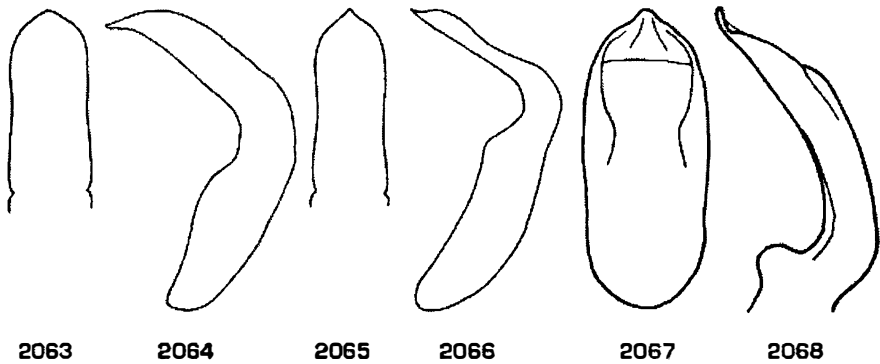
7. Lateral angle of pronotum situated approximately in its midlength ..... 8.
- Lateral angle of pronotum situated very near hind angles (about 1/5 of pronotal length), sides between lateral and anterior angle convergending anteriorly, very feebly arched or almost straight. Legs usually entirely pale, yellowish to pale reddish brown, very rarely pitchy; antennae bicolorous: antennomeres 1–4 pale, 5th blackened on apex, 6–11 black. Colouring of upper side variable, but usually pronotum and elytra differently coloured. General view as in plate LVII, **phot. 512**. Length 3.0–4.5 mm (= *chinense*, LEFÈVRE, 1877, *coerulescens* WEISE, 1889). Variations: pronotum and elytra similarly coloured, metallic blue or green (typical form), as typical form, but antennae and legs almost entirely blackish (ab. *atrripes* MOTSCHULSKY, 1860a), as typical form, but femora on apex blackish (ab. *bicoloripes* PIC, 1930 = *guerryi* PIC, 1930), head, pronotum and usually scutellum reddish, elytra metallic green or blue-green (ab. *aeneipennis* MOTSCHULSKY, 1860), pronotum black or pitchy black, elytra metallic green or blue (ab. *picicollis* WEISE, 1889), body almost uniformly reddish brown (ab. *rufotestacea* MOTSCHULSKY, 1860). Distributed in almost all China from Sinkiang to Yunnan, E Siberia, Mongolia, Korea, Taiwan and Japan (Hokkaido, Honshu, Shikoku, Kyushu) ..... ***fulvipes*** (MOTSCHULSKY, 1860).
8. Body and legs entirely bluish black, except antennomeres 2 and 3 being reddish. Length about 4.4 mm. Described from S China, reported also from Taiwan and Japan (Kyushu) ..... ***modesta*** (JACOBY, 1885).
- Colouring of upper side variable, usually uniformly reddish brown, but in some cases blackish in various degrees. Antenna reddish brown with 5 or 6 apical antennomeres blackish. General view as in plate LVII, **phot. 513**. Length 3.8–4.9 mm (= *japonica* JACOBY, 1885, *otsukae* OTSUKA, 1911, *yezo* NAKANE, 1963). Forms two subspecies: on elytra rows of punctures in apical part very shallow or almost disappearing (nominotypical subspecies = *yezo* NAKANE, 1963), on elytra rows of punctures well-developed to apex (subsp. *kurilensis* MEDVEDEV, 1966 from Kuril Is.). Distributed in Japan (Hokkaido, Honshu, Shikoku, Kyushu), subsp. in Kuril Is. ....  
..... ***balyi*** (HAROLD, 1877).
9. Upper side yellowish or testaceous ..... 10.
- Body black, pronotum dark red. Vertex strongly and densely punctured, interstices as broad or narrower than diameter of points. Length 4.2–5.0 mm (= *nigripennis* PIC, 1928). Variations: pronotum pitchy black (ab. *melanicollis* CHŪJŌ, 1956), head red, pronotum and elytra black (ab. *kuromune* NAKANE, 1963). Distributed in China (Sichuan, Szechuan), Taiwan and Japan (Honshu, Kyushu) .....  
..... ***ruficollis*** (JACOBY, 1885).
10. Lateral angle of pronotum more rounded, situated before base at 1/4–1/3 of pronotal length. Variation: a great part of pronotum and inner half of elytra bronzy greenish (ab. *sellata* WEISE, 1922). Length about 3.0 mm. Distributed in SE China from Fukien to Shantung ..... ***sinarum*** WEISE, 1922.
- Lateral angle of pronotum rather sharp, situated at 1/5 of pronotal length. Length 2.5–3.5 mm. Aedeagus as in figs **2065, 2066**. Distributed in Taiwan and Japan (Ryukyu Is., Kyushu) ..... ***hirayamai*** (CHŪJŌ, 1935).



Six species distributed in W Asia from Asia Minor to Sinkiang.

Key to species

1. Upper side metallic greenish-blue, on pronotum often with bronzy reflex. Legs and at least basal half of antennae rusty-yellow. Aedeagus not studied. General view as in plate LVIII, **phot. 514**. Length 2.8–4.0 mm. Distributed in Tadzhikistan and Kirgisia ..... *viridicoerulea* REITTER, 1901.
- Upper side rusty-yellow to reddish brown, sometimes with a weak metallic, greenish reflex ..... 2.
2. Pronotum transverse, about 2 × broader than long ..... 3.
- Pronotum about 1.3–1.5 × broader than long ..... 5.



Figs 2063–2068 (2063–2066 after KIMOTO and TAKIZAWA 1994; 2067, 2068 after LOPATIN 1977): 2063, 2064 – *Basilepta pallidula*; 2065, 2066 – *B. hirayami*, 2067, 2068 – *Chloropterus lefeurei*.

3. Upper side dark reddish brown to pitchy brown, with weak but distinct metallic reflex. Head distinctly and rather deeply punctured, punctures slightly elongate. Pronotum strongly and deeply punctured, interstices convex, smooth. Aedeagus not studied. General view as in plate LVIII, **phot. 515**. Length 2.9–4.0 mm. Described from Transcaspia ..... *kokanica* (SOLSKY, 1882).
- Upper side yellowish brown without metallic reflex ..... 4.
4. Frons near eyes strongly, vertex finely punctate. Pronotum in mid part very finely, along sides more strongly punctate. Aedeagus not studied. Length 3.0–3.8 mm. Described from NW China ..... *kaszabi* LOPATIN, 1962.
- Head almost impunctate, pronotum loosely and finely punctate. Aedeagus not studied. Length 3.0–4.0 mm. Described from NW China ..... *kaschgarica* LOPATIN, 1962.
5. Pronotum moderately strongly and not very densely punctate, interstices flat, reticulate. Body entirely rust-yellow, sometimes pronotum, metasternum and

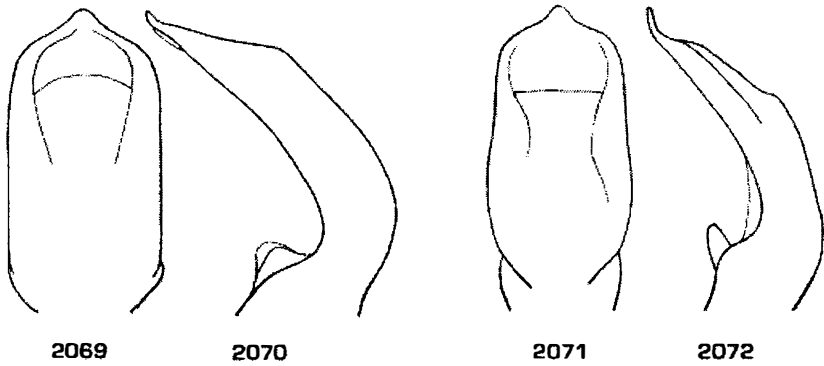
- abdomen blackish, legs always yellow. Variations: pronotum with two blurred blackish spots (unnamed), pronotum entirely or almost entirely (with anterior margin reddish) black, sometimes with feeble bronzy metallic reflex (unnamed). Aedeagus not studied. General view as in plate LVIII, **phot. 516**. Length 2.8–4.0 mm. Distributed in Central Asia, Caucasian countries and in Asia Minor ..... *angustata* LEFÈVRE, 1875.
- . Pronotum very densely, deeply and strongly punctured, interstices convex. Aedeagus not studied. Length 2.8–3.5 mm. Described from Iran, distributed also in Transcaspia ..... *insignis* LEFÈVRE, 1875.

### Genus *Chloropterus* MORAWITZ, 1861

#### Key to species

1. Species from North-West Africa. Eyes great. Frons narrow, its breadth distinctly smaller ( $2 \times$  in male,  $1.5 \times$  in female) than length of eyes ..... **2**
- . Species from South-East Europa, Caucasian countries and Asia. Eyes normal. Frons broad, its breadth between eyes as great or greater than length of eyes ..... **4**
2. Body yellow or pale testaceous, elytra without dark pattern. Pronotum with two little blackish spots. Length about 4.0 mm. Probably a light form of *bimaculatus* (thesis 3). Occurs in Algerian Sahara ..... *pallidus* CHABAUT, 1898.
- . Elytra with black pattern ..... **3**
3. Pronotum rust-yellow, with two horseshoe-like black spots. Elytra yellow, each with a great, a little blurred, dark brown spot. Length 4.0–5.0 mm. Described from Algeria. Variation: head and pronotum covered by minute, not very distinct hairs, general colouring somewhat darker, sometimes similar as in *stigmaticollis* (antithesis 3); described as a distinct species *forii* RUFFO, 1965 from Libya, possibly a local form ..... *bimaculatus* RAFFRAY, 1873.
- . Colouration of body generally as in *bimaculatus*, but on average darker. General view as in plate LVIII, **phot. 517**. Spots on elytra black, underside partly dark brown. Length 4.0–5.0 mm. Variation: black spots on elytra extended and partly joined (ab. *normandi* PIC, 1901). Probably a darker form of *bimaculatus* (thesis 3). Described from Tunisia ..... *stigmaticollis* FAIRMAIRE, 1875.
4. Pronotum at least laterally covered with semi-adpressed hairs (= *nigrofasciatus* REITTER, 1897). Aedeagus as in figs **2067**, **2068**. Length 4.5–6.0 mm. Distributed in Transcaspia and in Caucasian countries ..... *lefevrei* REITTER, 1890.
- . Pronotum hairless ..... **5**
5. Pronotum distinctly narrower than elytra, with two pairs of black spots. Elytra with black sutural stripe, black spot on humeral callus and with variously formed black pattern on the disc. General view as in plate LVIII, **phot. 518**. Length 5.5–5.7 mm. Described from Iran, reported also from Iraq ..... *ornatus* LOPATIN, 1984.
- . Pronotum as broad as elytra or indistinctly narrower. Elytra without distinct black pattern, usually pale or with brownish-grey or rusty-reddish, blurred pattern, rarely blackish (see also thesis 8) ..... **6**

6. Length of body 5.5–6.0 mm. On elytra rows of primary punctures distinct also in apical part. Aedeagus as in figs 2069, 2070. Distributed in Turkmenistan, Kazakhstan, Tadjhikistan and Mongolia ..... **grandis** WEISE, 1889.  
 -. Length of body at most 4.5 mm ..... 7.



Figs 2069-2072 (after LOPATIN 1977): 2069, 2070 – *Chloropterus grandis*; 2071, 2072 – *C. versicolor*.

7. Claws with incision or almost bifid ..... 9.  
 -. Claws simple ..... 8.



Figs 2073, 2074 (after LOPATIN 1977): 2073, 2074 – *Chloropterus unguiculatus*. Fig 2075 (after GRESSIT and KIMOTO 1961): *Cleoporus variabilis*, general view.

8. Underside black. Pronotum strong and less densely punctured. Pronotum entirely or for the most part black, elytra yellow, irregularly blackish margined.

- Length about 4.5 mm. Variations: elytra yellow with rust-reddish margins, pronotum rust-reddish (ab. *pallidicolor* PIC, 1910), elytra blackish with variable reddish margin (ab. *sublimbatus* PIC, 1910), pronotum almost entirely reddish (ab. *rufithorax* PIC, 1909), upper side black, on elytra reddish subhumeral and apical, not always distinct spots (ab. *obscuricolor* PIC, 1910). Perhaps a geographic form of *versicolor* (antithesis 8). Described from Romania ..... ***moldaviensis*** PIC, 1909.
- . Underside at least partly testaceous or rust-reddish. Pronotum modeartely strong and rather densely punctured. Upper side reddish brown or dark yellow, on pronotum two black spots, on elytra often a brown sutural stripe. Aedeagus as in figs **2071, 2072**, Length 3.2–4.5 mm. Variation: pronotum without black spots (ab. *immaculatus* PIC, 1909). Distributed in southern Russia, Caucasian countries and in Transcaspia ..... ***versicolor*** (MORAWITZ, 1860).
9. Claws at base with a shallow incision. Puncturation of pronotum shallow, in the middle of disc punctures smaller than interstices. Upper side rusty-yellowish, underside dark brown. In some specimens sutural margin of elytra darkened, on pronotum two brownish spots. Aedeagus as in figs **2073, 2074**. Length 3.0–3.5 mm. Described from Tadjikistan ..... ***unguiculatus*** LOPATIN, 1965.
- . Claws almost bifid. Body pale, brownish, antennae and legs yellowish, slightly darkened at knies. Similar to *bimaculatus* (thesis 3), but more shining. Length 4.2 mm. Described from Iran, based on one female only ..... ***politus*** BERTI et RAPILLY, 1973.

#### Genus *Chrysonopa* JACOBY, 1908

Genus *Chrysonopa* contains 5 species, distributed in SE Asia. In discussed area one species only. Body reddish castaneous, antennae and tarsi paler, mesosternum and metasternum darkened. General outline rather elongate, sides of elytra subparallel, pronotum subglobulous. Upper side glabrous. Fore femora in both sexes 2 × thicker than in remaining legs. Length 6.5–6.8 mm. Described from Tibet ..... ***tibetana*** GRESSIT et KIMOTO, 1961.

#### Genus *Cleoporus* LEFÈVRE, 1884

In the genus *Cleoporus* are included 14 species belonging to Oriental fauna. One species is also broadly distributed in E Palearctic area. Very variable in coloration, particularly on elytra. General ground colour from pale brown to dark reddish brown, sometimes elytra or even whole upper side entirely black. In the most common forms body is reddish brown, elytra blackish with apex and humeral area paler, or red-brown with suture, lateral margins and a longitudinal patch on disc black. Head smooth, puncturation of pronotum variable, primary punctures on elytra strong, arranged in regular rows, intervals slightly convex. General view as in fig. **2075**. Length 2.7–3.5 mm (= *robustus* BALY, 1874, *tibialis* LEFÈVRE, 1885, *pallidipes* FAIRMAIRE, 1888, *rufipes* LEFÈVRE, 1889, *niger* WEISE, 1922, *pygmaeus* WEISE, 1922, *aeneipennis* CHEN, 1935). Distributed in E Siberia, Korea, China, Indochina, Taiwan and Japan ..... ***variabilis*** (BALY, 1874).

Genus *Mireditha* REITTER, 1912

The genus *Mireditha* comprises two species.

Key to species

1. Head and pronotum rusty-brown, elytra Pronotum rather strongly punctate with a narrow median impunctate area. Elytron grey-brown with 4 black spots and with finely punctured intervals. Length 3.0–3.5 mm. Distributed in N China (Kansu) and Mongolia ..... **ovulum** (WEISE, 1889).
- . General colour shining black. Pronotum without a narrow median impunctate area. Elytron without 4 black spots and with impunctate intervals. Length 2.8–3.0 mm. Described from N China (Shansi) ..... **nigra** CHEN, 1940.

Genus *Nodina* MOTSCHULSKY, 1858

Genus *Nodina* comprises about 35 species distributed in Oriental area, mostly in Indonesia and E India. One species occurs also in Japan. In female elytron with two pairs of long ridges and a pair of short ones between the long ridges. Body bronzy black, legs and antenna reddish brown, 3 or 4 apical antennomeres darkened. Length 1.8–2.5 mm. Variations: body paler, entirely reddish yellow (ab. *rufofulva* CHŪJŌ, 1951), body dark, with bronzy metallic reflex (ab. *ao* NAKANE, 1963). Distributed in S China, Taiwan and Japan (Ryukyu Is., Honshu, Shikoku, Kyushu) ..... **chalcosoma** BALY, 1874.

Genus *Pagria* LEFÈVRE, 1884

Genus *Pagria* contains about 20 species distributed in Palaeotropical area, mainly in Indonesia, a few species are described also from S Africa. In discussed area one species. Underside almost always dark, black or pitchy, legs pale. Colouring of upper side very variable. Pronotum without pattern, yellowish, reddish, brown or black. Elytra usually pale, yellowish, testaceous or reddish brown, often with suture, margins and subbasal area darkened. Sometimes whole upper side piceous or black. General view as in plate LVIII, **phot. 519**. Length 1.8–2.4 mm (= *consimilis* BALY, 1874, *flavopustulata* BALY, 1874). Variations: general coloration pale, elytral suture darkened (ab. *anceyi* PIC, 1929), pronotum reddish, elytra testaceous, sutural stripe and a spot in basal part dark with metallic reflex (ab. *rufithorax* PIC, 1929), pronotum pitchy or black, elytra pale testaceous (ab. *bicolor* WEISE, 1922), pronotum pitchy or black, elytra pale testaceous with suture and lateral margins (partly) blackish (ab. *innotata* PIC, 1929), upper side entirely blackish or black (ab. *ussuriensis* ROUBAL, 1929). Widely distributed in Oriental area and E Asia from India, Indonesia and Micronesia to E Siberia, Korea nad Japan ....  
..... **signata** (MOTSCHULSKY, 1858).

Genus *Weiselina* REITTER, 1912

One species only. Body rather broad oval, a little flattened. Upper side dark green with metallic sheen, finely punctured. Underside and tarsi black with blue metallic reflex, antennae brown. Aedeagus not studied. Length about 3.5 mm. Described from Transcaucasia ..... *lenkorana* (REITTER, 1890).

## Subfamily *Chrysomelinae*

### Key to tribes

1. Elytral epipleuron situated rather vertically; ridge separating it from dorsal part of elytra flattened, broad, often blurred or transformed into a smooth convexity. Parameres of aedeagus fused dorsally. Body large (usually 8.0–18.0 mm) ..... ***Timarchini*** (p. 610).
- . Elytral epipleuron situated rather horizontally, sometimes even inflexed against underside, separated from dorsal part of elytra by a sharp edge or ridge. Parameres of aedeagus dorsally not fused ..... ***Chrysomelini*** (p. 421).

### Tribe *Chrysomelini*

The division into subtribes excluded.

### Key to genera

1. Terminal article of mandibular palpi considerably shorter and narrower than the previous. Here Nearctic species introduced from America, in XX Century distributed in Europe and Asia ..... **2**.
- . Terminal article of mandibular palpi not shorter and usually broader than the previous. Elytra differently coloured ..... **3**.
2. Elytra yellow with 10 longitudinal black stripes. Length 7.0–11.0 mm ..... ***Leptinotarsa*** (p. 570).
- . Elytra differently coloured ..... ***Zygomma*** (p. 609).
3. Tarsal claws appendiculate or bifid ..... **4**.
- . Tarsal claws simple ..... **7**.
4. Background of elytra dark brown or blackish, on each elytron eight (2, 2, 2) large, roundish yellow spots ..... ***Phola*** (p. 599).
- . Elytra differently coloured ..... **5**.
5. Tarsal claws bifid. Body large, stout, roundish ..... ***Paropsides*** (p. 595).
- . Tarsal claws appendiculate ..... **6**.
6. Tibiae angularly dilated at apex, tarsomere 3 entire ..... ***Gonioctena*** (p. 549).
- . Tibiae not angularly dilated at apex, tarsomere 3 bilobed ..... ***Phratora*** (p. 599).
7. Tibiae angularly dilated at apex, upper side reddish, on elytra longitudinal black stripes ..... ***Machomena*** (p. 571).
- . Tibiae not angularly dilated at apex ..... **8**.
8. Interior border of elytral epipleuron ciliate, at least partly ..... **9**.
- . Interior border of elytral epipleuron not ciliate ..... **16**.
9. Basis of pronotum on both sides emarginate and toothed. Body very convex, oval, humeral callus absent. W Mediterranean species ..... ***Cyrtonus*** (p. 533).
- . Basis of pronotum normal ..... **10**.
10. Labrum very short, with a deep incision in the middle. Mandibulae large, protruding. Body large, its length 9.0–14.0 mm ..... ***Gnathomela*** (p. 547).
- . Labrum normal, its central incision shallow. Mandibulae not protruding ..... **11**.

11. In hind legs tarsomere 3 covered by setae along external margins only, its lobes sharpened ..... **Crosita** (p. 526).
- In hind legs tarsomere 3 entirely covered by hairs, at most with very narrow, bare line along middle ..... **12**.
12. Intercoxal process of metasternum margined anteriorly ..... **13**.
- Intercoxal process of metasternum not margined anteriorly ..... **15**.
13. Metasternum as long as first abdominal segment or shorter. Body a little flattened and elongated, humeral calli distinct ..... **Oreina** (p. 572).
- Metasternum longer than first abdominal segment. Body more convex and stout, humeral calli often indistinct ..... **14**.
14. Legs thickened, fore tibia strongly curved, mid and hind tibia at apex toothlike broadened ..... **Cecchiniola** (p. 425).
- Legs normal ..... **Chrysolina** (p. 425).
15. Base of pronotum not margined ..... **Ambrostoma** (p. 423).
- Base of pronotum margined ..... **Humba** (p. 567).
16. Anterior coxal cavities open posteriorly ..... **17**.
- Anterior coxal cavities closed posteriorly ..... **34**.
17. Primary punctures of elytra arranged in regular rows at least along suture ..... **18**.
- Primary punctures of elytra arranged in irregular rows, confuse or random ..... **26**.
18. Body narrow and parallel-sided, weakly convex; pronotum narrower than elytra ..... **Prasocuris** (p. 603).
- Outline of body shorter and broader, oval, upper side convex ..... **20**.
19. Body outline oblong, elytra often with red lateral borders ..... **21**.
- Body outline oval ..... **21**.
20. Winged, pronotum transverse, somewhat flattened ..... **Hydrothassa** (p. 568).
- Wingless, pronotum longer, convex ..... **Oreothassa** (p. 595).
21. Marginal ridge of elytron does reach to about 1/3 length only, in hind part disappearing or replaced by a row of punctures ..... **Neophaedon** (p. 572).
- Marginal ridge of elytron reaching to apex or almost to apex ..... **22**.
22. Upper side without metallic sheen, entirely black or bicolorous (black and reddish or yellow). Species distributed in western part of the Mediterranean area ..... **Colaspidema** (p. 525).
- Upper side (somewhat except for apex of elytra) with metallic sheen, blue, blue-green or violaceous ..... **23**.
23. Third tarsomere shallowly emarginate. Punctures on elytra strong, not very dense, arranged in 9 distinct rows ..... **Sclerophaedon** (p. 604).
- Anterior part of elytron between humeral callus and scutellum without any impression ..... **24**.
24. Anterior part of elytron between humeral callus and scutellum with a impression. Pronotum narrower than base of elytra, its hind angles right ..... **Phaedon** (p. 596).
- Anterior part of elytron between humeral callus and scutellum without any impression. Pronotum as broad as base of elytra, its hind angles acute ..... **25**.
25. Puncturation of elytra arranged in 8 regular rows ..... **Sternoplatys** (p. 605).
- Puncturation of elytra arranged in regular rows along suture only ..... **Apteroicuris** (p. 425).
26. Base of pronotum not margined, tarsomere 3 entire ..... **27**.
- Base of pronotum not margined, tarsomere 3 bilobed ..... **28**.



27. Between clypeus and frons two more or less shallow, somewhat fused, transverse, furrow-like, deepenings ..... **Colaphus** (p. 523).
- Between clypeus and frons no transverse, furrow-like, deepenings, but a short and shallow longitudinal furrow ..... **Falsocolaphellus** (p. 545).
28. Apex of each tibia with tooth-like broadening ..... **Gastrophysa** (p. 545).
- Tibiae without broadening at apex ..... **29**.
29. Body strongly flattened. Mesosternum as long as the distance between fore coxae ..... **Gastrolina** (p. 545).
- Body convex, mesosternum shorter than the distance between fore coxae .... **30**.
30. Tibiae and whole upper side except head pale yellowish. Along lateral margin of elytron runs a narrow swelling or costa. Species from Japan ..... **Gastrolinoides** (p. 545).
- Not as above ..... **31**.
31. Epipleuron concave, its outer border sharp ..... **Plagioderia** (p. 602).
- Epipleuron flat ..... **32**.
32. Elytra very short and convex, almost hemispherical. General outline of body similar to *Timarcha*. Endemic to S Carpathians ..... **Timarchida** (p. 606).
- Elytra not particularly short and convex ..... **33**.
33. Pronotum flat, without lateral swelling. Tarsomere 3 shallowly emarginate. Metasternum unmarginated anteriorly ..... **Liniaeidea** (p. 570).
- Pronotum with lateral swelling, the swelling separated from central part of surface by a row of punctures or by a furrow. Tarsomere 3 deeply emarginate. Metasternum margined anteriorly ..... **Chrysomela** (p. 519).
34. Hind wings present ..... **35**.
- Hind wings almost entirely reduced or absent ..... **37**.
35. Upper side uniformly coloured, blackish with metallic reflex or brown without metallic reflex ..... **36**.
- Upper side yellowish or reddish, with black markings ..... **Entomoscelis** (p. 542).
36. Body entirely blackish, upper side with metallic reflex, species from E Asia ..... **Potaninia** (p. 602).
- Body brown, upper side without metallic reflex, species from Greece and Near East ..... **Cyrtanastes** (p. 528).
37. Elytron with 7 distinct rows of punctures ..... **Semenovia** (p. 605).
- Elytron with more than 7 rows of punctures or irregularly punctured ..... **38**.
38. Apices of mid and hind tibiae rounded, apical emargination surrounded by hairs ..... **Oreomela** (p. 582).
- Apices of mid and hind tibiae obliquely cut, more or less distinctly angulate, apical emargination surrounded by setae ..... **39**.
39. Outer apical angle of hind tibia obtusely rounded, external margin of hind tibia not emarginate ..... **Cystocnemis** (p. 541).
- Outer apical angle of hind tibia sharp, external margin of hind tibia more or less distinctly emarginate ..... **Xenomela** (p. 607).

Genus **Ambrostoma** MOTSCHULSKY, 1860

Literature: CHEN 1936.

Genus *Ambrostoma* contains twelve E Asiatic species, of these three or five (see remark to subgenus *Parambrostoma*) occur in the discussed area.

## Key to subgenera

1. Elytral epipleuron ciliated on whole length ..... **Ambrostoma** s. str. (p. 424).
- . Elytral epipleuron ciliated on apical 1/3 only ..... **Parambrostoma** (p. 424).

### Subgenus **Ambrostoma** s. str.

#### Key to species

1. Puncturation of elytra at least as strong as that of the sides of pronotum. On each elytron two transverse bands violaceous, surrounded by golden-green. Third band, oblique and less distinct, before apex. Length 9.0 mm. Described based on one specimen from China only ..... **rugosopunctatum** CHEN, 1934.
- . Puncturation of elytra much finer than that of the sides of pronotum ..... 2.
2. Elytra with two large violaceous spots surrounded by golden-green. Similar to *quadriimpressum* (antithesis 2), but purplish or violaceous patches on elytra disposed more transversely and lateral margins of pronotum almost straight. Length about 10.0 mm. Insufficiently studied species, known from N China (Shantung) only, perhaps a form of *quadriimpressum* ..... **fulgurans** ACHARD, 1922.
- . Pronotum without a large violaceous spots surrounded by green. Colouration of upper side metallic green with purplish or violaceous, irregular (on elytra mostly longitudinal) patches. General view as in plate LIX, **phot. 523**. On frons two small hollows. Anterior angles of pronotum obtuse, hind angles sharp. On each elytron two short simple rows of punctures (iuxtascutellar und scutellar), remaining primary punctures being arranged in 8 geminate rows and one simple (marginal) row. On each elytron also two small impressions in anterior 1/4. Underside more or less finely rugulose. Length 8.5–11.0 mm. Distributed in Mongolia, E Siberia, Korea and N China ..... **quadriimpressum** (MOTSCHULSKY, 1845).

### Subgenus **Parambrostoma** CHEN, 1936

Each of discussed species was described based on one, maybe erroneously labelled specimen from Korea; in opinion of some authors both species might be belonging to N Indian fauna.

#### Key to species

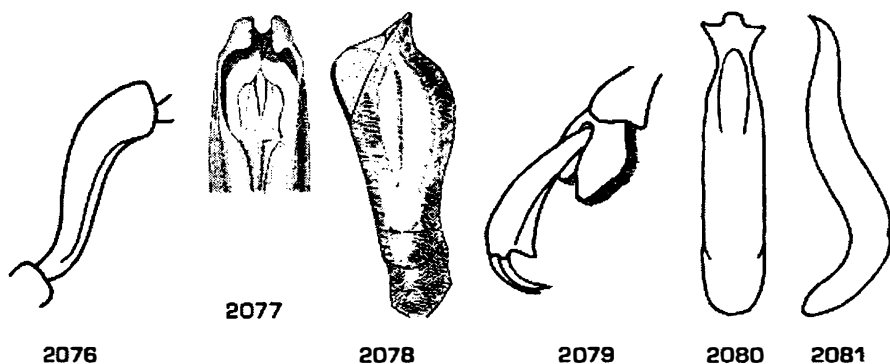
1. Pronotum strongly dilated before middle, its lateral longitudinal depression deep. Metasaternal process not bordered by a furrow. Body rather strongly gibbous. Upper side red purplish, green are: pronotum partly, on elytrabase, suture, lateral margins, transverse impressions and longitudinal, irregular spot behind middle on each. Punctures of elytra almost irregular. Length 9.0 mm. Described based on one specimen from ?Korea only ..... **sublaeve** CHEN, 1934.
- . Pronotum feebly dilated before middle, its lateral longitudinal depression shallow. Metasaternal process bordered by a furrow. Colouration of body similar as in *sublaeve*. Length 8.5 mm. Described based on one specimen from ?Korea only .....  
..... **ambiguum** CHEN, 1936.

Genus *Apterocuris* JACOBSON, 1900

Genus *Apterocuris* JACOBSON, by some authors considered as subgenus of *Sternoplatys* (p. 605), contains one species only. Dark greenish blue, sometimes with violaceous or cupreous hue. Antennae, apices of tibiae and tarsi dark grey-brown. Pronotum transverse, covered by strong, not very dense puncturation. Elytron without humeral calli, primary puncturation on disc arranged in 5 regular or almost regular rows, along lateral sides confused, at lateral margin a single regular row. General view as in plate LIX, **phot. 524**. Length 4.0–5.0 mm. Distributed in Kazakhstan and W Siberia ..... *sibirica* (GEBLER, 1830).

Genus *Cecchiniola* JACOBSON, 1908

Recently (catalogue of BIEŃKOWSKI 2001) considered as a subgenus of *Chrysolina*. One species only. Body pure black, three basal antennomeres partly reddish-brown. Humeral calli absent. Fore tibia bent (fig. 2076). Aedeagus as in figs 2077, 2078. General view as in plate LIX, **phot. 525**. Upper side finely, but densely and deeply punctate, feebly shining. Length 8–10 mm. Endemic to Crimea ..... *platyscelidina* (JACOBSON, 1898).



Figs 2076-2081 (2077, 2078 after BIEŃKOWSKI 2001, remaining after WARCHALOWSKI 2003): 2076-2078 – *Cecchiniola platyscelidina*: 2076 fore tibia, 2077, 2078 – aedeagus in dorsal and lateral view; 2079-2081 – *Chrysolina (Fastuolina) fastuosa*: 2079 – claw tarsomere; 2080, 2081 – aedeagus in dorsal and lateral view.

Genus *Chrysolina* MOTSCHOUJSKY, 1860

Literature: BECHYNÉ 1950, KIPPENBERG 1994, BIEŃKOWSKI 2001, 2008.

Not included in the key: *fortunata* (WOLLASTON, 1864), *rutilans* (WOLLASTON, 1864) and *wollastoni* BECHYNÉ, 1957), three unclear species described from Canary Islands.

Attempts to classify very numerous, often varied and mutually similar species have led to description of many subgenera and subspecies, thus making it impossible to clas-

sifythem according to clear dychotomic key. The determination key presented below is based principally on sculpture and colouration of upper side of body. It often allows only approximate determination, which must be each time confirmed with aedeagus sketch. Additionally, photograph showing full view of determined insect may be of help. The existing division into subgenera is of little use in the case of determination of *Chrysolina*, therefore subgeneric division and key to subgenera have been omitted. Similarly as in “*Chrysomelidae*” (WARCHAŁOWSKI 2003), auxiliary groups and keys to species are based on secondary characters only, while the catalogue (formal) subgeneric placement is given at each species name.

Key to auxiliary groups

1. Last tarsomere under basis of claws with a tooth (figs 2079) ..... auxiliary **group A** (p. 427).  
 - Last tarsomere under basis of claws without tooth ..... **2**.
2. Pronotum, tibiae and femora red, elytra, head and remaining parts of body black ..... auxiliary **group B** (p. 427).  
 - Body differently coloured ..... **3**.
3. Metallic reflex on elytra absent or barely perceptible. Elytra uniformly dark yellow, red brick or brownish red, sometimes punctures or/and suture blackish ....  
 ..... auxiliary **group C** (p. 427).  
 - Elytra either black (respectively black with metallic sheen) sometimes with red borders, or reddish brown with distinct metallic reflex ..... **4**.
4. Elytra black with yellow, reddish or red lateral borders .... auxiliary **group D** (p. 434).  
 - Elytra uniformly coloured ..... **5**.
5. On elytra primary punctures arranged in regular or semiregular rows, sometimes transformed into smooth, deep furrows ..... auxiliary **group E** (p. 447).  
 - On elytra primary punctures either randomly scattered or arranged in indistinct rows (sometimes stripes) ..... **6**.
6. Legs, antennae and palpi entirely brownish red, remaining parts of body deep black, or tarsi differently coloured than remaining parts of legs, or underside and legs reddish, reddish-brown or brown, often with feeble metallic reflex; in the last case upper side with cupreous, purplish or reddish-violaceous shine .....  
 ..... auxiliary **group F** (p. 486).  
 - Underside and legs black or black with metallic reflex ..... **7**.
7. Lateral borders of pronotum on whole or almost whole length swollen, anteriorly also elevate over the niveau of neighbouring surface of central part of disc ...  
 ..... auxiliary **group G** (p. 491).  
 - Lateral borders of pronotum at least in anterior 1/3 not swollen and not elevate over neighbouring surface of central part ..... **8**.
8. Pronotum trapezoidal, lateral sides straight or almost straight ..... auxiliary **group H** (p. 504).  
 - Pronotum not trapezoidal, lateral sides at least anteriorly rounded ..... **9**.
9. Lateral border of pronotum near hind angles separate from central part by a furrow or punctured impression ..... auxiliary **group I** (p. 507).  
 - Lateral border also posteriorly not separate from central part or separate only by a not impressed stripe of points ..... auxiliary **group J** (p. 513).

### Auxiliary group A

Last tarsomere with a tooth.

Here one species only (subgenus *Fastuolina*). Last tarsomere with a tooth (fig. 2079). General view as in plate LIX, **phot. 526**. Aedeagus as in figs 2080, 2081. Length 4.5–7.0 mm. Variations: background colour of elytra golden-cupreous, longitudinal stripes blue or greenish blue (ab. *galeopsidis* SCHRANK, 1798), background violaceous, stripes blue (ab. *jodasi* BECHYNÉ, 1950), upperside almost uniformly green (ab. *callichloris* BECHYNÉ, 1950), upper side uniformly cupreous, strongly shining (ab. *revyi* KASZAB, 1962), upper side matt, black, with bronzy or greenish metallic reflex (ab. *obscura* FLEISCHER, 1917). Forms 4 subspecies: length 5.0–7.0 mm, ratio breadth/length of pronotum more than 2 (nominotypical subspecies from the most part of Europe); body large, more stout, length sometimes 8.0 mm (subsp. *ventricosa* SUFFRIAN, 1858 from Italy and Iberian Peninsula); body smaller and more slender, length 5.0–6.5 mm, ratio breadth/length of pronotum less than 2. Puncturation of upper side stronger (subsp. *speciosa* LINNAEUS, 1767 from Fennoscandia); body larger (6.5–7.0 mm), tarsi more slender (?subsp. *andorrensis* BECHYNÉ, 1950 from Pyrenees). The form *inexplicabilis* BRANCSIK, 1910 (relatively large, uniformly dark violaceous), probably also a geographical race, occurs in NE Turkey. Distributed in almost whole Europe, Asia Minor and Caucasian countries ..... (*Fastuolina*) ***fastuosa*** (SCOPOLI, 1763).

### Auxiliary group B

Pronotum red, elytra black.

Here one species only. Pronotum, tibiae and femora red, elytra, head and remaining parts of body black. Prothorax relatively small. Entirely black form, often with red femora, were described as subsp. *pauliani* PEYERIMHOFF, 1939. Aedeagus as in figs 2082, 2083. Length about 10.5 mm. Described from Middle Atlas ..... (*Threnosoma*) ***mairei*** (PEYERIMHOFF, 1928).

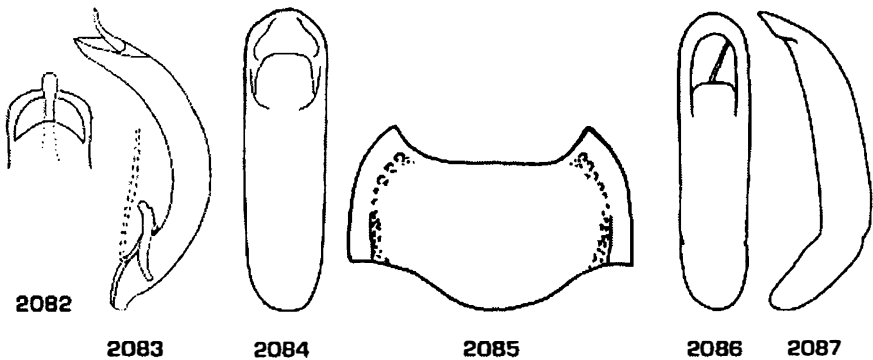
### Auxiliary group C

Elytra red without metallic reflex.

#### Key to species

1. Primary punctures arranged in geminate rows. Here immature specimens of *badakshanica* plate LX, **phot. 540**. See auxiliary group D, antithesis 42) and *discriminata* (auxiliary group E, antithesis 44).
- Primary punctures not arranged in geminate rows ..... **2.**
2. Primary punctures on elytra confused, very strong and sparse (about 50 punctures per elytron), each puncture forms a small hollow surrounded by black area. Ground colour of elytra pale reddish-testaceous to red brick. Pronotum black, almost impunc-

- tate. Aedeagus not studied. Length 9.0–10.5 mm. Distributed in Sicily, Calabria and Malta ..... (*Stichoptera*) **variolosa** (PETAGNA, 1819).
- . Primary punctures on elytra sometimes blackish, but never particularly strong and sparse ..... 3
  - 3. Upper side, legs and antennae red, on each elytron black lateral stripe running parallel to lateral side, on pronotum usually darkened area at basal margin before scutellum. Lateral *thickenings* of pronotum barely marked. Length 6.0–7.0 mm. Distributed in Kirghyzstan, SE Kazakhstan and NW China ..... (*Vittatochrysa*) **nigrovittata** (BALLION, 1878).
  - . Elytra without black stripe ..... 4
  - 4. Pronotum, underside and legs reddish ..... 5
  - . Pronotum and underside black or black with metallic sheen ..... 7

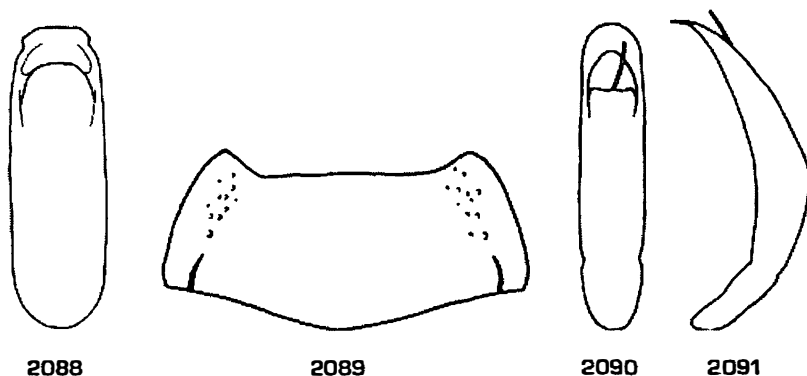


Figs 2082–2087. Aedeagus in dorsal and lateral view, pronotum (2082, 2083 after JOLIVET 1966, remaining after WARCHALOWSKI 2003): 2082, 2083 – *Chrysolina* (*Threnosoma*) *mairei*; 2084 – *Chrysolina* (*Colaphoptera*) *blanchei*; 2085–2087 – *Chrysolina* (*Chrysolina*) *staphylaea*.

- 5. Pronotum trapezoidal, anteriorly much narrower than at basis, lateral sides almost straight. Upper side red brown, without metallic reflex. Lateral impression on pronotum strongly punctate. Prosternum flat, without elevate transverse fold. General view as in plate LIX, **phot. 527**. Aedeagus as in fig. **2084**. Length 7.5–9.5 mm. Includes two subspecies: on pronotum lateral impression developed in whole length, covered by punctures relatively scarce and not confluent (nominotypical subspecies from Israel, Libanon, S Turkey and Cyprus), on pronotum lateral impression shortened, covered by strong, rugosely confluent punctures (subsp. *nilotica* BECHYNÉ, 1950 from Egypt). Distributed as above ..... (*Colaphoptera*) **blanchei** (FAIRMAIRE, 1865).
- . Pronotum not trapezoidal, lateral sides more or less rounded ..... 6
- 6. Lateral margins of pronotum strongly rounded (fig. **2085**), thickened, on whole length separate by a punctate impression. Elytra feebly shining, rather densely punctate, interstices 1–2 × broader than diameter of punctures. Prosternum with an elevate, transverse fold. General view as in plate LIX, **phot. 528**. Aedeagus as

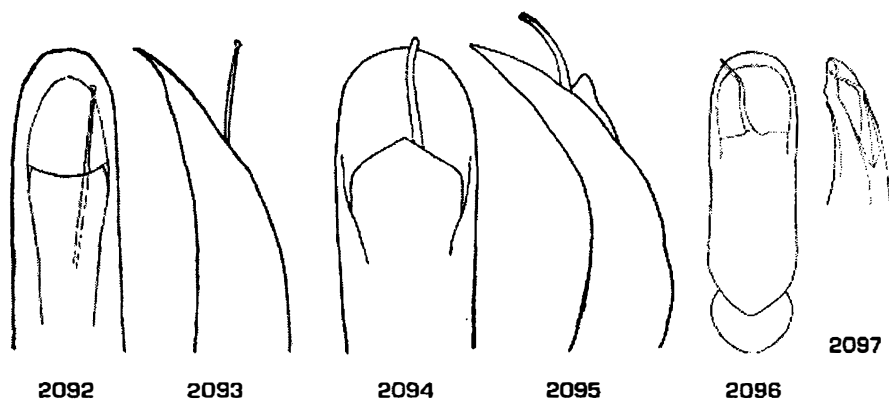
in figs **2086**, **2087**. Length 5.7–8.5 mm (= *cuprea* DEGEER, 1775, *rubrocuprea* GEOFFROY, 1785, *subferruginea* SUFFRIAN, 1851). Variation: metallic reflex strong (ab. *sharpi* FOWLER, 1890). In discussed area two subspecies: body more elongate and less convex in both sexes, surface shining. Punctuation of upper side more scarce (subsp. *arthritica* BECHYNÉ, 1950, a local race from Faeroe Islands), on elytra primary. Punctuation arranged in semiregular rows (subsp. *lederi* WEISE, 1878 from Caucasus). Widely distributed from Ireland and Island to Kamchatka .....  
 ..... (*Chrysolina* s. str.) ***staphylaea*** (LINNAEUS, 1758).

- Lateral margins of pronotum slightly rounded, very feebly thickened, not distinctly separate by a shallow impression. Elytra shining, rather scarcely, but much stronger than pronotum punctured, interstices on average about 3 × broader than diameter of punctures. Prosternum flat, without transverse elevat fold. Aedeagus as in fig. **2088**. Length 9.0–12.0 mm. Forms 3 subspecies: primary punctures on elytra shallow. Punctuation of pronotum dense, length 10.0–12 mm (nominotypical subspecies), primary punctures on elytra shallow, pronotum more scarcely punctured, length 9.0–11.0 mm (subsp. *winkleri* BREIT, 1919 from Libanon and Israel), primary punctures on elytra deep, length 10.0–12.0 mm (subsp. *pluscula* BECHYNÉ, 1950 from Mesopotamia and Iraq). Distributed in Near East: S Turkey (Hatay), Syria, Iraq, Libanon, Israel ..... (*Threnosoma*) ***anceyi*** (MARSEUL, 1868).
- 7. On elytra numerous small, roundish, shining, impunctate area. Here extreme forms of *exanthematica* subsp. *gemmifera* without blackish spots on elytra (auxiliary group G, thesis 1).
- Elytra without small shining areas ..... **8**.
- 8. Primary and secondary punctures on elytra of very similar size; in consequence elytral punctuation seems confused or here and there with traces of regular rows only. Here *carnifex* ab. *konowi* (see group D, thesis 20).
- Primary punctures on elytra much stronger than the secondary ..... **9**.
- 9. Elytral punctures arranged in regular, equidistant rows ..... **10**.
- Elytral punctures confused or with traces of puncture rows ..... **16**.



Figs 2088-2091. Aedeagus in dorsal and lateral view, pronotum (2088 after BREIT 1919, remaining after WARCHALOWSKI 1993): 2088 – *Chrysolina* (*Threnosoma*) *anceyi*; 2089-2091 – *C. (Taenioschista)* *reitteri*.

10. Species distributed in Europe, from W France to Caspian Sea ..... 11.  
 - Species from Asia ..... 12.
11. Intervals of elytra in male shining, in female sometimes semimatt. Elytra red brick, blackening of suture very narrow. Remaining parts of body black, often with very feeble metallic reflex. Outline of pronotum as in fig. 2089. Lateral borders of pronotum extremely finely punctulate. Aedeagus as in figs 2090, 2091. Length 4.7–6.0 mm (= *lurida* LINNAEUS, 1767, nec SCOPOLI, 1763, *striata* FOURCROY, 1785). About 12 subspecies are described, but their rank should be regarded as tentative, since many subspecies may turn out to be only local forms or their hybrids: intervals without secondary punctures (subsp. *bakuensis* BECHYNÉ, 1952, from eastern Caucasus), pronotum short (breadth/length > 3 or more), body short oval (nominotypical subspecies = *saxonica* SILFVERBERG, 1977, *sequana* SILFVERBERG, 1977, from France and Central Europe), pronotum short, secondary punctures on elytra particularly distinct (subsp. *nevesinjensis* BECHYNÉ, 1952, distributed in Bosnia), as preceding, but body oblong and secondary punctures normal (subsp. *jailensis* BECHYNÉ, 1952, from Crimea), pronotum longer (breadth/length < 3 or less), pronotum almost impunctate, suture often darkened (subsp. *lineata* PAPP, 1946, from basin of Danube), pronotum longer, body elongate, punctures of upper side very distinct (subsp. *mangaliana* BECHYNÉ, 1952, from eastern Bulgaria), pronotum longer, remaining characters as in *reitteri* s. str. (subsp. *pseudolurida* ROUBAL, 1917, from Asia Minor and western Caucasus), lateral borders of pronotum swollen on whole length, aedeagus broader than in remaining races (subsp. *obscurifaceta* BECHYNÉ, 1952, from Italy). Distributed in all mentioned areas, from western France to Caspian Sea ..... (*Taeniossticha*) ***reitteri*** (WEISE, 1884).
- Elytra in both sexes matt. Remaining characters barely different as in *reitteri* (thesis 11), in shape of aedeagus also no essential differences. Probably a local form or race of *reitteri*. Described from basin of Volga ..... (*Taeniossticha*) ***samarensis*** BECHYNÉ, 1950.

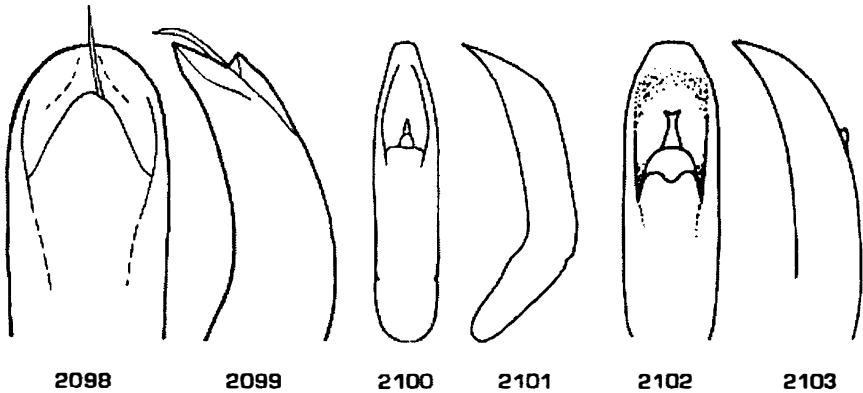


Figs 2092-2097 Aedeagus in dorsal and lateral view (2092, 2093 after BIENKOWSKI 2001, remaining after LOPATIN 1977): 2092, 2093 - *Chrysolina (Taeniossticha) imperfecta*, 2094, 2095 - *C. (T.) tianshanica*; 2096, 2097 - *C. (T.) kuldzhensis*.



12. Lateral thickenings of pronotum separated from disc by smooth, bent, deep furrow in basal part only. Pronotum transverse, about 2.2 × broader than long. Elytra relatively dark reddish brown with blurred reddish bordering. Aedeagus as in figs **2092**, **2093**. Length 6.0–7.5 mm. One subspecies was described: on average larger, lateral furrow on pronotum longer, humeral callus strongly developed (subsp. *plusquamperfecta* BECHYNĚ, 1952 from Afghanistan). Distributed in Iran, Afghanistan and Turmenistan ..... (*Taeniosticha*) ***imperfecta*** (BREIT, 1920).
- Lateral thickenings of pronotum separated from disc on whole length ..... **13**.
13. Intervals of puncture rows on elytra perceptibly convex ..... **14**.
- Intervals of puncture rows on elytra flat ..... **15**.
14. Intervals of puncture rows on elytra distinctly convex. Length 6.7–8.0 mm (= *dzhungarica* JACOBSON, 1910). Described from NW China (Dzhungaria) ..... (*Taeniosticha*) ***alatavica*** (JACOBSON, 1910).
- Intervals of puncture rows on elytra feebly convex. Lateral furrow on pronotum narrow, in the middle interrupted or shallow. General view as in plate LIX, **phot. 529**. Aedeagus as in figs **2094**, **2095**. Length 6.0–7.0 mm. Distributed in SE Kazakhstan and Kirghyzstan ..... (*Taeniosticha*) ***tianshanica*** (JACOBSON, 1910).
15. Lateral furrow on pronotum narrow, in the middle interrupted or shallow. Aedeagus as in figs **2096**, **2097**. Length 6.0–7.5 mm ..... (*Taeniosticha*) ***kuldzhensis*** LOPATIN, 1976.
- Lateral furrow on pronotum not interrupted. Aedeagus (figs **2098**, **2099**) as in *kuldzhensis* or *tianshanica*. (In my opinion, it is uncertain, *iftianshanica*, *kuldzensis* and *koktumensis* are really allospecific). Described from NW China (Dzhungarian Alatau Mountains) ..... (*Taeniosticha*) ***koktumensis*** LOPATIN et KULENOVA, 1987.
16. Body larger, elytral punctures random ..... **17**.
- Body smaller, elytral punctures not entirely random ..... **21**.
17. Pronotum with strong metallic sheen, its thickened lateral borders well-developed ..... **18**.
- Metallic reflex on pronotum feeble or absent, lateral borders not thickened, indistinct ..... **19**.
18. Thickened lateral border of pronotum broad, situated dorsally. Length 6.0–9.0 mm. Elytra red brick, remaining parts of body black with metallic reflex. Metallic sheen on pronotum usually strongly, green, golden green or cupreous. General view as in plate LIX, **phot. 530**. Aedeagus as in figs **2100**, **2101**. Length 6.0–9.0 mm. Variations: elytra black with feeble metallic reflex (ab. *sirgueyi* PORTA, 1934), elytra black without metallic reflex (ab. *kafkana* REITTER, 1898), elytra blackish with cupreous metallic reflex (ab. *menthae* SCHRANK, 1776), elytra black with feeble metallic reflex, epipleura red (ab. *epipleuralis* JACOBSON, 1895), elytra red, black parts of body without metallic reflex (ab. *vanderwieli* EVERTS, 1921). Very widely distributed from northern Spain, Ireland and southern Norway to Mongolia and China ..... (*Erythrochrysa*) ***polita*** (LINNAEUS, 1758).
- Lateral margins of pronotum evenly rounded, converging anteriorly, thickened lateral borders of pronotum narrow, situated laterally. Elytra red brick, remaining parts of body black with rather strong metallic sheen. General view as in plate LIX, **phot. 531**. Aedeagus as in figs **2102**, **2103**. Length 9.5–10.5 mm. Metallic sheen on pronotum blue, greenish blue or green. Variations: metallic sheen on pronotum blue or blue-violaceous (typical form), green or golden green (ab. *dulcinula* BECHYNĚ,

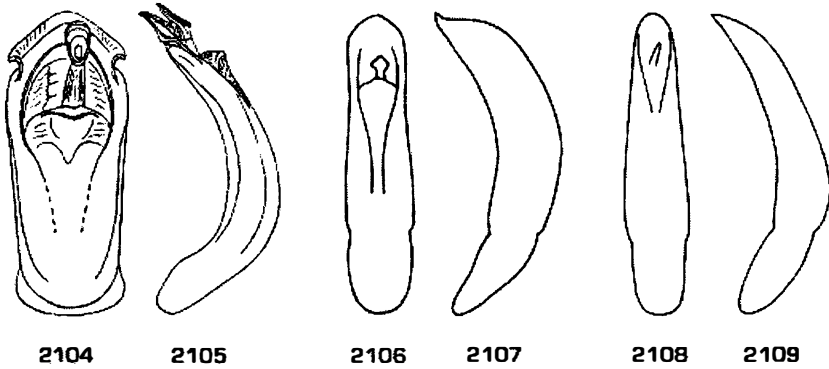
1950), elytra black, bordered with red (ab. *illita* WEISE, 1884). Three subspecies are described: thickened borders of pronotum narrower, elytra strongly punctate (subsp. *chloromaura* OLIVIER, 1807 from Portugal), pronotum reticulate, feebly shining (subsp. *tingitana* ESCALERA, 1914 from Morocco and S Spain), pronotum not reticulate, strongly shining (nominotypical subspecies from remaining area). Distributed in Mediterranean area from Morocco, Portugal and southern France to Bosnia and Greece ..... (*Melasomoptera*) ***grossa*** (FABRICIUS, 1792).



Figs 2098-2103. Aedeagus in dorsal and lateral view (2098, 2099 after BIENKOWSKI 2001, remaining after WARCHALOWSKI 1993): 2098, 2099 – *Chrysolina* (*Taeniosricha*) *koktumensis*; 2100, 2101 – *C. (Erythrochrysa)* *polita*; 2102, 2103 – *C. (Melasomoptera)* *grossa*.

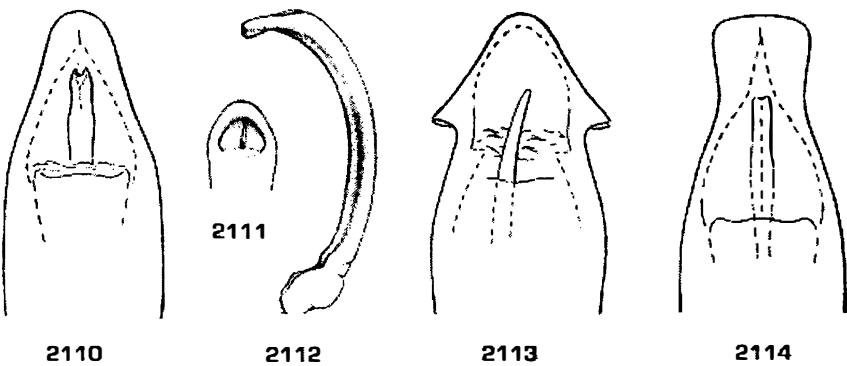
19. Species from Mediterranean area ..... **20.**  
 –. Species from Asia. Pronotum black with weak greenish reflex, feebly shining, covered by dense and fine puncturation, lateral furrows absent or developed as shallow traces only. Elytra covered by very dense, moderately strong and entirely random puncturation. Primary puncturation on sides partly confluent in short wrinkles. Secondary puncturation sparse, very fine, here and there perceptible on intersices of primary punctures. Aedeagus as in figs **2104**, **2105**. Length 8.0–9.0 mm (= *hemichlora* GERMAR, 1824, *rubra* MOTSCHULSKY, 1860). Distributed in Mongolia and in Siberia from Altai to Transbaikalia ..... (*Timarchoptera*) ***haemochlora*** (GEBLER, 1823).  
 20. Metallic reflex on pronotum feeble, but distinct, violaceous or dark bronzy. Aedeagus as in figs **2106**, **2107**. Length 8.0–11.0 mm. Variations: metallic reflex on pronotum violaceous (typical form) or greenish (ab. *laevipennis* SUFFRIAN, 1851). Distributed in Italy and in Adriatic area ..... (*Melasomoptera*) ***lutea*** (PETAGNA, 1819).  
 –. Pronotum pure black, without metallic reflex. Aedeagus as in figs **2108**, **2109**. Length 8.0–10.5 mm. Two subspecies are described: on average larger, punctures of elytra very fine (nominotypical subspecies from France and N Spain), on average smaller, punctures on elytra stronger, pronotum narrower (subsp. *torresi* BECHYNÉ, 1950 from S Spain). Third subspecies (subsp. *suaresi* COBOS, 1952 from Sierra Nevada) does not differ from *torresi*. Distributed in Iberian Peninsula and southern France ..... (*Melasomoptera*) ***lucida*** (OLIVIER, 1807).

21. Body slightly flattened, subparallel (see plate LX, **phot. 536**). Here some forms of *marginata* (group D, thesis 25).  
 -. Body strongly convex, short and rounded as in *numida* (see plate LX, **phot. 532**). Here belong five iberian and North-African species very similar to each other, unambiguously determinable only by shape of aedeagus ..... **22**.



Figs 2104-2109. Aedeagus in dorsal and lateral view (2104, 2105 after MIKHAILOV 2002; 2106, 2107 WARCZALOWSKI 1993; 2108, 2109 after BECHYNÉ 1950): 2104, 2105 – *Chrysolina (Timarchoptera) haemochlora*; 2106, 2107 – *C. (Melasomoptera) lutea*; 2108, 2109 – *C. (Melasomoptera) lucida*.

22. Iberian species. Punctures of elytra usually blackened. Aedeagus as in fig. **2110**. Distributed in Spain and Portugal ..... (*Palaeosticta*) ***diluta*** (GERMAR, 1824).  
 -. Non-European species ..... **23**.



Figs 2110-2114. Aedeagus or its apical part in dorsal and lateral view (211, 2112 after DACCORDI 1972, remaining after CODINA PADILLA 1961): 2110 – *Chrysolina (Palaeosticta) diluta*; 2111, 2112 – *C. (P.) ruffoi*; 2113 – *C. (P.) pardo*; 2114 – *C. (P.) kocheri*.

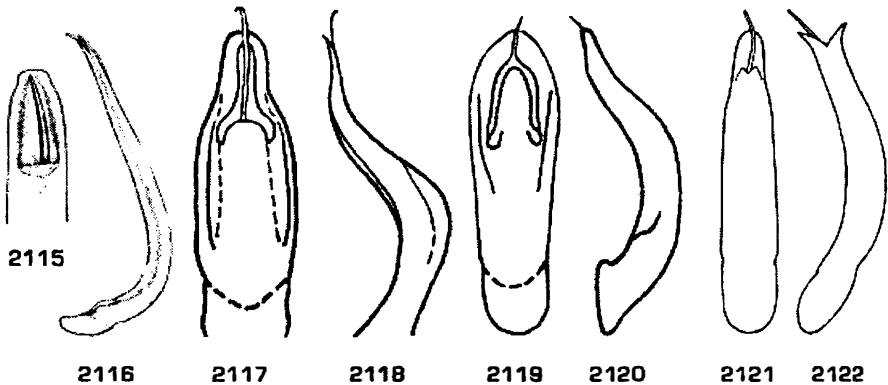
23. Species from Morocco and western part of Algeria ..... **24**.  
 –. Species from Libya and Israel. Length 7.6–8.6 mm. Forms two subspecies: aedeagus as in figs **2111**, **2112** (nominotypical subspecies described from Libya), aedeagus shorter and more strongly bent (subsp. *benjaminica* DACCORDI, 1972 from Israel, perhaps a distinct species) ..... (*Palaeosticta*) **ruffoi** (DACCORDI, 1972).
24. Apex of aedeagus arrow-like (fig. **2113**). Length 5.6–6.8 mm. Distributed in Morocco ..... (*Palaeosticta*) **pardoi** (CODINA PADILLA, 1961).  
 –. Apex of aedeagus not arrow-like ..... **25**.
25. Aedeagus narrowed before apical part (fig. **2114**). Length 5.8–7.0 mm. Distributed in Morocco ..... (*Palaeosticta*) **kocheri** (CODINA PADILLA, 1961).  
 –. Aedeagus not narrowed before apical part (figs **2115**, **2116**). General view as in plate LX, **phot. 532**. Length 5.9–7.2 mm. Distributed in Morocco and western Algeria ..... (*Palaeosticta*) **numida** (REICHE, 1864).

Auxiliary group D

Elytra black with reddish lateral borders.

Key to species

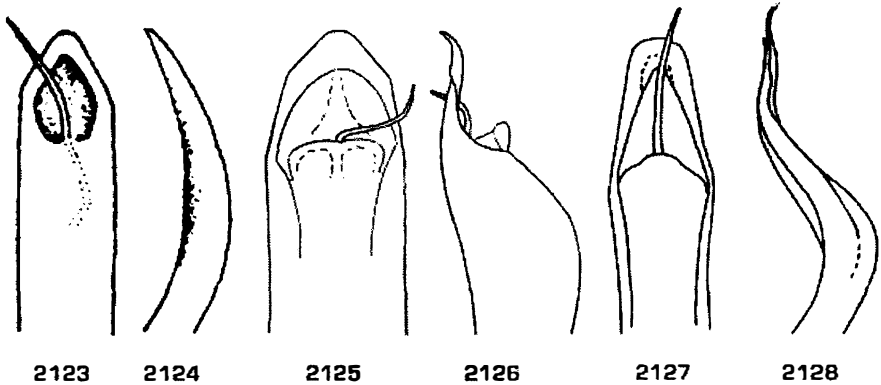
1. Lateral red stripe of elytra encroaches also on anterior border ..... **2**.  
 –. Lateral red stripe of elytra do not encroaches on anterior border ..... **11**.



Figs 2115-2122. Aedeagus in dorsal and lateral view (2115, 2116 after CODINA PADILLA 1961; 2117, 2118 after MEDVEDEV and OKHRIMENKO 1991; 2119, 2120 after LOPATIN 1977; 2121, 2122 after WARCHALOWSKI 2003): 2115, 2116 – *Chrysolina* (*Palaeosticta*) *numida*; 2117, 2118 – *C. (Chalcoidea)* *zamotailovi*; 2119, 2120 – *C. (Ch.) turgaica*; 2121, 2122 – *C. (Stichoptera)* *mactata*.

2. On elytra numerous small, roundish, shining, impunctate area. Here some forms of *exanthematica* subsp. *gemmifera* (auxiliary group G, thesis 1).  
 –. On elytra no small shining area ..... **3**.

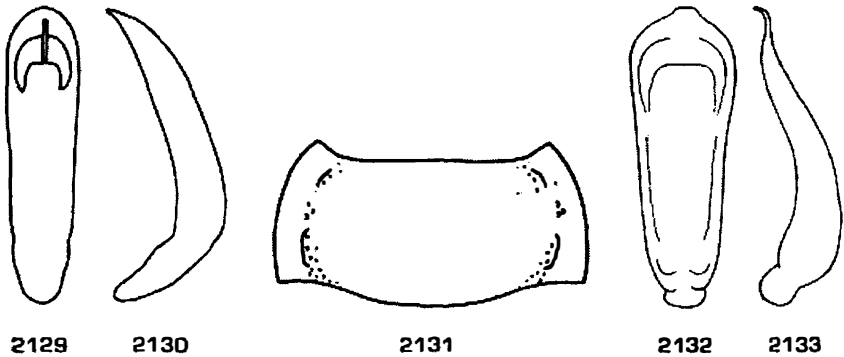
3. Upper side matt. Black with bluish reflex. Primary punctures arranged in somewhat confused rows. Pronotum not trapeziform, its lateral margins distinctly converging anteriorly in anterior half only. Lateral thickenings separated from disc in anterior part by strong punctures, in basal part by a shallow impression. Apex of aedeagus (figs 2117, 2118) narrowed. Length 6.0–7.9 mm. Described from W Caucasus ...  
 ..... (Chalcoidea) **zamotailovi** MEDVEDEV et OKHRIMENKO, 1990.
4. Upper side shining ..... 4.
4. Pronotum somewhat trapeziform, its lateral margins almost straight, lateral thickenings on whole length separated from disc. Primary punctures on elytra distinct, deep, arranged in regular rows. Apex of aedeagus (figs 2119, 2120) rounded, without lamella. Length about 6.0 mm. Described from W Kazakhstan .....  
 ..... (Chalcoidea) **turgaica** (JACOBSON, 1910).
5. Lateral margins of pronotum not almost straight, more or less rounded ..... 5.
5. Central part of pronotum shining, very scarcely and irregularly punctured. Elytra reddish-yellow with a very broad sutural stripe, reaching to the middle of breadth. General view as in plate LX, phot. 533. Aedeagus as in figs 2121, 2122. Length 6.0–7.0 mm. Variation: yellow lateral stripes narrow, sharply limited (ab. *insignis* BREIT, 1920, sometimes considered as subspecies, from Asturia). Distributed in Iberian Peninsula and S France ..... (Stichoptera) **mactata** (FAIRMAIRE, 1859).
6. Central part of pronotum finely, rather densely, uniformly punctured. Elytra black with anterior and lateral borders red ..... 6.



Figs 2123–2128. Apical half of aedeagus in dorsal and lateral view (2123, 2124 after KASAP 1988; 2125, 2126 after BIEŃKOWSKI 2001; 2027, 2028 after MEDVEDEV and OKHRIMENKO 1991): 2123, 2124 – *Chrysolina (incerti subg.) bruneli*; 2125, 2126 – *C. (Chalcoidea) cilissa*; 2127, 2128 – *C. (C.) sellata*.

6. Primary elytral punctures arranged in distinct rows. Length 6.0–7.0 mm (see also *dohrni*, thesis 39) ..... 7.
7. Primary elytral punctures almost randomly scattered, red borders sometimes enlarged, then the black colour forms in hind part a great, common roundish spot on red ground ..... 10.

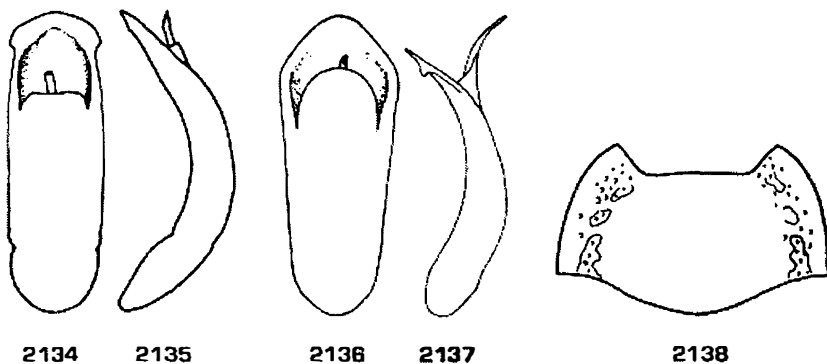
7. Elytra red, suture and a bluish black longitudinal stripe on each elytron bluish-black. Variations: median stripe blurred (ab. *nebulosa* DEMAISON, 1896), median stripe absent, elytra red with blackish suture only (ab. *concolor* DEMAISON, 1896). Aedeagus as in figs **2123**, **2124**. Length 6.0–7.0 mm. Distributed in Asia Minor ..... (incertisubgeneris) ***bruneli*** (DEMAISON, 1896).
- . Elytra red with a great, common, black, anteriorly and posteriorly excised spot. Here three externally similar species from Asia Minor, Caucasian countries and Mesopotamia ..... **8**.
8. Upper side more finely punctured, apex of aedeagus (figs **2117**, **2118**) very distinctly narrowed. Length about 6.5 mm, perhaps Caucasian subspecies of *sellata* (antithesis 9). Described from Caucasus. See *zamotailovi* (thesis 3).
- . Upper side more strongly punctured, apex of aedeagus gently narrowed .....
9. Apex of aedeagus as in figs **2125**, **2126**. Length about 6.5 mm. Described from Asia Minor (Taurus Mountains) ..... (*Chalcoidea*) ***cilissa*** (JACOBSON, 1924).
- . Apex of aedeagus as in figs **2127**, **2128**. Length about 6.5 mm. Distributed in Asia Minor and Mesopotamia ..... (*Chalcoidea*) ***sellata*** (WEISE, 1894).



Figs 2129-2133. Pronotum and aedeagus in dorsal and lateral view (2129-2131 after WARCHALOWSKI 2003; 2132, 2133 after BREIT 1920): 2129-2131 – *Chrysolina (Craspeda) limbata*; 2132, 2133 – *C. (C.) je-nisseiensis*.

10. Apical part of aedeagus in lateral view regularly bent, apical lamella not or very weakly marked. Outline of pronotum as in fig. **2131**. Metallic reflex on pronotum bronzy. Elytral punctures fine, confused, here and there arranged in indistinct rows. General view as in plate LX, **phot. 534**. Length 6.5–9.5 mm (= *besseri* KRYNICKI, 1832, *limbifera* KÜSTER, 1846). Variations: pronotum black with blue reflex, red borders broader (ab. *kavani* BECHYNÉ, 1950, described from Slovakia), pronotum pure black, body on average greater (ab. *findeli* SUFFRIAN, 1851 described from Alps), red borders very broad (ab. *discipennis* FALDERMANN, 1835, predominant in Asian part of area, regarded nowly as a subspecies). Two subspecies are described: subsp. *findeli* (SUFFRIAN, 1851) from Alps and subsp. *luigionii* DEPOLI, 1936 from Italy. Both are probably only local or individual variations. Distributed from Pyrenees, western France and southern Sweden to Siberia ..... (*Craspeda*) ***limbata*** (FABRICIUS, 1775).

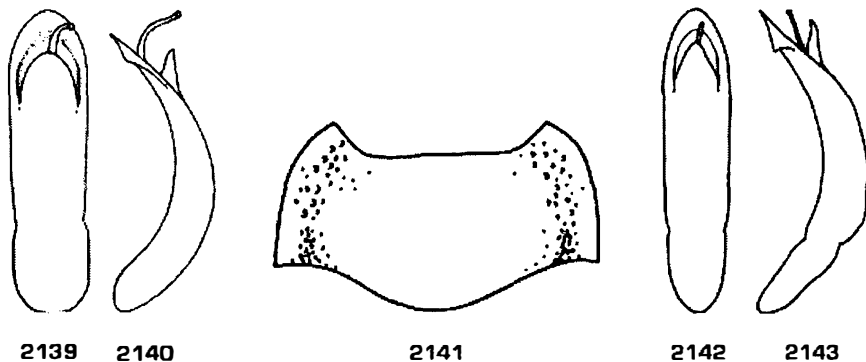
- Apical part of aedeagus (figs **2132**, **2133**) in lateral view wavy, apical lamella slightly or distinctly marked. External characters as in *limbata* (thesis 10), generally smaller and more slender. Length 4.8–6.5 mm. Distributed from S Russia and Caucasian countries to Mongolia and Yakutia ..... (*Craspeda*) ***jenisseiensis*** (BREIT, 1920).
- 11. Body large (8.5–12.5 mm, usually about 10.5–11.5 mm), very convex and stout, widened posteriorly. Upper side except the red margin of elytra black, often with feeble, dark blue metallic reflex. Wingless, humeral calli absent. Elytra confusedly, uniformly, rather strongly punctured, punctures of pronotum also uniform, but twice finer and much more dense. Prosternum flat. Aedeagus as in figs **2134**, **2135**. Variations: elytra without red border, metallic reflex violaceous (ab. *manicata* BECHYNÉ, 1950), elytra with red border, metallic reflex bronzy (ab. *redtenbacheri* BECHYNÉ, 1946), upper side unicolorous, black blue (ab. *hungarica* FUSS, 1861). Distributed in northern Italy, Balkans and basin of Danube ..... (*Threnosoma*) ***fimbrialis*** (KÜSTER, 1845).
- Body not conspicuously stout and convex, length mostly under 8.0 mm (larger, to 11.0 mm, in *gypsophilae* and *latecincta* only, theses 15 and 18 ..... **12**.
- 12. Last palpomere strongly widened (at least in male), its apex transversely cut ... **13**.
- Last palpomere formed normally, oval or subcylindrical ..... **19**.
- 13. Pronotum trapezoidal, anteriorly much narrower than at basis, lateral sides straight (figs **2147**). The form of aedeagus is within the variability range of that organ in *C. gypsophilae* (thesis 18). Perhaps a subspecies of *gypsophilae*. Distributed in Italy and in northern part of Adriatic area .... (*Stichoptera*) ***rossia*** (ILLIGER, 1802).
- Pronotum not trapezoidal, at least anteriorly rounded (fig. **1343**) ..... **14**.



Figs 2134-2138. Pronotum and aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1993): 2134, 2135 – *Chrysolina* (*Threnosoma*) *fimbrialis*; 2136-2138 – *C. (Stichoptera) latecincta*.

- 14. Hind wings shortened, humeral callus feebly developed, antennomeres 7–9 at most as long as broad, usually shorter; on elytra red border reaches third or fourth external row of punctures (see also *gypsophilae*, thesis 18) ..... **15**.
- Hind wings normally developed, antennomeres 7–9 at least as long as broad, usually longer; on elytra red border reaches second external row of punctures ..... **16**.

15. European species. Larger, aedeagus as in figs **2136**, **2137**. A boreoalpine species, including numerous local varieties ranked partly as subspecies differing in combination of secondary characters. Length 8.5–10.5 mm (= *norica* HOLDHAUS, 1914, *raetica* FRANZ, 1938 *hustachei* LABOISSIERE, 1939, *rufohumeralis* PIC, 1939, *holdhausi* FRANZ, 1949, *vallesiaca* FRANZ, 1949, *tarragonensis* BECHYNÉ, 1950, *laboissierei* BECHYNÉ, 1952). The most important forms: nominotypical subspecies from SE France, subsp. *decipiens* FRANZ, 1938 from Pyrenees, subsp. *graja* (FRANZ, 1938) from Alps, subsp. *helliensesi* SILFFERBERG, 1977 from Norway, subsp. *sierrana* FRANZ, 1958 from central Spain, subsp. *intermedia* (FRANZ, 1938) from The British Isles and ?Alps. Distributed in Fennoscandia, The British Isles, Alps and Pyrenees .....  
 ..... (Stichoptera) ***latecincta*** (DEMAISON, 1896).
- . E Siberian species. Smaller, apex of aedeagus regularly rounded, Pronotum large, barely narrower than elytra, its sides in basal 1/3 almost parallel. Thickened lateral borders separated from disc in basal 1/3 by a straight furrow, in anterior part by a moderately deep impression, in the middle by a shallow impression covered by large punctures. Large or strong punctures are situated along whole lateral callus. Ground of pronotum indistinctly reticulated. Humeral calli barely indicated, elytra moderately shining, indistinctly reticulated, rows of primary punctures strongly confuse, more regular are the juxtamarginal row and two external rows, all three situated on red ground. Length 6.8 mm. Described from Russian Far East .....  
 ..... (Stichoptera) ***pavlenkoi*** (JACOBSON, 1924).

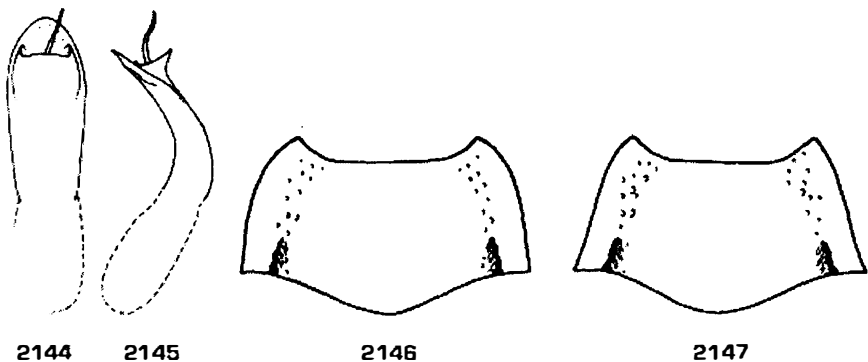


Figs 2139-2143. Pronotum and aedeagus in dorsal and lateral view (after WARCHALOWSKI 1993): 2139-2141 - *Chrysolina* (Stichoptera) *kuesteri*; 2142, 2143 - *C. (Stichoptera) sanguinolenta*.

16. Impression separating hind part of lateral calli on pronotum deeply and sharply incised ..... 17.
- . Impression separating hind part of lateral calli on pronotum rather shallow, formed by numerous strong punctures. Outline of pronotum as in figs **2141**. Aedeagus as in figs **2139**, **2140**. Length 7.0–9.3 mm. Forms two subspecies: elytral punctures particularly strong, in dorsal part with a tendency to form longitudinal rows

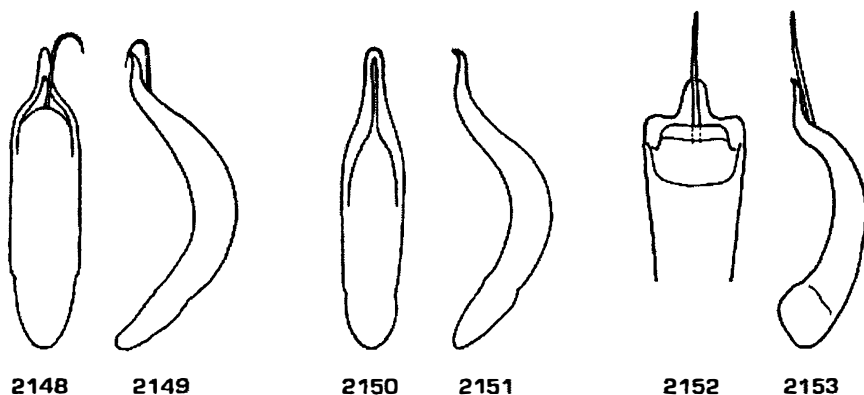


- (ssp. *friderici* WAGNER, 1927 distributed in Iberian Peninsula), elytral punctures in dorsal part confused, not particularly strong (nominotypical subspecies, distributed in remaining part of area). Distributed in Iberian Peninsula, France, northern Italy, Central Europa and basin of Danube; reported also from Kiev .....  
 ..... (*Stichoptera*) ***kuesteri*** (HELLIESEN, 1912).
17. Anterior angles of pronotum shorter, rather obtuse. In anterior part of elytra external rows of punctures 1 and 2 distinctly separate. Aedeagus as in figs **2142**, **2143**. Length 7.0–9.0 mm (= *marginalis* DUFTSCHMID, 1825). Variations: red border on elytra not shortened (typical form), red border on elytra present in anterior part only (ab. *richteri* ROUBAL, 1934). Distributed from Morocco, England and southern part of Scandinavia to Mongolia .... (*Stichoptera*) ***sanguinolenta*** (LINNAEUS, 1758).
- Anterior angles of pronotum longer, slightly sharpened (fig. **2146**). In anterior part of elytra external rows of punctures 1 and 2 close and often a little mixed ..... **18**.
18. General view as in plate LX, **phot. 535**. Aedeagus as in figs **2144**, **2145**. Length 8.5–11.0 mm (= *rufomarginata* SUFFRIAN, 1851). Variation: red border of elytra broader, reaching to third external rows of punctures (ab. *gaubili* LUCAS, 1849). Forms three subspecies: lateral impressions on pronotum very strongly punctate, pronotum with rather strong bluish reflex (subsp. *grossepunctata* LINDBERG, 1950 from Canary Islands), in male surface of pronotum without microreticulation, shining (subsp. *lucidicollis* KÜSTER, 1845 from Mediterranean area), pronotum in male reticulate, lateral impressions moderately strongly punctate (nominotypical subspecies from remaining part of area). Distributed in north-western Africa, Europa to about 58<sup>th</sup> parallel, Asia Minor and Central Asia .....  
 ..... (*Stichoptera*) ***gypsophilae*** (KÜSTER, 1845).
- Similar to *gypsophilae* subsp. *grossepunctata* (thesis 18), but without bluish reflex on pronotum alike with punctures on elytra finer and more densely scattered. Aedeagus not studied. Length 10.5 mm. Perhaps a local race of *gypsophilae*. Described from Gran Canaria based on one male only .....  
 ..... (*Stichoptera*) ***grancanariensis*** (LINDBERG, 1953).



Figs 2144 -2147. *Chrysolina (Stichoptera) gypsophilae* (after WARCHALOWSKI 1993): 2144, 2145 – aedeagus in dorsal and lateral view; 2146, 2147 – pronotum.

19. Lateral margins of pronotum not thickened, separated from central part by a not impressed stripe of punctures. Red stripe cover epipleura and first impunctate lateral interval. Upper side black usually with feeble bronzy reflex. Head and central part of pronotum strongly, sometimes mirror-like shining, elytra usually with silky sheen. Aedeagus as in figs **2148**, **2149**. Length 3.5–6.0 mm (= *schach* FABRICIUS, 1792). Variations: metallic reflex of upper side absent (ab. *tristis* TENENBAUM, 1927), metallic reflex of upper side feeble, dark greenish, bluish or violaceous (ab. *lomata* HERBST, 1783), metallic reflex strong, golden green (ab. *prasina* SUFFRIAN, 1851), upper side pitchy brown, metallic reflex strong, bronzy (ab. *brunneomicans* ROUBAL, 1942). Distributed from Catalonia, eastern France, southern Fennoscandia, northern Italy, Central and Eastern Europe to Ural and Caucasian countries .....  
 ..... (Chalcoidea) **analis** (LINNAEUS, 1767).
- . Lateral margins of pronotum at least posteriorly separated by a punctured impression or sharp incised furrow ..... **20**.



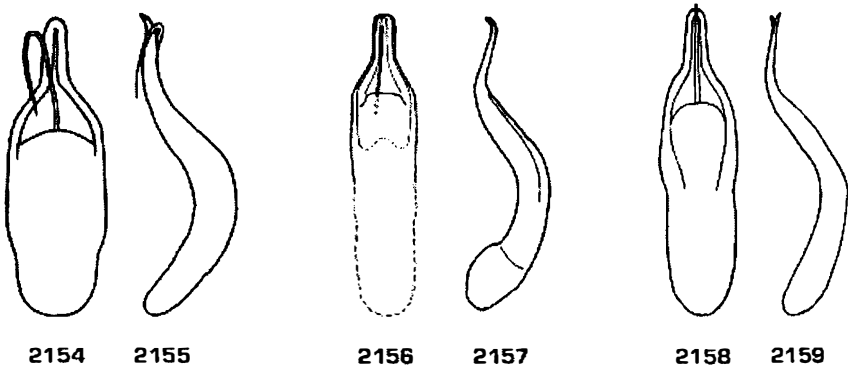
Figs 2148-2153. Aedeagus in dorsal and lateral view (2152, 2153 after BOURDONNÉ and DOGUET 1991, remaining after WARCHAŁOWSKI 1993): 2148, 2149 – *Chrysolina (Chalcoidea) analis*; 2150, 2151 – *C. (C.) carnifex*; 2152, 2153 – *C. (C.) interstincta*.

20. Primary and secondary punctures on elytra of very similar size; in consequence elytral Puncturation seems confused or here and there with traces of regular rows only. Metallic reflex of upper side dark bronzy or dark blue, feeble and not always present. Pronotum with rounded lateral margins, on whole surface distinctly, densely punctulate. Aedeagus as in figs **2150**, **2151**. Length 6.0–9.0 mm. In male two first tarsomeres of all legs widened. Variations: elytra red with black sutural stripe (ab. *konowi* WEISE, 1889), red border of elytra present, remaining part of elytra and pronotum black with blue metallic reflex (ab. *pseudofossulata* BECHYNĚ, 1950), as previous, but metallic reflex bronzy (typical form), elytra without red border, uniformly pure black (ab. *aethiops* OLIVIER, 1807), elytra uniformly blue black (ab. *lugdunensis* BECHYNĚ, 1949). Geographical variability very great, *carnifex* forms several subspecies: puncturation of elytra fine (nominotypical subspecies, from

- Central Europe), puncturation of elytra fine, body more slender than in *carnifex* s. str., elytra always uniformly coloured, without red border (subsp. *melanaria* SUFFRIAN, 1851 = *provincialis* HAROLD, 1874, from south-eastern France), as previous, but body more stout than in *carnifex* s. str. (subsp. *burdigalensis* BECHYNÉ, 1949, from basin of Garonne), puncturation of elytra strong, not particularly scarce, ab. *lugdunensis* predominate (subsp. *coerulescens* SUFFRIAN, 1851, from bassins of Rhein, Moselle and Seine), puncturation of elytra strong and relatively scarce, typical form predominate (subsp. *cruentata* SUFFRIAN, 1851 from Iberian Peninsula), punctures of elytra very strong, partly hollow-like (subsp. *fossulata* SUFFRIAN, 1853, from Catalonia). Distributed in Iberian Peninsula, France, northern Italy, Central Europa and Central Russia ..... (*Chalcoidea*) ***carnifex*** (FABRICIUS, 1792).
- Primary punctures on elytra at least in anterior half much stronger than the secondary ..... **21.**
21. Secondary punctures of elytra distinctly stronger than puncturation on central part of pronotum. Aedeagus as in figs **2152, 2153**. Length 6.0–8.5 mm. Variation: pronotum and discal part of elytra blue steel (ab. *escorialensis* BECHYNÉ, 1949). Forms four subspecies: primary punctures on elytra very great, hollow-like, body slightly flattened (subsp. *graellsii* PEREZ, 1872, from Iberian Peninsula), first external interval of elytra very finely and scarcely punctured (nominotypical subspecies, from Italy), first external interval of elytra distinctly and rather densely punctured, primary punctures moderately strong (subsp. *subseriata* SUFFRIAN, 1851, from southern and central France), body length under 7.0 mm, elytra strongly, more or less coarsely punctured (subsp. *coiffaiti* BECHYNÉ, 1949, from south-western France and Pyrenees). Distributed in south-western Europe ..... (*Chalcoidea*) ***interstincta*** SUFFRIAN, 1851.
- Secondary punctures of elytra not stronger than puncturation on central part of pronotum ..... **22.**
22. Punctures in row 4 arranged rather densely (number of points 30–40), distances on average 1–2 × greater than diameter of punctures ..... **23.**
- Punctures in row 4 arranged rather sparsely (number of points 18–25), distances 3–4 × greater than diameter of punctures ..... **36.**
23. Eurasian species ..... **24.**
- NW African species ..... **33.**
24. In dorsal view apex of aedeagus suddenly narrowed ..... **25.**
- Apex of aedeagus formed differently ..... **28.**
25. Narrowed apical part of aedeagus (**2154, 2155**) elongate. When somewhat different, go to thesis 19. Body black with very feeble bronzy reflex. Elytra a little paler, usually dark reddish brown or pitchy, lateral stripe pale reddish. Pronotum very finely, but always distinctly and deeply punctulate, its lateral margins feebly rounded. Thickened lateral margins separate by a stripe of strong punctures, impressed at basal margin. General view as in plate LX, **phot. 536**. Length 5.5–7.5 mm. Variations: discal part of elytra brownish red with distinct bronzy sheen (typical form), metallic sheen strong, green (ab. *diachalca* BECHYNÉ, 1946), pronotum and discal part of elytra black, metallic reflex very feeble (ab. *solitaria* WEISE, 1884), elytra pale brownish red without metallic reflex (ab. *cinctella* GYLLENHAL, 1827), not only elytra but also pronotum with red border (ab. *marginicollis* DERENNE, 1949). Geographical variability very distinct, the species forms several local races. From discussed area

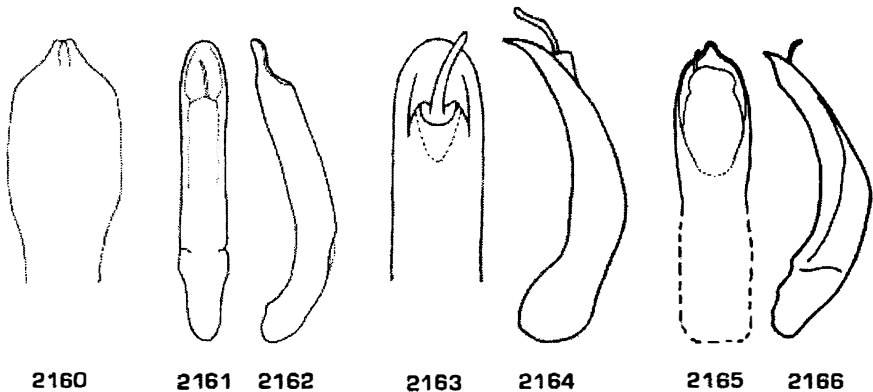
about 10 subspecies are described, the most important are: body length on average 5.5–6.5 mm, upper side in both sexes shining, usually with greenish reflex, elytra flattened, finely punctured (subsp. *glacialis* WEISE, 1884, from Alpes Maritimes), as previous, but elytra more convex and rather strongly punctured (subsp. *dierythra* ROTTENBERG, 1871, from Sicily and southern Italy), length on average 6.5–7.5 mm, in female external interval distinctly convex, elytra very strongly punctured (subsp. *roubali* BECHYNÉ, 1946, from Caucasus), length on average 6.5–7.5 mm, in female external interval flat, on pronotum lateral furrow reaching to the middle of length (subsp. *sculpticollis* BECHYNÉ, 1948, from Pyrenees), length on average 6.5–7.5 mm, sexual dimorphism in body length very feeble, elytra strongly punctured, ab. *solitaria* predominate (subsp. *portai* BECHYNÉ, 1948, from Alps), as previous, but sexual dimorphism in body length distinct, typical form predominate (nominotypical subspecies, from remaining European part of area). In N Africa occurs subsp. *luteocincta* (FAIRMAIRE, 1864). Species distributed in almost whole Europe and in Central Asia from Caspian Sea to Sinkiang .... (*Chalcoidea*) ***marginata*** (LINNAEUS, 1758).

- . Narrowed apical part of aedeagus shorter ..... 26.
- 26. The narrowed apical part of aedeagus very short (fig. 2160). Body smaller. Reflex of upper side bluish, reddish marginal stripe on elytra often somewhat indistinct. Aedeagus. Length 5.1–5.8 mm. Distributed in NE Siberia ..... (*Chalcoidea*) ***instabilis*** (MÄKLIN, 1877).
- . The narrowed apical part of aedeagus moderately long ..... 27.
- 27. The narrowed apical part of aedeagus (figs 2156, 2157). Length about 7.0 mm. Distributed in Near East (Israel, Lebanon, Syria, Iraq, Iran) (*Chalcoidea*) ..... ***marginata*** subsp. ***sanguineocincta*** (CROTCH, 1871).
- . The narrowed apical part of aedeagus (figs 2158, 2159) somewhat shorter. Length about 7.0 mm. Distributed as *sanguineocincta* (thesis 17), perhaps identical with him ..... (*Chalcoidea*) ***marginata*** subsp. ***bodemeyeri*** (WEISE, 1910).
- 28. Apex of aedeagus entirely or laterally rounded, with or without lamella ..... 29.
- . Apex of aedeagus semitriangular ..... 32.



Figs 2154-2159. Aedeagus in dorsal and lateral view (2156, 2157 after BOURDONNÉ and DOGUET 1991, remaining after WARCHAŁOWSKI 1993): 2154, 2155 – *Chrysolina* (*Chalcoidea*) *marginata* s. str.; 2156, 2157 – (*C.*) *marginata sanguineocincta*; 2158, 2159 – *C. (C.) marginata bodemeyeri*.

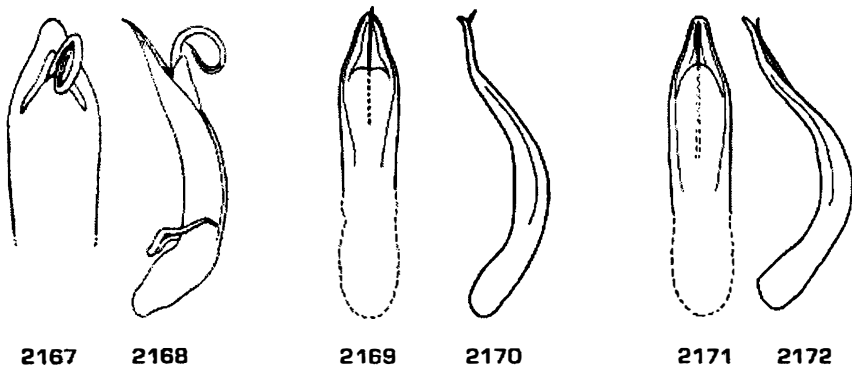
29. Apex of aedeagus rounded, with lamella ..... **31**.  
 -. Apex of aedeagus rounded, without lamella ..... **30**.
30. Pronotum about 2 × broader than long, its surface finely reticulate. Lateral convexity separated from disc by strong punctures, in anterior part doubly, near base grouped in a stripe. Primary puncturation of elytra in anterior half deep and distinct, arranged in geminate rows, in hind half much finer et getting lost among secondary punctures. Aedeagus as in figs **2161**, **2162**. Length 7.0 mm (male) to 7.5 mm (female). Described from Kazakhstan (distr. Alma-Ata) .... (*Chalcoidea*) **lehri** (LOPATIN, 1970).  
 -. Lateral convexity of pronotum separated by a furrow, very well-developed in hind part. General view as in plate LX, **phot. 537**. Externally very similar to *sahlbergiana*, differing mainly by the form of aedeagus (figs **2163**, **2164**). Length 6.7 mm. Described from Tuva ..... (*Pezocrosita*) **tuvensis** MEDVEDEV, 1976.
31. Apex of aedeagus with small lamella (figs **2165**, **2166**). External characters as in *marginata*. Described from High Atlas .... (*Craspeda*) **furva** (PEYERIMHOFF, 1926).  
 -. Apex of aedeagus with broad lamella (figs **2167**, **2168**). Lateral thickenings of pronotum separated from disc by long furrow. Pronotum about 2 × broader than long, its disc covered by very fine reticulation, somewhat silky. Elytra in male feebly shining, in female semimatt. Primary puncturation of elytra arranged in paired, not very regular rows, in hind part mostly confused. General view as in plate LX, **phot. 538**. Length 6.0–7.5 mm (male) to 7.5–8.0 mm (female). Distributed in Sayan Mountains, in N Mongolia and in in south part od Yenissei basin .....  
 ..... (*Pezocrosita*) **sahlbergiana** (JACOBSON, 1901).



Figs 2160-2166. Aedeagus in dorsal and lateral view (2160 after MEDVEDEV 1992; 2161, 2162 after LOPATIN 1970; 2163, 2164 after MIKHAILOV 2002; 2165, 2166 after BOURDONNÉ and DOGUET 1991): 2160 – *Chrysolina* (*Chalcoidea*) *instabilis*; 2161, 2162 – (*C.*) *lehri*; 2163, 2164 – *C.* (*Pezocrosita*) *tuvensis*; 2165, 2166 – *C.* (*Craspeda*) *furva*.

32. Red bordering of elytra run only along apex and lateral margins. Aedeagus as in figs **2169**, **2170**. Length 7.0–8.0 mm. Variations: metallic reflex of upper side bronzy (ab. *chalybaea* BRANCSIK, 1899), metallic reflex of upper side bluish (ab. *cyanescens*

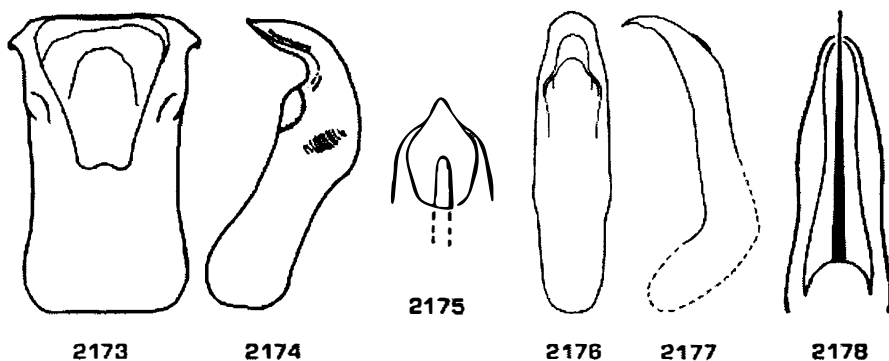
- JACOBSON, 1894). Distributed in Caspian area and Caucasian countries. Here probably the insufficiently studied species *amasiensis* WEISE, 1894 from Asia Minor ...  
 ..... (Chalcoidea) **hyrcana** (WEISE, 1884).
- . Red bordering of elytra run also along basal margin. Aedeagus as in figs **2171, 2172**. Length 6.0–8.0 mm. Distributed in basin of Danube, SE Europe and Central Asia ...  
 ..... (Chalcoidea) **cinctipennis** (HAROLD, 1874).
33. Lateral impressions on pronotum, even at the basis, absent or almost absent. Upper side with green metallic reflex or sheen, epipleura and very narrow lateral margin on elytra reddish. Primary punctures on elytra forms very regular, but not dense longitudinal rows. Body rather short and convex. Aedeagus as in figs **2173, 2174**. Length about 6.0 mm. The sole representative of subgenus *Atlasiana* BOURDONNÉ et DOGUET, 1991. Described from Algeria .....  
 ..... (Atlasiana) **seriatipora** (FAIRMAIRE, 1867).
- . Lateral impressions on pronotum well-developed ..... **34**



Figs 2167-2172. Aedeagus in dorsal and lateral view (2167, 2168 after MOHR 1966; 2169, 2170 after BOURDONNÉ and DOGUET 1991; 2171, 2172 after WARCHALOWSKI 1993): 2167, 2168 – *Chrysolina (Pezocrosita) sahlbergiana*; 2169, 2170 – *C. (Chalcoidea) hyrcana*; 2171, 2172 – *C. (C.) cinctipennis*.

34. Aedeagus apically rounded, with a triangular lamella (fig. **2175**). Borders of pronotum in dorsal view very narrow, limited by a shallow, rather strongly and scarcely punctured furrow. Length 6.0–7.0 mm. Described from Morocco, perhaps conspecific with *vagecincta* FAIRMAIRE, 1875, from Tunisia, differing from *sarroensis* by absence of apical lamella on aedeagus .... (Chalcoidea) **sarroensis** (KOCHER, 1958).
- . Aedeagus without a triangular lamella at apex ..... **35**.
35. Lateral margins of pronotum distinctly rounded and thickened, separated from central part by a distinct longitudinal impression. Primary punctures on elytra fine and dense. Aedeagus as in figs **2176, 2177**. Length 7.0–8.5 mm (here perhaps some forms described as *superstes*, antithesis 35: var. *crebieri* KOCHER, 1958, var. *anti-atlantica* KOCHER, 1958 and subsp. *rouleau* KOCHER, 1958). Distributed in High Atlas and in Anti-atlas ..... (incerti subgeneris) **villiersi** (PEYERIMHOFF, 1939).

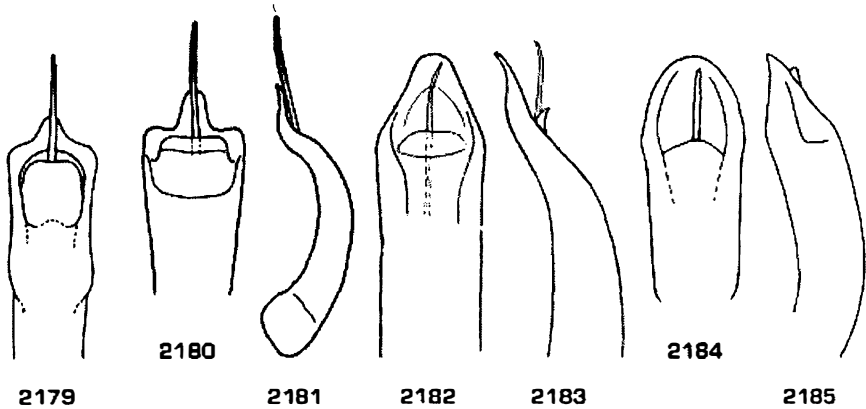
- Lateral margins of pronotum feebly rounded and thickened, longitudinal impression shallow. Aedeagus as in fig. 2178). Length 6.7–8.0 mm. Variations (perhaps local races): upper side black with feeble, bronzy metallic reflex, without red border, body length 6.7–7.3 mm (ab. *ifranensis* KOCHER, 1958, from central part of Middle Atlas), upper side black with blue sheen and red borders, elytra relatively scarcely punctured (ab. *antoinei* KOCHER, 1958, from oriental part of Middle Atlas). Distributed rather widely in Morocco, particularly in Middle Atlas ..... (Chalcoidea) **superstes** (BEDEL, 1921).



Figs 2173–2178. Aedeagus or its apical part in dorsal and lateral view (2175 after KOCHER 1958; 2178 after BOURDONNÉ and DOGUET 1991; remaining after BIENKOWSKI 2001): 2173, 2174 – *Chrysolina* (*Atlasiana*) *seriatipora*; 2175 – *C. (Chalcoidea) sarroensis*; 2176, 2177 – *C. (incerti subg.) villiersi*; 2178 – *C. (Chalcoidea) superstes*.

- 36. Apex of aedeagus with a short and broad process, flagellum very long ..... 37.
- Apical margin of aedeagus rounded, body oval ..... 38.
- 37. Species distributed in Caucasian countries. External interval of elytra entirely impunctate. Body black, lateral border of elytra orange. Aedeagus as in fig. 2179. Length 6.0–7.0 mm (= *kulzeri* BECHYNÉ, 1950) ..... (Chalcoidea) **tesari** (ROUBAL, 1936).
- Westmediterranean species. Aedeagus as in figs 2180, 2181. Distributed in Italia, France and Iberian Peninsula: *interstincta* (thesis 21).
- 38. Red lateral stripe of elytra encroach partly on anterior margin, reaching almost to scutellum ..... 39.
- Red lateral stripe of elytra does not encroach on anterior margin ..... 40.
- 39. Rows of punctures distinctly geminate, dense, intervals very finely and sparsely punctulate. Upper side shining. Red bordering of elytra rather broad. Outline of body short oval, pronotum short, very finely punctate, lateral impressions feeble. Aedeagus not studied. General view as in plate LX, phot. 539. Length about 7.0 mm (= *libanicola* MARSEUL, 1868 = *peyroni* ANCEY, 1876). Distributed in Lebanon and Syria ..... (*Taeniosticha*) **dohrnii** (FAIRMAIRE, 1865).

- Primary puncturation on elytra not dense, very regular. Upper side feebly shining, semimatt. Red bordering of elytra narrow. Apex of aedeagus (figs 2182, 2183) forms a parallel-sided almost transversely cut projection, in lateral view bent dorsally. Primary punctures on elytra very regular. Described from Peloponnes .....  
..... (Taeniossticha) **taigetana** BECHYNÉ, 1952.

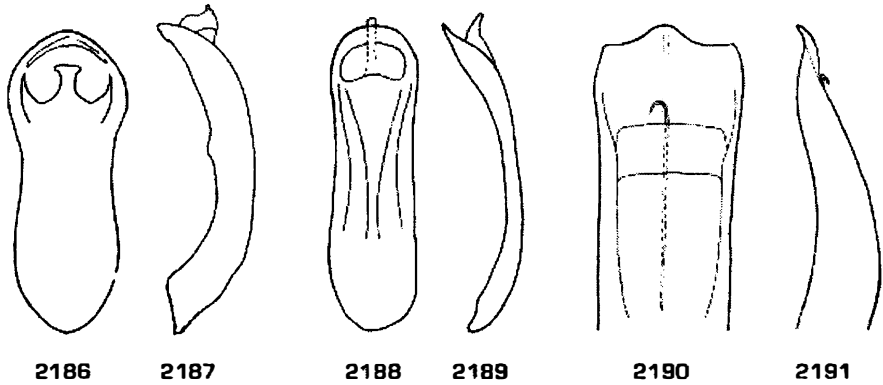


Figs 2179-2185. Apical half of aedeagus in dorsal and lateral view (2179 after BECHYNÉ 1950; 2180, 2181 after BOURDONNÉ and DOGUET 1991; 2182, 2183 after BIEŃKOWSKI 2001; 2184, 2185 after KIPPENBERG in litt.): 2179 – *Chrysolina (Chalcoidea) tesari*; 2180, 2181 – *C. (C.) interstincta*; 2182, 2183 – *C. (Taeniossticha) taigetana*; 2184, 2185 – *C. (Paradiachalcoidea) palmyrensis*.

- 40. Apical part of aedeagus distinctly or at least slightly widened ..... 41.
- Apical part of aedeagus not or only very slightly broadened ..... 42.
- 41. Rows of primary punctures on elytra almost equidistant. Species from Near East. Aedeagus as in figs 2184, 2185. In female underside of first mid- and hind tarsomere entirely covered by short setae, without a median nude stripe. Length 5.5–7.0 mm. Nominotypical subspecies distributed in Israel and Lebanon; in Iraq forms a subsp. *assurensis* BECHYNÉ, 1955, smaller and stronger punctured. Possibly a western race of *aegyptiaca* (thesis 42) ..... (*Paradiachalcoidea*) **palmyrensis** BECHYNÉ, 1955.
- Rows of primary punctures on elytra distinctly geminate. Species from Transcaspia. Aedeagus as in figs 2186, 2187. Distributed in Transcaspia, E Transcaucasia, Iran and Afghanistan ..... (*Diachalcoidea*) **sacaram** (WEISE, 1890).
- 42. Aedeagus in dorsal view parallel with broadly rounded apex. In female underside of first tarsomere in all legs with a median nude stripe. Rows of primary punctures on elytra almost equidistant. Length 6.0–7.0 mm. Forms a subsp. *aleppensis* BECHYNÉ, 1955, smaller and with lateral borders of pronotum very distinctly convex. Distributed in NE Africa and Near East: nominotypical subspecies in Egypt and Libya, subsp. *aleppensis* in Syria ..... (*Diachalcoidea*) **aegyptiaca** (OLIVIER, 1807).
- Aedeagus (figs 2188, 2189) in apical part slightly broadened. Rows of primary punctures on elytra almost equidistant. General view as in plate LX, **phot. 540**.



Length 5.8–7.2 mm. Described from Tadzhikistan .....  
 ..... (*Diachalcoidea*) ***badakshanica*** (IABLOKOFF-KHNZORIAN, 1978).



Figs 2186-2191. Aedeagus in dorsal and lateral view (2186, 2187 after LOPATIN 1977; 2188, 2189 after IABLOKOFF-KHNZORIAN 1978; 2190, 2191 after BIENKOWSKI 2001): 2186, 2187 – *Chrysolina* (*Diachalcoidea*) *sacarum*; 2188, 2189 – *C. (D.) badakshanica*; 2190, 2191 – *C. (incerti subg.) seriepunctata*.

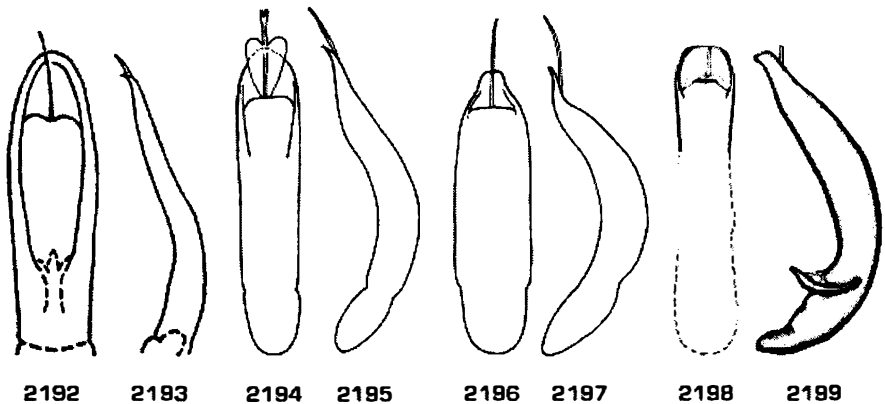
### Auxiliary group E

Primary punctures of elytra arranged in regular rows.

#### Key to species

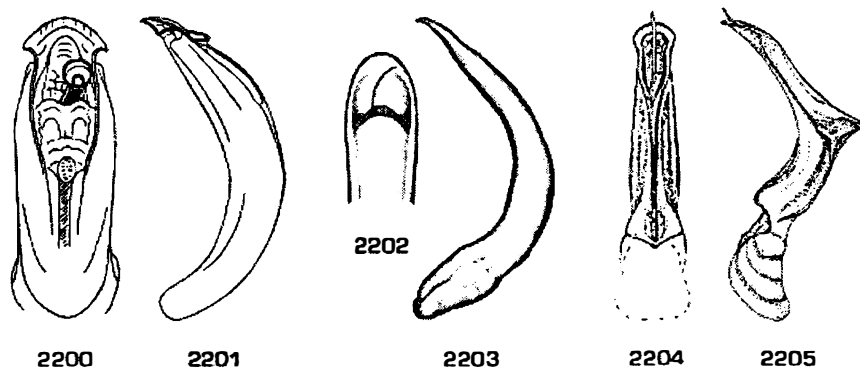
1. Secondary puncturation on elytra strong or at least well-developed, metallic reflex of upper side absent or very feeble, apex of aedeagus usually suddenly narrowed. Here also entirely dark forms of *carnifex*, (group D, thesis 20), *superstes* (group D, antithesis 35) and *villiersi* (group D, thesis 35) ..... **2.**
- . Secondary puncturation on elytra often distinct, but fine or very fine ..... **6.**
2. Hind tarsomere 3 beneath covered with setae at sides only, with bare median stripe and deeply emarginate on apical margin. Primary puncturation very strong, sparse, each puncture surrounded by a little shining, black, blue or violaceous area. Upper side densely reticulated, silky, elytra with weak bronzy hue, pronotum coloured similarly or somewhat with hue slightly bluish. Aedeagus not studied. Length 6.5–8.0 mm. W Mediterranean species distributed in Libya, Cyprus, Israel and Asia Minor ..... (*Bittotaenia*) ***compuncta*** (WEISE, 1898).
- . Hind tarsomeres without bare median stripe, primary punctures on elytra not particularly strong and not surrounded by shining area ..... **3.**
3. Species from E Siberia. Almost regularly broadly oval, upper side black with blue or bronzy reflex, very strongly shining. Pronotum 2× broader than long, impression

- separating lateral thickenings shallow, only at the base slightly deeper, nowhere furrow-like. Lateral thickenings very weakly convex, very smooth and shining. Primary punctures on each elytron arranged in 9 (1 + 4×2) longitudinal rows, intervals covered by relatively strong secondary puncturation, here and there arranged also in shorter semiregular rows. Among strong secondary puncturation are scattered rather sparse extremely fine punctulation. Aedeagus as in figs **2189**, **2190**. Length 5.2–6.4 mm. Distributed in basin of Amur and in Ussuria ..... (incerti subgeneris) ***seriepunctata*** (WEISE, 1887).
- . Species from the Mediterranean area and Caucasus. Upper side not particularly strongly shining ..... **4**.
- 4.** Aedeagus (figs **2192**, **2193**) gently narrowed before regularly rounded apex. Body pitchy-black. Externally similar to *hyrcana* (auxiliary group D, thesis 32), but differs by unicolorous elytra and to *armeniaca* (thesis 5), but here differs by aedeagus-shape. Length about 7.5 mm, described from W Caucasus, based on one couple only ..... (*Chalcoidea*) ***levi*** OKHRIMENKO, 1990.
- . Apex of aedeagus not rounded ..... **5**.
- 5.** Body slightly flattened, aedeagus (figs **2194**, **2195**) very long (about 4.0 mm) and characteristic: flagellum on apex forked, in mid part flattened and strongly broadened, heart-shaped. Body black, upper side with very feeble violaceous reflex, primary. Puncturation of elytra fine, blurred by almost equally strong secondary Puncturation of intervals. Length 9.0–10.2 mm. Distributed in Caucasian countries ..... (*Paracrosita*) ***armeniaca*** (FALDERMANN, 1837).
- . Body convex, aedeagus not conspicuously formed. Primary puncturation of elytra arranged in regular, dense rows, distinctly stronger than the secondary puncturation of intervals. Aedeagus as in figs **2196**, **2197**. Length 6.8–7.6 mm (= *janbechyi* COBOS, 1953). Distributed in southern and central part of Spain ..... (*Chalcoidea*) ***curvilinea*** WEISE, 1884.



Figs 2192–2199. Aedeagus in dorsal and lateral view (2192, 2193 after OKHRIMENKO 1990; 2194, 2195 after LOPATIN 1977; 2196, 2197 after BOURDONNÉ and DOGUET 1991; 2198, 2199 after BOURDONNÉ 1996): 2192, 2193 – *Chrysolina* (*Chalcoidea*) *levi*; 2194, 2195 – *C. (Paracrosita) armeniaca*; 2196, 2197 – *C. (Chalcoidea) curvilinea*; 2198, 2199 – *C. (Mimophaedon) pourtoyi*.

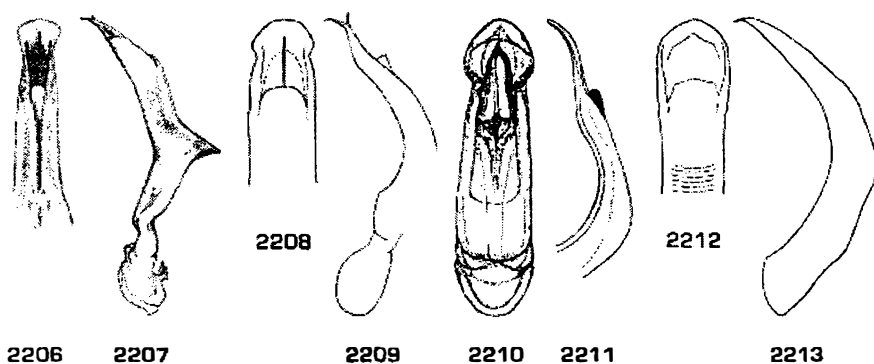
6. Borders of pronotum not or only indistinctly thickened and not or only very indistinctly separated from disc by broad, very shallow longitudinal impression ..... **7**.  
 -. Pronotum with thickened borders, at least near the basis separated from disc by a furrow or impression ..... **15**.
7. Species from Pyrenees. Body small (4.5–5.0 mm), upper side metallic green with golden reflex, antennae and legs brownish. Aedeagus as in figs **2198**, **2199**. Endemic to Pyrenees ..... (*Mimophaedon*) **pourtoyi** BOURDONNÉ, 1996.  
 -. Species from Asia ..... **8**.
8. Borders of pronotum not thickened and not separated from disc. Upper side bronzy. Anal sternite in both sexes without impressions. Primary punctures geminate, intervals convex, impunctate. Tibiae not broadened apically. Aedeagus as in figs **2200**, **2201**. Length 7.0–9.6 mm. Forms two subspecies: more slender and less convex, upper side more vivid coloured, often green or coppery, no intervals more convex than remaining (subspecies nominotypica); more stout and convex, upper side bronzy, intervals 1, 3 and 5 more convex (subsp. *khakassa* MIKHAILOV, 2002), Described from Sayan Mountains ..... (*Timarchoptera*) **soiota** (JACOBSON, 1924).  
 -. Not as above ..... **9**.
9. Hind wings partly reduced, but reaching elytral apical slope. Apex of aedeagus (figs **2002**, **2003**) rounded. Lateral thickenings of pronotum absent or almost absent. Upper side semimatt, black, usually with coppery metallic reflex. Primary punctures in anterior part of elytra arranged in semiregular rows, in hind part random. Length 6.2–7.7 mm (= *montana* GEBLER, 1848). Distributed in Altai and Kuznetzkij Alatau ..... (*Helioptera*) **gibbipennis** (FALDERMANN, 1835).  
 -. Hind wings absent, flagellum not forked ..... **10**.



Figs 2200–2205. Tubular part of aedeagus in dorsal and lateral view (2200, 2201 after MIKHAILOV 2002; 2203 after BOURDONNÉ 2007; 2204, 2205 after MIKHAILOV 2000): 2200, 2201 – *Chrysolina* (*Paraheliostola*) *soiota*; 2202, 2203 – *C. (Bechymia) gibbipennis*; 2204, 2205 – *C. (Sibiriella) capricornus*.

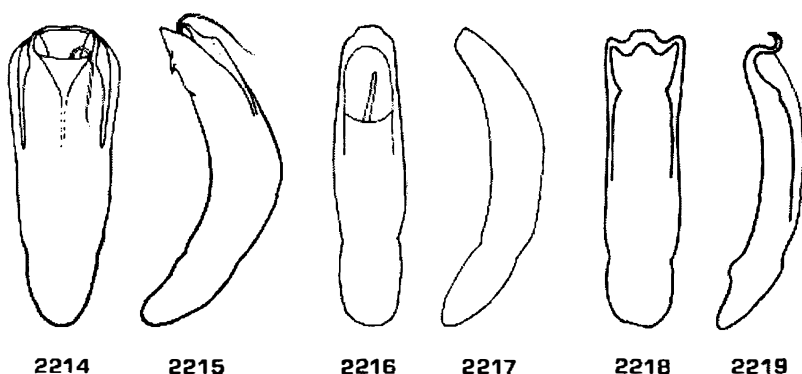
10. Aedeagus in lateral view angularly bent ..... **11**.  
 -. Aedeagus not angularly bent ..... **12**.
11. Pronotal impressions barely perceptible. Rows of primary punctures on elytra equidistant, secondary punctures much finer than primary. Aedeagus as in figs **2204**,

- 2205.** Length 6.5–7.0 mm (male) to 7.8–8.0 mm (female). Distributed in E Kazakhstan (NW Altai) ..... (*Sibiriella*) ***capricornus*** MIKHAILOV, 2000.
- . Pronotal impressions very shallow, but perceptible in whole length. Rows of primary punctures geminate, hidden among strong secondary puncturation. Aedeagus as in figs **2206**, **2207**. Length 7.1 mm. Described based on one male only. Distribution uncertain, the holotype was collected probably in Sayan Mountains ..... (*Sibiriella*) ***paradoxa*** MEDVEDEV, 1999.
12. Aedeagus in lateral view wavy bent in apical part, in dorsal view constricted behind apex ..... **13**.
- . Aedeagus not wavy bent, its apex without constriction ..... **14**.
13. Upper side bronzy, sometimes with violaceous or greenish reflex. Aedeagus as in figs **2208**, **2209**. Length 6.3–7.5 mm. Two subspecies were described: colouration of body as above (subsp. *nominotypica*); upper side brassy green, secondary puncturation on elytra stronger as in *nominotypical* subspecies (subsp. *ivanovskiana* MIKHAILOV, 2000, perhaps a local form only). Distributed in Altai ..... (*Sibiriella*) ***dudkoi*** MIKHAILOV, 2000.
- . Upper side greenish-blue. Aedeagus as in figs **2210**, **2211**. Length about 6.5 mm (= *ogloblini* MIKHAILOV, 2000, nec TER-MINASSJAN 1950). Distributed in W Altai .... (*Sibiriella*) ***kholsunica*** MIKHAILOV, 2001.
14. Apex of aedeagus (figs **2212**, **2213**) in dorsal view regularly rounded. Lateral thickenings of pronotum present, but very weakly developed, from central part barely separated. Upper side shining. Length 5.0–7.0 mm (= *despecta* KONTKANEN, 1957). Described from Siberia (vicinity of Tomsk) ..... (*Sibiriella*) ***schewyrewi*** (JACOBSON, 1895).
- . Upper side black with bluish reflex ..... (*Sibiriella*) ***katonica*** LOPATIN, 1988.
15. Thickened lateral borders of pronotum on the inner side on whole length very distinctly separate by a smooth, rather sharp-edged, impunctate (or very finely and indistinctly punctate) furrow ..... **16**.
- . Lateral borders of pronotum (thickened or not) separate from central part either by a stripe of points or by punctured, often shortened furrow ..... **23**.



Figs 2206–2213. Aedeagus or its apical part in dorsal and lateral view (2206–2209 after MIKHAILOV 2000; 2210, 2211 after BIENKOWSKI 2005; 2212, 2013 after LOPATIN 1998): 2206, 2207 – *Chrysolina* (*Sibiriella*) *paradoxa*; 2208, 2209 – *C. (S.) dudkoi*; 2210, 2211 – *C. (S.) kholsunica*; 2212, 2213 – *C. (S.) katonica*.

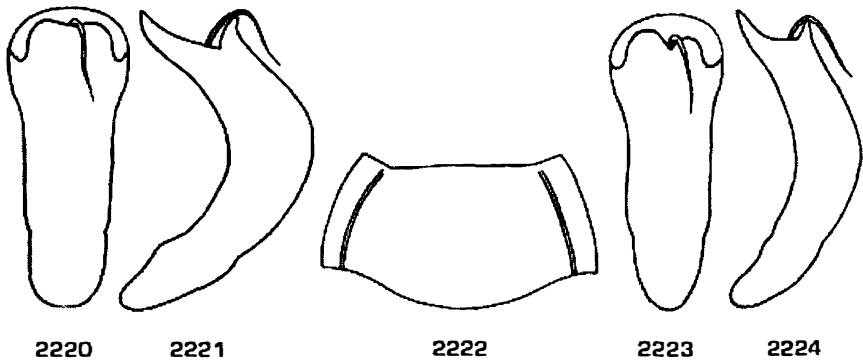
16. Elytron with longitudinal costae ..... **17.**  
 - Elytra without costae ..... **18.**
17. Elytron laterally with two deep, longitudinal furrows, separate by a high costa. General view as in plate LXI, **phot. 541**. Upper side very smooth with metallic sheen. Pronotum bluish, in central part impunctate, glassy, elytra greenish, very finely punctured. Aedeagus not studied. Length about 9.0 mm (= *onychina* WOLLASTON, 1860). Endemic to Madeira ..... (*Rhysoloma*) ***fragariae*** (WOLLASTON, 1854).  
 - Elytron without deep, longitudinal furrows, with 3 feebly elevate longitudinal costae, remaining characters similar as in previous species. Aedeagus not studied. Endemic to Canarian Islands ..... (*Chrysolina* s. str.) ***costalis*** (OLIVIER, 1807).
18. Lateral margins of pronotum almost straight or straight, converging anteriorly. Length 7.0–9.5 mm ..... **19.**  
 - Lateral margins of pronotum rounded. Length 5.8–7.5 mm ..... **20.**



Figs 2214–2219. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1993): 2214, 2215 – *Chrysolina (Sulcicollis) oricalcia*; 2216, 2217 – *C. (S.) peregrina*; 2218, 2219 – *C. (Ovosoma) susterai*.

19. Elytral punctures rather strong, arranged on each elytron in 9 regular or almost regular rows. Upper side black, shining, with feeble bronzy or bluish reflex, elytra usually paler, pitchy or dark reddish brown. Underside and legs black or pitchy, usually with perceptible metallic reflex. General view as in plate LXI, **phot. 542**. Pronotum (outline as in figs **1388**) smooth, practically impunctate, with strong, often mirror-like sheen, lateral furrow purely and sharply incised. Aedeagus as in figs **2214**, **2215**. Length 7.0–9.0 mm (= *bulgarensis* SCHRANK, 1781). Variations: metallic sheen of upper side green (ab. *lamina* FABRICIUS, 1792), metallic sheen blue, pronotum sometimes greenish-blue (ab. *laevicollis* OLIVIER, 1807), metallic sheen intense cupreous (ab. *roscida* BECHYNÉ, 1946), metallic sheen purplish (ab. *protrusa* BECHYNÉ, 1946), pronotum blue, elytra violaceous (ab. *pagana* BECHYNÉ, 1946), pronotum blue or greenish blue, elytra reddish with bluish reflex (ab. *dieneri* MERKL, 1897), pronotum black, elytra brown with intense metallic sheen (ab. *bicolor* GABRIEL, 1902), upper side black, metallic reflex very feeble or absent (ab. *vieta* BECHYNÉ, 1946). Distributed in south-western England, eastern France, Italy, Balkans, southern Scandinavia,

- Central Europe and Ukraine to Crimea, reported also from Siberia .....  
 ..... (*Sulcicollis*) ***oricalcia*** (MÜLLER, 1776).
- . Elytral punctures rather fine, arranged on each elytron in 12–14, on disc partly irregular rows. Underside and legs reddish brown or reddish, always without metallic reflex. Aedeagus as in figs **2216**, **2217**. Length 7.5–9.5 mm (= *schotti* SUFFRIAN, 1851). Variation: metallic reflex of upper side greenish (ab. *oberndorferi* BRENSKE, 1890). Occurs as three subspecies: larger (8.5–9.0 mm), elytra sparsely and strongly punctured, body rather uniformly brown with metallic reflex (subsp. *impavida* BECHYNĚ, 1949, from eastern part of Mediterranean area – Asia Minor, Lebanon, Israel, Rhodos), smaller (7.5–8.5 mm), elytra densely and moderately strongly punctured, underside brown, upper side brown with cupreous reflex (nominotypical subspecies, from Morocco, Iberian Peninsula, southern France and northern Italy), like the preceding one but smaller (7.0–8.0 mm) and finely punctured (subsp. *erythromera* LUCAS, 1849, from Algeria, Tunisia, Sicily and southern Italy). Distributed in Mediterranean area .... (*Sulcicollis*) ***peregrina*** (HERRICH-SCHÄFFER, 1839).
20. Secondary punctures of upper side extremely fine, ground of pronotum and elytra almost smooth ..... **22**.
- . Secondary punctures of upper side very fine, but distinct and dense ..... **21**.

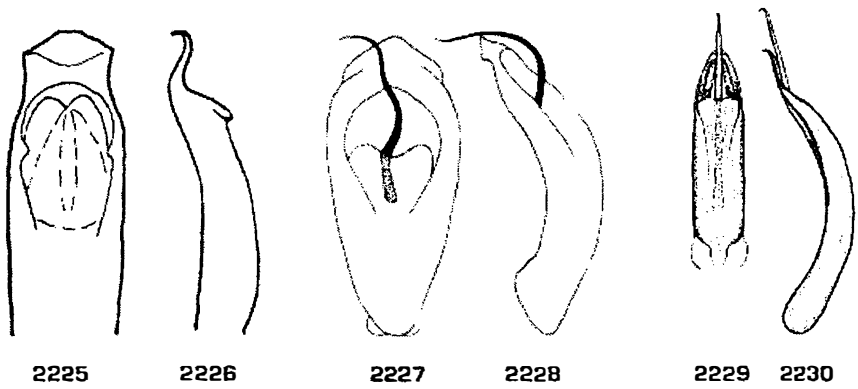


Figs 2220–2224. Pronotum and aedeagus in dorsal and lateral view (after WARCHALOWSKI 1993): 2220–2222 – *Chrysolina* (*Sulcicollis*) *chalcites*; 2223, 2224 – *C. (S.) rufaenea*.

21. Aedeagus as in figs **2218**, **2219**. Body black, metallic reflex absent or extremely feeble, in immature specimens elytra dark reddish-brown or pitchy. Length 7.5–9.5 mm (= *morio* KRYNICKI, 1832, nec FABRICIUS, 1787). Distributed in basin of Danube (Hungary, Slovakia), Romania, Ukraine, southern Russia, northern part of Caucasian area and in Central Asia ..... (*Ovosoma*) ***susterae*** BECHYNĚ, 1950.
- . Aedeagus as in figs **2225**, **2226**. External characters similar as in *susterae* (thesis 10). Forms one subspecies (pronotum and scutellum less densely punctate, subsp. *minckwitzii* APFELBECK, 1912 = ? *winneguthi* MÜLLER, 1948). Feebly studied species, distributed in S Carpathians (nominotypical subspecies) and Balkans (ssp. *minckwitzii*) ..... (*Ovosoma*) ***atrovirens*** (FRIVALDSZKY, 1876).

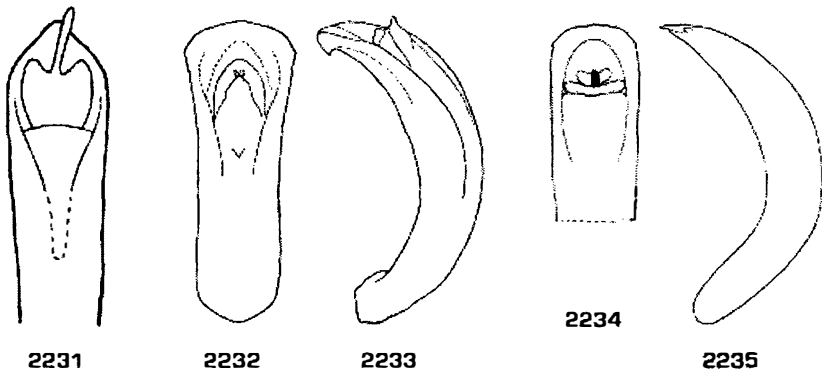
22. Primary punctures of elytra scarce, distances in row 2–4 × greater than diameter of punctures. Outline of pronotum as in figs 2222. Upper side dark brown or black, metallic sheen moderately strong, bronzy. Elytra, particularly by immature specimens, often dark red. Aedeagus as in figs 2220, 2221. Length 6.0–7.5 mm (= *festiva* MÉNÉTRIÉS, 1832). Distributed in south-eastern Europe (Apulia, Balkans, basin of Danube, southern Ukraine, southern Russia), Caucasian countries, Asia Minor, Near East and Central Asia ..... (*Sulcicollis*) ***chalcites*** (GERMAR, 1824).
- . Primary punctures very dense, distances in rows 0.5–1.0 × greater than diameter of punctures. Upper side reddish brown with bronzy metallic sheen, Aedeagus as in figs 2223, 2224. Length 6.0–7.0 mm. Variation: metallic sheen bluish (ab. *fallaciosa* WEISE, 1884). Distribution feebly studied. Encountered in northern Spain, southern part of France, south-western Germany, Switzerland, Austria and Slovakia ..... (*Sulcicollis*) ***rufoaenea*** (SUFFRIAN, 1851).
23. Primary punctures of elytra arranged in regular or almost regular rows (apparently confused in case of very scarce punctures), ground covered by considerably finer, uniform secondary punctures or almost smooth ..... 24.
- . Primary punctures of elytra confused or here ant there arranged in indistinct rows. Sometimes (in uniformly black aberrations of some species with red border, theses rows relatively regular, but secondary punctures of various size, partly even strong – see auxiliary group D).
24. Primary and secondary punctures of elytra of similar size. Primary punctures only in anterior half arranged in somewhat indistinct rows, in hind part random .... 25.
- . Primary structures distinct ..... 28.
25. Upper side blue, violaceous-blue, or black with greenish hue. Iuxtasutural furrow in hind part indistinct or absent. Central part of pronotum convex ..... 26.
- . Upper side black, black with bronzy reflex or black with violaceous hue. Central part of pronotum not convex. Aedeagus as in figs 2227, 2228. Length about 7.5 mm. Described from NW China ..... (*Pezocrosita*) ***belousovi*** LOPATIN, 2000.
26. Antennae entirely, tarsi, labrum, anterior border of clypeus and maxillar palpi pale brown or brownish-yellow, contrasting with remaining parts of body. Upper side black with greenish reflex. Aedeagus as in figs 2229, 2230. Length 7.0–8.1 mm. Described from Tuva ..... (*Pezocrosita*) ***ulughemica*** MIKHAILOV, 2002.
- . Antennae except for two basal antennomeres and tarsi blackish, not contrasting with remaining parts of body. Upper side often blue or violaceous-blue, feebly shining ..... 27.
27. Lateral thickenings of pronotum separated from disc by shallow impression covered by relatively fine punctures. Upper side violaceous with weak purplish reflex. Primary puncturation of elytra loosely scattered, interstices very finely punctulated, secondary puncturation mixed with very fine scratches. Aedeagus not studied. Length about 8.0 mm. Described from NW China. Male unknown. Length about 8.0 mm. Described from NW China ..... (*Pezocrosita*) ***cyanopurpurea*** (BALLION, 1878).
- . Lateral thickenings of pronotum separated from disc by distinct impression in basal part furrow-like its puncturation rather strong. General view as in plate LXI, **phot. 543**. Aedeagus as in fig. 2231. Length 6.8–8.8 mm. Distributed in Tuva and Mongolia ..... (*Pezocrosita*) ***convexicollis*** (JACOBSON, 1901).
28. Lateral thickenings of pronotum more or less narrow, very distinctly separated from disc on whole length by a furrow, disc very uniformly covered by fine punctures.

- Hind tarsomere 3 beneath covered with setae at sides only, with bare median stripe and deeply emarginate on apical margin (subgenus *Bittotaenia*) ..... 29.
- . Lateral thickenings modeartely broad or broad, separated from disc by a impressed stripe of punctures, disc often not uniformly punctured ..... 35.



Figs 2225-2230. Aedeagus in dorsal and lateral view (2225, 2226 after BIENKOWSKI 2001; 2227, 2228 after LOPATIN 1990; 2229, 2230 after MIKHAILOV 2002): 2225, 2226 – *Chrysolina (Ovostoma) atrovirens*; 2227, 2228 – *C. (Pezocrosita) belousovi*; 2229, 2230 – *C. (P.) ulughemica*.

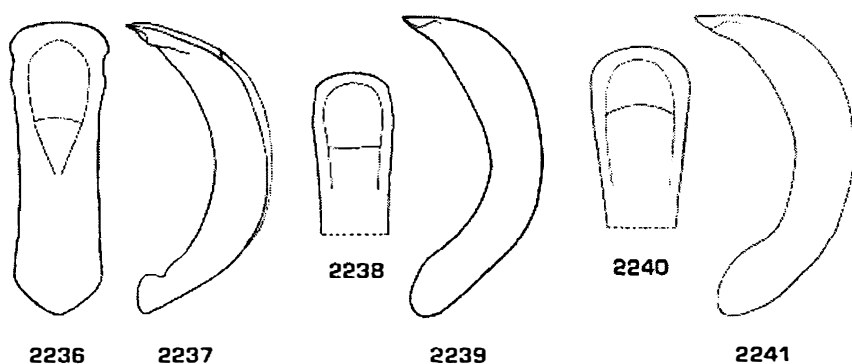
29. Punctuation on hind 1/3 of elytra homogeneous, not differentiated into primary (stronger, arranged in rows) and secondary (finer, confuse) punctures. Upper side black with blue or violaceous metallic reflex, rarely pure black ..... 30.
- . Punctuation on hind 1/3 of elytra heterogenous, differentiated into primary (stronger, arranged in rows) and secondary (finer, confuse) punctures ..... 32.



Figs 2231-2235. Aedeagus or its apical part in dorsal and lateral view (2231 after MEDVEDEV 1982; 2232, 2233 after LOPATIN 1977; 2234, 2235 after DACCORDI 1982): 2231 – *Chrysolina (Pezocrosita) convexicollis*; 2232, 2233 – *C. (Bittotaenia) grata*; 2234, 2235 – *C. (B.) mellyi*.

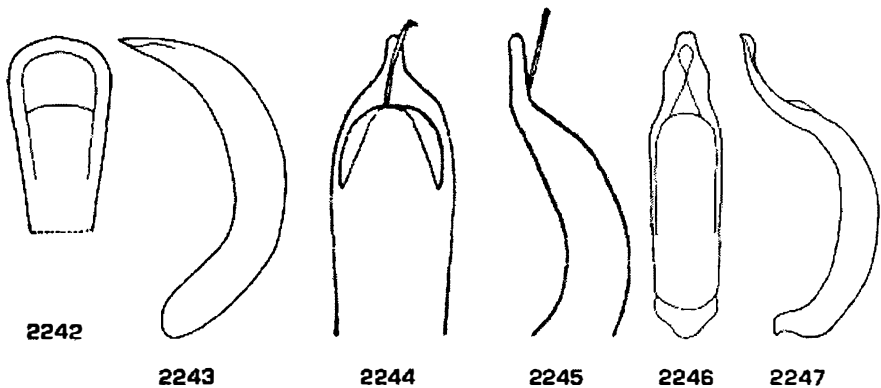


30. Upperside matt. Pronotum very densely punctured, interstices as broad as diameter of punctures. Aedeagus broadened at apex (figs **2232**, **2233**). Length 9.0–11.0 mm. Distributed in Afghanistan, Iran, Turkmenistan and Caucasian countries ....  
 ..... (*Bittotaenia*) **grata** (FALDERMANN, 1837).  
 - At least pronotum not matt ..... **31**.
31. Pronotum slightly shining, elytra matt. Punctuation of pronotum less dense, interstices 1–2 × broader than diameter of punctures. Aedeagus as in figs **2234**, **2235**. Length 9.0–10.5 mm. Distributed in Afghanistan and N India .....  
 ..... (*Bittotaenia*) **mellyi** (STAL, 1857).  
 - Whole upper side shining, body black or with very weak metallic reflex, slightly different on pronotum and elytra. Aedeagus as in figs **2236**, **2237**. Length 8.5–11.0 mm. Described from Tadzhikistan .....  
 ..... (*Bittotaenia*) **turanica** (REITTER, 1888).
32. On elytra secondary punctures (punctuation of intervals) well-developed, relatively strong. Aedeagus as in figs **2238**, **2239**. Variations: metallic reflex on upper side blue or violaceous (typical form), metallic reflex on upper side green or greenish-bronzy (ab. *connectens* BECHYNÉ, 1950). Distributed in southern Europe, Asia Minor and Caucasian countries. Occurs as three subspecies: length 7.0–9.0 mm, upper side shining (nominotypical subspecies, distributed in southern France, Italy and Balkans), length 8.0–10.0 mm, upper side matt, intervals somewhat corrugate (subsp. *sculptipennis* FALDERMANN, 1837, distributed in Asia Minor and Caucasian countries), length 10.5 mm, upper side sparsely punctured, green with olive-green reflex (subsp. *catalonica* BECHYNÉ, 1950, described from Catalonia based on one female only) ..... (*Bittotaenia*) **salviae** (GERMAR, 1824).  
 - On elytra secondary punctures fine and usually shallow ..... **33**.
33. Body length under 9.0 mm ..... **34**.  
 - Body length over 9.0 mm. Body unicolorous, uniformly blue-violaceous. Length 9.8–10.6 mm. Aedeagus (figs **2240**, **2241**) similar as in *grata* (thesis 1). Described from Sinai ..... (*Bittotaenia*) **leonardii** DACCORDI, 1976.



Figs 2236–2241. Aedeagus or its apical part in dorsal and lateral view (2236, 2237 after LOPATIN 1977; 2238, 2239 after WARCHALOWSKI 1993; 2240, 2241 after LEONARDI 1982): 2236, 2237 – *Chrysolina* (*Bittotaenia*) *turanica*; 2238, 2239 – *C. (B.) salviae*; 2240, 2241 – *C. (B.) leonardii*.

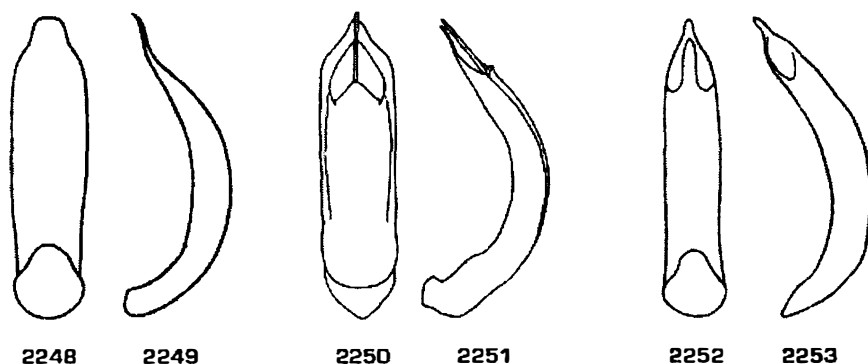
34. Body bicolorous, violaceous with metallic reflex of elytra greenish-bronzy. Pronotum relatively strongly punctured. Aedeagus not studied. Length 8.5–9.0 mm (= *tripolitica* BECHYNĚ, 1950). Distributed in Libya, Egypt, Israel and Syria .....  
 ..... (*Bittotaenia*) ***aeneipennis*** (REICHE, 1858).
- . Body unicolorous, black with bluish-green reflex. Pronotum finely and sparsely punctured, interstices about 4–5 × broader than diameter of punctures. Aedeagus as in figs **2242**, **2243**. Described from Oman .....  
 ..... (*Bittotaenia*) ***brancuccii*** (DACCORDI, 1982).
35. Primary punctures of elytra arranged in regular or almost regular rows (apparently confused in case of very scarce punctures), ground covered by considerably finer, uniform secondary punctures or almost smooth ..... **36**.
- . Primary punctures of elytra confused or here and there arranged in indistinct rows. Sometimes (in uniformly dark aberrations of some species with red border, these rows relatively regular, but secondary punctures of various size, partly strong); see auxiliary group D.
36. Lateral thickenings of pronotum on whole length distinct and convex ..... **37**.
- . Lateral thickenings of pronotum feeble, strongly flattened or absent ..... **133**.
37. Lateral thickening of pronotum on whole length separated from disc by a furrow or impression (usually shallower in 2/5 of its length) ..... **38**.
- . Lateral thickening of pronotum separated from disc by a furrow or distinct impression in hind part only, anteriorly separated by a not impressed stripe of punctures ..... **112**.



Figs 2242–2247. Aedeagus or its apical part in dorsal and lateral view (2242, 2243 after LEONARDI 1992; 2244, 2245 after BIENKOWSKI 2001; 2246, 2247 after LOPATIN 1961): 2242, 2243 – *Chrysolina* (*Bittotaenia*) *brancuccii*; 2244, 2245 – *C. (Chalcoidea) lia*; 2246, 2247 – *C. (Pseudocrosita) bactriana*.

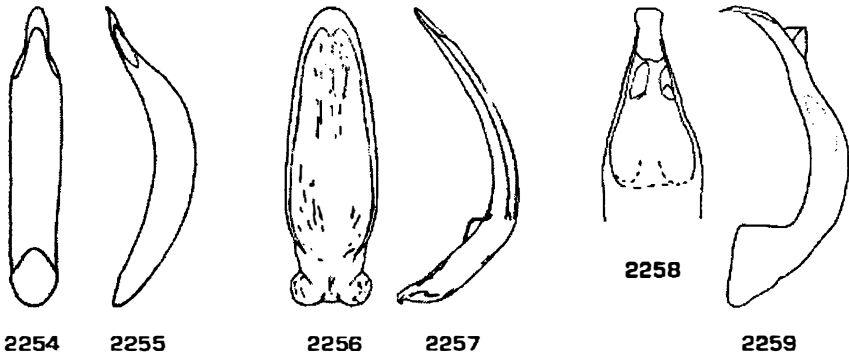
38. Lateral thickening of pronotum at least anteriorly separated from disc by a impressed stripe of strong punctures ..... **39**.
- . Lateral thickening of pronotum on whole length separated from disc by a furrow or impression ..... **41**.

39. Lateral thickening of pronotum anteriorly separated from disc by a impressed stripe of strong punctures and in hind part (about 1/3 of its length) by a furrow ..... **40**.
- Lateral thickenings of pronotum separated from disc on whole length by a stripe of very strong (on average stronger than in primary rows on elytra) punctures. Body almost pure black, with very weak bronzy reflex, red colour of epipleura and lateral borders of elytra usually very distinct, rarely darkened, pitchy-red. Primary punctures on elytra arranged in regular rows reaching to apical part, before apex disappearing. Secondary punctures variable, usually very fine. Aedeagus as in figs **2244, 2245**. Length 7.9–10.5 mm. Distributed in Transcaspia, Iran and Afghanistan ..... (*Chalcoidea*) **lia** (JACOBSON, 1901).
40. Larger species. Disc of pronotum strongly convex. Colouration of body uniformly black. Primary punctures of elytra very distinctly geminate. Aedeagus as in figs **2246, 2247**. Length 9.0–10.0 mm (= *globoicollis* LOPATIN, 1970). Distributed in Kyrghyzstan and Tadzhikistan ..... (*Pseudocrosita*) **bactriana** (LOPATIN, 1961).
- Smaller species. Disc of pronotum not particularly strongly convex. Antennae, legs und labrum rusty or reddish-brown. Elytra very dark black-red, pronotum black. Rows of punctures distinctly geminate, secondary punctation on intervals distinct and deep. Aedeagus as in figs **2248, 2249**. Length 6.0–6.5 mm (= *perfecta* JACOBSON, 1901). Distributed in Mongolia and Transbaikalia ..... (*Pezocrosita*) **rufilabris** (FALDERMANN, 1835).
41. Upper side bicolorous ..... **42**.
- Upper side unicolorous ..... **44**.
42. Upper side shining black, borders of elytra red. Lateral sides of pronotum straight in hind part, rounded anteriorly, fore angles sharp, obtuse on apex. Punctuation of elytra rather strong, uniform, arranged in longitudinal rows, intervals covered by extremely fine secondary punctures, two or three intervals more convex, almost costiform, smooth. Aedeagus not studied. Length 9.0 mm. Described from China (Shantung), reports from southern provinces concern probably another species ..... (*Stichoptera*?) **jacobyi** (BALY, 1878).
- Upper side not black with red elytral borders ..... **43**.



Figs 2248–2253. Aedeagus in dorsal and lateral view (2250, 2251 after MIKHAILOV 2002, remaining after VORONOVA 1985): 2248, 2249 – *Chrysolina* (*Pezocrosita*) *rufilabris*; 2250, 2251 – *C. (P.) medvedevi*; 2252, 2253 – *C. (P.) discriminata*.

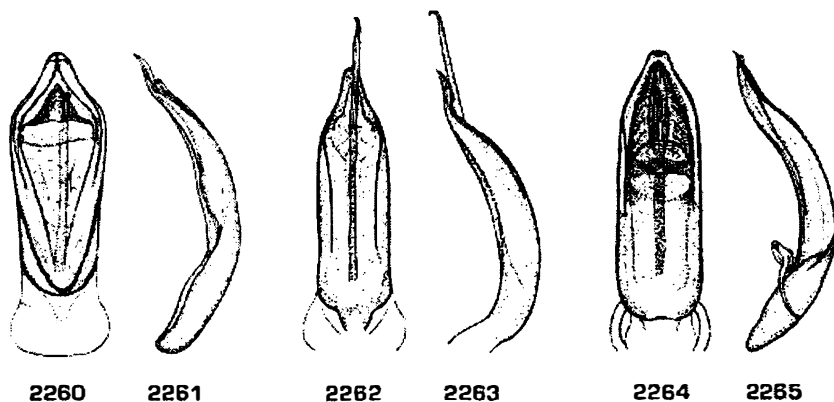
43. Head and pronotum black, elytra uniformly red or dark red to brown-red. Pronotum about 2 × broader than long, lateral thickenings broad, convex, sparsely and finely punctured. Disc of pronotum finely reticulated, moderately shining, rather uniformly punctured. Elytra without humeral calli, on each elytron primary punctures arranged in 9 rows (sutural row and 4 pairs). Distributed in E Kazakhstan ....  
 ..... (*Pezocrosita*) **medvedevi** (LOPATIN, 1970).
- . Pronotum with greenish or bluish reflex, elytra brown with bronzy-violaceous reflex. Body not very convex. Primary punctures arranged in semiregular rows, secondary punctation abundant, about 2 × finer than primary punctures. General view as in plate LXI, **phot. 544**. Length 8.0–9.0 mm. Described from E Siberia (Yakutia) ..... (*Pezocrosita*) **cyaneovinosa** MEDVEDEV, 1978.
44. Upper side black, with greenish or bronzy reflex ..... **45**.
- . Upper side usually brown or rusty-brown, antennae and legs pale brown, underside brown, metallic reflex of upper side often indistinct or absent. In dark specimens upper side pitchy with bronzy reflex, antennae and legs darker brown. Furrow separating lateral thickenings of pronotum very deeply impressed at base. General view as in plate LXI, **phot. 545**. Aedeagus as in figs **2252, 2253**. Length 4.9–5.6 mm (= *fuscipes* WEISE, 1890 nec GMELIN, 1790, *infuscipes* WEISE, 1916). Distributed in Mongolia and in Transbaikalia ..... (*Pezocrosita*) **discriminata** (JACOBSON, 1901).



Figs 2254-2259. Aedeagus in dorsal and lateral view (2254, 2255 after VORONOVA 1985; 2256, 2257 after MIKHAILOV 2002; 2258, 2259 after BIENKOWSKI 2005): 2254, 2255 – *Chrysolina* (*Pezocrosita*) *mongolensis*; 2256, 2257 – *C. (P.) ordinata*; 2258, 2259 – *C. (Arctolina) valichanovi*.

45. Very similar to *discriminata* (antithesis 44), but on average larger and darker, underside blackish, antennae and legs often brownish. Primary punctation of elytra finer and distinctly less regularly arranged than in *discriminata*. Aedeagus as in figs **2254, 2255**. Length 5.5 mm (male) to 7.0 mm (female). Described from Mongolia ..... (*Pezocrosita*) **mongolensis** (LOPATIN, 1966).
- . Not as above ..... **46**.
46. Aedeagus (figs **2256, 2257**) in dorsal view broad, gradually narrowed from base to apex, apex obtusely rounded. Primary punctation of elytra very distinctly geminate, secondary punctures strong, as strong or slightly stronger than primary

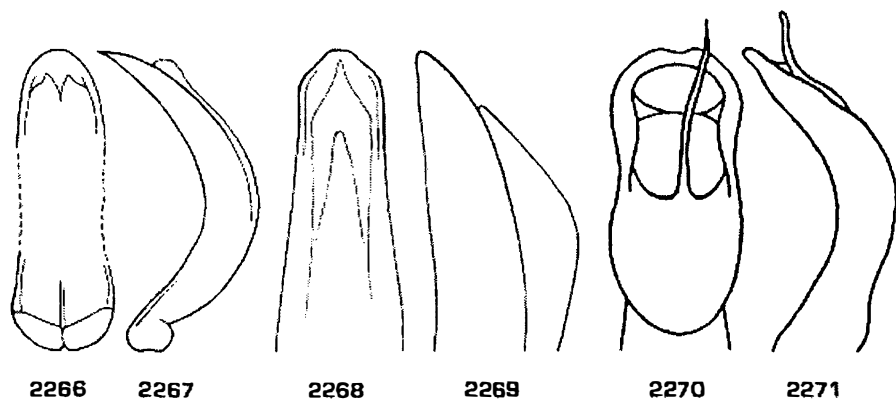
- puncturation of pronotum. Lateral thickenings of pronotum separated on whole length by a small furrow. Upper side black with greenish or bronzy reflex. General view as in plate LXI, **phot. 546**. Length 7.0–9.0 mm. Distributed in NE Kazakhstan, SW Siberia and Altai ..... (*Pezocrosita*) ***ordinata*** (GEBLER, 1823).
- Apex of aedeagus not obtusely rounded ..... **47**.
  - 47. In lateral view aedeagus more or less wavy bent. Its apex in dorssal view gradually narrowed, slender, thevery tip obtusely rounded (figs **2258**, **2259**). Upper side dark bronzy, pronotum often with violaceous reflex. Pronotum covered by uniform, dense, fine punctures, similar to secondary puncturation of elytra. Length 5.3 mm (male) to 6.0 mm (female). Described from E Kazakhstan (Dshungarian Alatau ..... (*Arctolina*) ***valichanovi*** LOPATIN, 1990.
  - In lateral view aedeagus not wavy bent ..... **48**.
  - 48. Primary puncturation of elytra geminate, but somewhat hidden among dense secondary punctures. Lateral thickenings of pronotum at base limited by distinct and deep incision. Pronotum widest before midlength ..... **49**.
  - Primary puncturation of elytra not distinctly geminate, often somewhat irregular, but not hidden among secondary punctures. Lateral thickenings of pronotum at base limited by shallow incision ..... **54**.
  - 49. Smaller and more slender, black with weak bluish reflex. Elytral punctures strong ... ..... **50**.
  - Larger, more shining, elytral puncturation moderately stronge or fine ..... **51**.
  - 50. Apex of aedeagus (figs **2260**, **2261**) approximately triangular. Length 6.9–7.3 mm. Distributed in Tuva ..... (*Pezocrosita*) ***urjanichaica*** (JACOBSON, 1925).
  - Apex of aedeagus (figs **2262**, **2263**) elongate-triangular. Length 7.1–7.2 mm. Described from Tuva ..... (*Pezocrosita*) ***erzinica*** MIKHAILOV, 2002.



Figs 2260-2265. Aedeagus in dorsal and lateral view (after MIKHAILOV 2002): 2260, 2261 – *Chrysolina* (*Pezocrosita*) *urjanichaica*; 2262, 2263 – *C. (P.) erzinica*; 2264, 2265 – *C. (P.) hyperboreica*.

- 51. Apex of aedeagus obtusely triangular ..... **52**.
- Apex of aedeagus in dorsal view rounded ..... **53**.

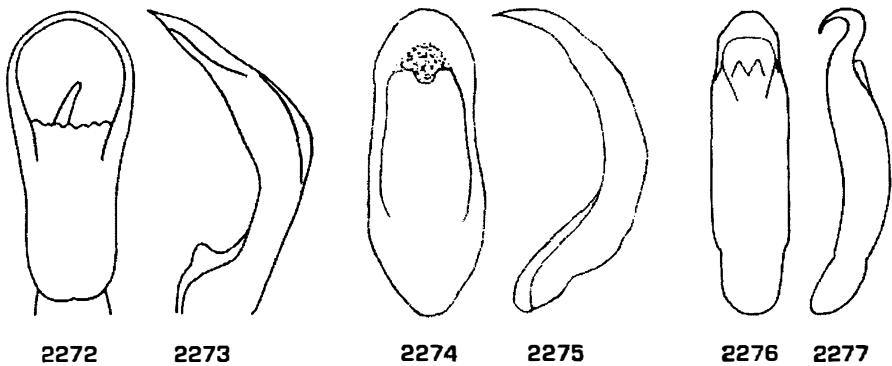
52. Upper side black-violeaceous, elytra sometimes elytra with greenish reflex. Punctuation finer. Length 6.8–8.8 mm, see *convexicollis* (antithesis 27).
- . Upper side bronzy, pronotum with greenish tinge, antennae and legs black. Aedeagus as in figs **2264**, **2265**. Length 8.0 mm. Described from N Ural, based on one male only ..... (*Pezocrosita*) ***hyperboreica*** MIKHAILOV, 2002.
53. Upper side black. Inner rows of elytral rows somewhat irregular. General view as in plate LXI, **phot. 547**. Aedeagus as in figs **2266**, **2267**. Length about 7.5 mm. Distributed in Sayan Mts and in Tuva ..... (*Pezocrosita*) ***tibialis*** JACOBSON, 1895).
- . Upper side bronzy, pronotum often with weak violaceous hue. Inner rows of elytral rows regular. General view as in plate LXI, **phot. 548**. Aedeagus (figs **2268**, **2269**) parallel-sided, its apex rounded; tubular part in lateral view almost straight. Length 6.5–8.3 mm. Distributed from E Kazakhstan to Mongolia and vicinity of Baikal See. Forms two subspecies: as above (nominotypical subspecies); upper side matt, stronger punctured, aedeagus in apical half somewhat gradually narrowed (subsp. *asperata* LOPATIN, 1990). Nominotypical subspecies distributed in Sayan, Tuva and Mongolia, subsp. *asperata* in E Kazakhstan ..... (*Pezocrosita*) ***undulata*** (GEBLER, 1833).



Figs 2266-2271. Tubular part of aedeagus in dorsal and lateral view (2266, 2267 after KONTKANEN 1957; 2268, 2269 after LOPATIN 1990; 2270, 2271 after LOPATIN 1998): 2266, 2267 – *Chrysolina* (*Pezocrosita*) *tibialis*; 2268, 2269 – *C. (P.) undulata*; 2270, 2271 – *C. (P.) dalailamai*.

54. Body length under 4.5 mm. Elytra very short, as long as together broad or (in male) barely longer, convexhumeral calli absent. Upper side black with very feeble bronzy reflex, antennae and legs brown, underside dark brown. Aedeagus as in figs **2270**, **2271**. Described from Tibet ..... (*Pezocrosita*) ***dalailamai*** LOPATIN, 1998.
- . Body length at least 5.0 mm. Elytra more elongate, underside black ..... **55**.
55. Aedeagus as in figs **2272**, **2273**. Body black, shining, antennae and apices of tarsi brown. Pronotum shining, finely punctate, lateral furrows present only at base, in anterior part flattened and replaced by a stripe of shallow and fine points.

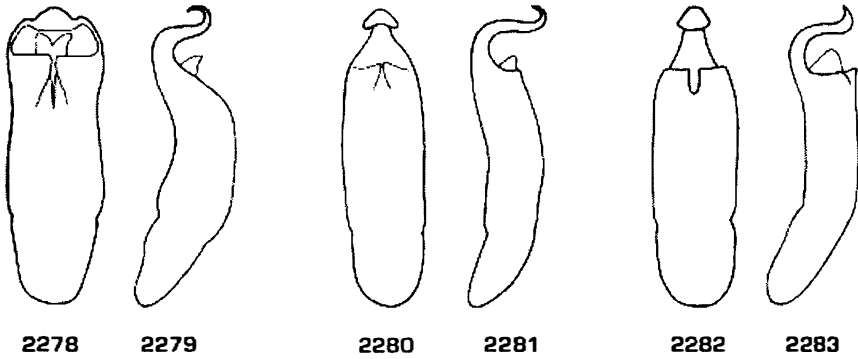
- Secondary puncturation on elytra on disc indistinct, on sides sparse. General view as in plate LXI, **phot. 549**. Length about 5.0 mm. Described from Tibet .....  
 ..... (*Pezocrosita*) ***yupeiyuae*** LOPATIN, 1998.
- Aedeagus differently shaped ..... **56**.
56. Aedeagus as in figs **2274**, **2275**. Similar to *borochorensis* (auxiliary group C antithesis 10) and *yupeiyuae* (thesis 55). Lateral thickenings of pronotum very feebly separated from disc by shallow impression, at base furrow strongly reduced. On elytra intervals impunctate or almost impunctate, in male flat, in female slightly convex. Length 5.2–5.6 mm. Described from Tibet .....  
 ..... (*Pezocrosita*) ***naratica*** LOPATIN, 2000.
- Aedeagus differently shaped ..... **57**.
57. Short furrow limiting hind part of thickened lateral border of pronotum, straight or slightly bent, not very short, even-edged, not affected by punctures ..... **58**.
- Short furrow limiting hind part of lateral border of pronotum very short, jagged, replaced by a stripe of stronger punctures, or absent ..... **105**.
58. Length of body 7.0–11.5 mm ..... **59**.
- Length of body 5.5–7.5 mm ..... **63**.



Figs 2272–2277. Aedeagus in dorsal and lateral view (2272, 2273 after LOPATIN 1998; 2274, 2275 after LOPATIN 2000; 2276, 2277 after WARCHAŁOWSKI 2003): 2272, 2273 – *Chrysolina* (*Pezocrosita*) *yupeiyuae*; 2274, 2275 – *C. (P.) naratica*; 2276, 2277 – *C. (Ovosoma) wittmeri*.

59. Body not very convex. Species from E Siberia. See *cyaneovinosa*, antithesis 43.
- Body very convex. Species from Mediterranean area and Near East ..... **60**.
60. Elytral punctures strong or very strong, deeply impressed, without violaceous or blackish surrounding. Upper side in typical form with feeble greenish bronzy reflex. Aedeagus as in figs **2278**, **2279**. Variations: metallic reflex of upper side bronzy cupreous (ab. *olivieri* WEISE, 1882), purplish (ab. *praevia* BECHYNÉ, 1950), bluish (ab. *extrita* BECHYNÉ, 1950), green (ab. *comisabunda* BECHYNÉ, 1950) or absent, upper side black (ab. *insulicola* BECHYNÉ, 1950). Length 8.0–10.0 mm. Endemic to Crete ...  
 ..... (*Ovosoma*) ***cretica*** (OLIVIER, 1807).

- Elytral punctures moderately strong, surrounded by violaceous or blackish area. Deep, rather short lateral furrows on pronotum are prolonged anteriad by a stripe of several strong punctures ..... **61.**
- 61. Hind wings strongly reduced. Upper side with bronzy-greenish metallic reflex, feebly shining. Aedeagus as in figs **2280, 2281**. Length 8.0–9.5 mm. Variation: metallic reflex greenish blue (ab. *bythiniensis* BECHYNÉ, 1950). Following forms described as species are only poorly correlated with their reported ranges and are probably only individual or local varieties: lateral margins of pronotum straight (subsp. *thraeissa* BECHYNÉ, 1950, described from northern Greece, occurs also in southern Turkey), punctures of elytra rather sparse, discal series containing about 15 points (subsp. *palaestina* BECHYNÉ, 1950, from Lebanon and Israel), punctures of elytra relatively dense, discal series containing about 20–25 points, lateral margins of pronotum slightly rounded (nominotypical subspecies, from Asia Minor) ..... (*Ovosoma*) ***orientalis*** (OLIVIER, 1807).
- Hind wings longer than elytra ..... **62.**

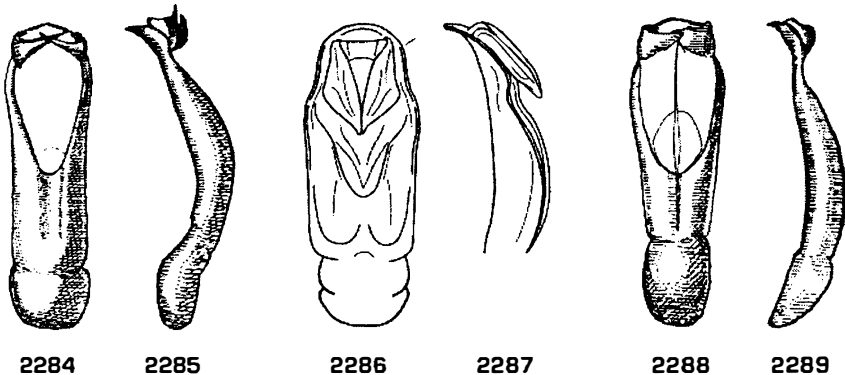


Figs 2278–2283. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 2003): 2278, 2279 – *Chrysolina* (*Ovosoma*) *cretica*; 2280, 2281 – *C. (O.) orientalis*; 2282, 2283 – *C. (O.) halysa*.

- 62. Humeral callus absent, body relatively slender, lateral margins of pronotum distinctly rounded. Aedeagus as in figs **2282, 2283**. Length 7.0–9.0 mm. Remaining characters as in *orientalis* (thesis 15). A few subspecies are described: punctures of elytra fine and sparse, not joined by thin scratches, smaller, 7.0–8.5 mm, pronotum more shining than elytra, at least in male (nominotypical subspecies, from Cyprus, Asia Minor and Syria), as *halysa* s. str., but larger, 8.0–9.0 mm, upper side in both sexes matt (subsp. *assyrica* BECHYNÉ, 1950, from Iraq and Caucasian countries), punctures of elytra dense, joined longitudinally by thin scratches, body relatively slender (subsp. *intercalaria* BECHYNÉ, 1950, from Transcaucasia). Distributed in Cyprus, Asia Minor, Caucasian countries and Near East ..... (*Ovosoma*) ***halysa*** BECHYNÉ, 1950.
- Humeral callus feebly developed but distinct, body short oval, lateral margins of pronotum almost straight. Length 8.5–9.5 mm. Variations: upper side greenish



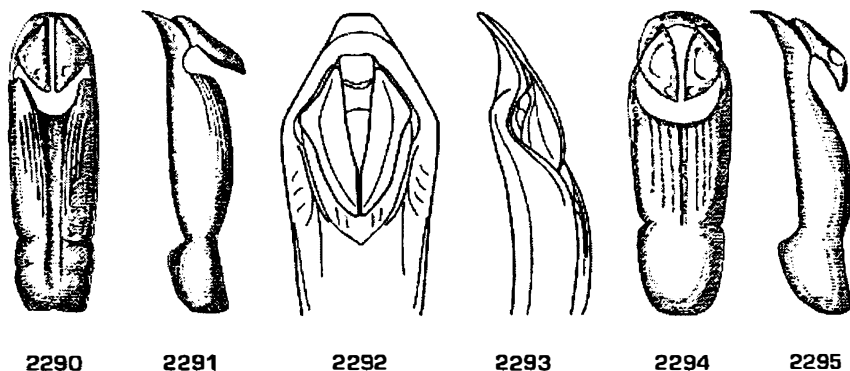
- bronzy (typical form), upper side black with feeble bluish reflex (ab. *bleusei* BECHYNĚ, 1950). Endemic to Rhodos, perhaps a local form of *halysa* (thesis 16) ..... (Ovosoma) ***rhodia*** BECHYNĚ, 1950.
63. On elytra puncture rows equidistant (as in *valichanovi*, thesis 47) ..... **64.**  
 - On elytra puncture rows geminate ..... **94.**
64. Species from Asia Minor. On elytra intervals never elevated. Body black with feeble metallic bronzy reflex. Aedeagus as in figs **2276**, **2277**. Length 6.0–7.0 mm. Distributed in mountains of Asia Minor ..... (Ovosoma) ***wittmeri*** MEDVEDEV, 1975.  
 - Species from Central and NE Asia. On elytra alternate intervals often elevated or even ridge-shaped. Here 18 species grouped into the subgenera *Arctolina* KONTKANEN, 1959 and *Pleurosticha* MOTSCHULSKY, 1860. Their characteristics are cited mainly after BIEŃKOWSKI (1999, 2004) ..... **65.**
65. Apical borders of aedeagus born two large, protuding dorsally alae (subg. *Pleurosticha* MOTSCHULSKY) ..... **66.**  
 - Apical borders of aedeagus don't born large alae (subg. *Arctolina* KONTKANEN) .... **74.**
66. Primary punctures on elytra arranged in regular, not impressed rows, intervals flat or barely convex ..... **67.**  
 - Rows of primary punctures on elytra impressed, intervals more or less convex. Alae of aedeagus triangular or trapezoidal ..... **68.**



Figs 2284–2289. Aedeagus in dorsal and lateral view (2286, 2287 after MIKHAILOV 2006, remaining after BIEŃKOWSKI 1999): 2284, 2285 – *Chrysolina* (*Pleurosticha*) *gebleri*; 2286, 2287 – *C. (P.) lagunovi*; 2288, 2289 – *C. (P.) latimargo*.

67. Alae of aedeagus (figs **2284**, **2285** narrow, bent. Length 6.0–6.7 mm. Forms two subspecies: upper side dark violaceous, coopry or bronzy. Elytral intervals covered by fine punctures, approximately as strong as on pronotal disc (subsp. *nomi-notypica*), upper side bronzy-green, in basal part of elytra secondary punctures stronger than on pronotal disc (subsp. *sajanensis* MEDVEDEV, 1979). Distributed in Altai (*gebleri* s. str.) and Sayan Mountains (subsp. *sajanensis*) ..... (Pleurosticha) ***gebleri*** MEDVEDEV, 1979.

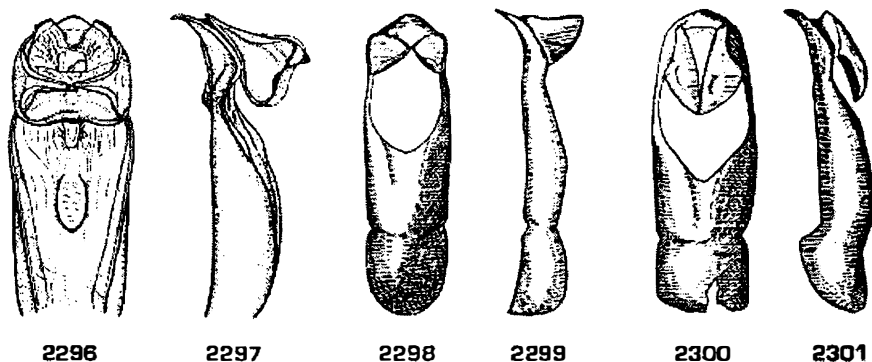
- Alae of aedeagus adpressed. Apex of aedeagus (figs **2302**, **2303**) shortly narrowed, broadly rounded. Upper side silky, finely reticulated, bicolorous: head, pronotum and scutellum greenish, elytra bronzy with weak greenish reflex. Length 7.8 mm. See *tundralis* (thesis 76).
- 68. Head and pronotum black, elytra dark brown, both with bronzy reflex. Pronotum in lateral view convex. Aedeagus as in figs **2288**, **2289**. Length 6.5–7.8 mm (= *changaica* LOPATIN, 1971). Distributed in Mongolia and Baikal Lake environs ..... (*Pleurosticha*) **latimargo** (WEISE, 1896).
- Upper side unicolorous, black with or without metallic reflex ..... **69**.
- 69. In lateral view outline of aedeagus just after alae shallowly emarginate ..... **71**.
- In lateral view outline of aedeagus just after alae deeply emarginate. Upper side dark violaceous or green with violaceous reflex. Two species externally similar to each other ..... **70**.
- 70. Aedeagus as in figs **2290**, **2291**. Length 7.7–8.6 mm. Distributed in S and W Siberia ..... (*Pleurosticha*) **sylvatica** (GEBLER, 1848).
- Aedeagus as in figs **2292**, **2293**. Described from W Siberia (Kuznetzkij Alatau) .... (*Pleurosticha*) **arctoalpina** MIKHAILOV, 2006.
- 71. Species from Arctic Asia ..... **73**.
- Species from Central and Eastern Siberia, Khabarovsk territory and Japan .... **72**.



Figs 2290–2295. Aedeagus or its apical half in dorsal and lateral view (2292, 2293 after MIKHAILOV 2006; remaining after BIENKOWSKI 1999): 2290, 2291 – *Chrysolina (Pleurosticha) sylvatica*; 2292, 2293 – *C. (P.) arctoalpina*; 2294, 2295 – *C. (P.) subcostata*.

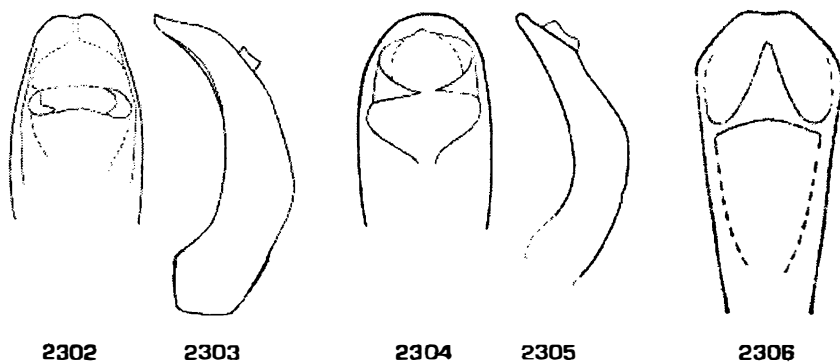
- 72. Upper side black with different metallic shine: violaceous, greenish, coppery, bronzy. Legs and anal sternite usually black, rarely dark reddish brown. Aedeagus as in figs **2294**, **2295**. Length 7.3–8.3 mm (= *pirka* TAKIZAWA, 1970). Distributed in Siberia, Russian Far East and Japan (Hokkaido) ..... (*Pleurosticha*) **subcostata** (GEBLER, 1848).
- Upper side green. Aedeagus as in figs **2296**, **2297**. Length 7.0 mm. Described from W Sayan Mountain ..... (*Pleurosticha*) **uraltuensis** MIKHAILOV, 2000.

73. Aedeagus as in figs **2298, 2299**. Length 5.9–8.0 mm. Distributed in Chukotsk Peninsula, Kamchatka and Alaska ..... (*Pleurosticha*) ***cavigera*** (SAHLBERG, 1887).  
 -. Aedeagus as in figs **2300, 2301**. Length 8.0–8.8 mm (= *rufipes* MÉNÉTRIÉS, 1851, nec LINNAEUS, 1758). Distributed in Arctic Asia, by some authors considered as conspecific with *cavigera* (thesis 73) ..... (*Pleurosticha*) ***tolli*** (JACOBSON, 1910).  
 74. Species from NE Siberia ..... **75**.  
 -. Species from NE Kazakhstan, Altai and NW China ..... **81**.



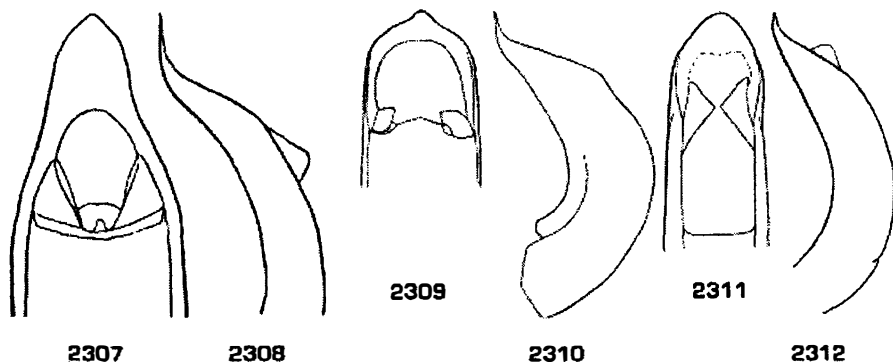
Figs 2296-2301. Aedeagus in dorsal and lateral view (2296, 2297 after MIKHAILOV 2000, remaining after BIEŃKOWSKI 1999): 2296, 2297 – *Chrysolina (Pleurosticha) uraltuensis*; 2298, 2299 – *C. (P.) cavigera*; 2300, 2301 – *C. (P.) tolli*.

75. Apex of aedeagus broadly truncate or rounded, but neither gradually narrowed nor with lamella ..... **76**.  
 -. Apex of aedeagus with apical lamella or projection of various shape ..... **78**.



Figs 2302-2306. Aedeagus or its apical part in dorsal and lateral view (2306 after MEDVEDEV 1982, remaining after BIEŃKOWSKI 2004): 2302, 2303 – *Chrysolina (Pleurosticha) tundralis*; 2304, 2305 – *C. (Arctolina) septentrionalis*; 2306 – *C. (A.) dubeshkoeae*.

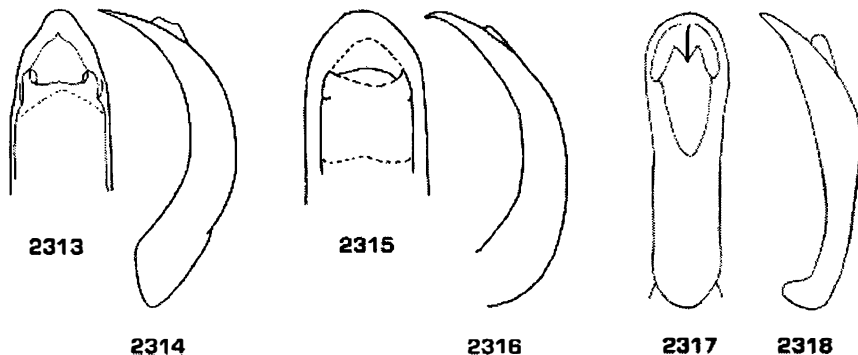
76. Dorsum usually uniformly coloured, with relatively strong shining, with bronzy, greenish or bluish metallic reflex, sometimes bicolorous (pronotum bronzy, elytra greenish). Lateral furrows on pronotum in basal 1/3–1/2 deep, in anterior part shallower. Elytral intervals moderately convex, rarely almost flat ..... 77.
- . Dorsum moderately or feebly shining, sometimes almost mat, metallic reflex-bronzy, greenish bronzy or bluish. Elytral intervals flat or feebly convex. Apex of aedeagus (2302, 2303) transversely cut and very slightly emarginate. Body on average larger, length 5.4–7.0 mm. Distributed in NW Siberia, mainly in basins of Ob and Yenisey ..... (*Arctolina*) **tundralis** (JACOBSON, 1910).
77. Apical part of aedeagus in dorsal view to some extent variable, its outline in different populations as in figs 2304, 2305. Body on average smaller, length 4.8–6.4 mm (= *sculpturata* JACOBSON, 1910, *caurina* BROWN, 1962). Distributed in subpolar zone from N Ural to Alaska ..... (*Arctolina*) **septentrionalis** (MÉNÉTRIÉS, 1851).
- . Externally similar to septentrionalis, Aedeagus as in fig. 2306. Length 4.9–5.8 mm. Described from Transbaikal ..... (*Arctolina*) **dubeshkoeae** MEDVEDEV, 1974.
78. Apex of aedeagus (figs 2307, 2308) narrowed, slightly elongate, somewhat tongue-shaped, gently bent up on elytra intervals 2–9 strongly convex on whole length, costae-shaped, interval 10 in anterior half flattened. Upper side black with very weak bronzy reflex, in male shining, in female semimat or silky. General view as in plate LXII, **phot. 550**. Length 5.3–7.0 mm (male) to 5.7–7.4 mm (female). Distributed on subpolar coasts of Asia between estuary of Yenisey and Kamchatka ..... (*Arctolina*) **bungei** (JACOBSON, 1910).
- . Apex of aedeagus narrowly rounded, often with more or less distinct lamella. Dorsum similar, moderately shining in both sexes ..... 79.



Figs 2307-2312. Apical part of aedeagus in dorsal and lateral view (after BIENKOWSKI 2004): 2307, 2308 – *Chrysolina* (*Arctolina*) **bungei**; 2309, 2310 – *C. (A.) boeberi*; 2311, 2312 – *C. (A.) magniceps*.

79. Aedeagus thick, its apex in lateral view bent dorsally (figs 2309, 2310). Lateral thickenings of pronotum limited by shallow furrow, distinct in basal 1/3–1/2, obsolete anteriorly. Elytral intervals 2–8 moderately, interval 9 stronger convex, interval 10 concave. Upper side green or bronzy, on lateral sides with violaceous

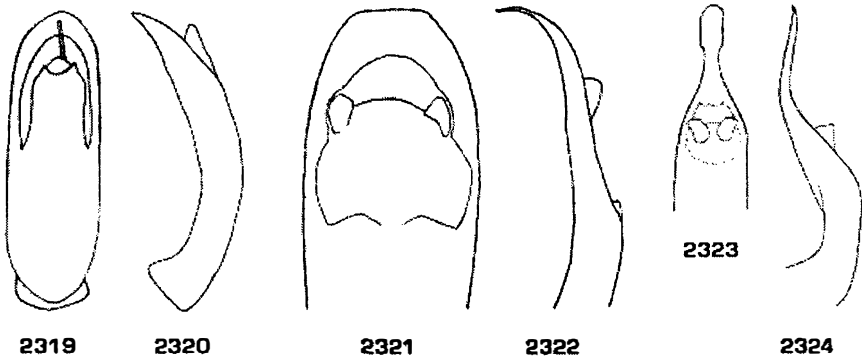
- reflex. Legs black or black with metallic reflex. Length 6.3–6.7 mm (male) to 7.5–7.6 mm (female). Distributed in NE Siberia (Kamchatka, Yakutia, Ochotsk Sea coasts ..... (*Arctolina*) ***boeberi*** (HAROLD, 1874).
- Aedeagus more slender, its apex in lateral view straight or slightly bent ventrally .... **80.**
80. Elytral intervals 3, 5, 7 and 9 strongly elevated, costae-shaped, intervals 2, 4, 6 and 8 flat or evenly convex; sometimes intervals 2–9 evenly convex, interval 10 flat or feebly convex. Lateral thickenings of pronotum limited by narrow furrow, deep in basal 1/3–1/2, shallower anteriorly. Upper side black or black with bluish or greenish reflex, sometimes green. Legs or tarsi only brown. Aedeagus as in figs **2311, 2312**). Length 5.6–7.2 mm (= *birulai* JACOBSON, 1910 partly). Variations: intervals 3, 5 and 7 strongly elevated, remaining rather flat, general view as in plate LXII, **phot. 551**, legs black (var. *wollosowiczi* JACOBSON, 1910), as *wollosowiczi*, upper side more strongly shining, legs metallic (var. *novosibirica* JACOBSON, 1910). Distributed in extreme NE of Asia, from estuary of Lena to Islands of Bering Sea and Alaska ..... (*Arctolina*) ***magniceps*** (SAHLBERG, 1887).
- Elytral intervals 3, 5, 7 rather weakly convex. Aedeagus (figs **2313, 2314**) in lateral view regularly arched. Upper side black, bronzy-green or bluish green, legs coloured variously, dark metallic, brown or reddish. Length 5.7–8.2 mm (= *birulai* JACOBSON, 1910 partly). Variation: similar to *magniceps* var. *wollosowiczi* (thesis 80), legs rusty except for base of femora, apices of tibiae and last 2 tarsomeres blackish, upper side dark bronzy or bronzy-greenish (var. *glacialis* JACOBSON, 1910). Distributed along coasts of Arctic Ocean from North Land to Alaska ..... (*Arctolina*) ***subsulcata*** (MANNERHEIM, 1853).



Figs 2313–2318. Aedeagus or its apical part in dorsal and lateral view (2317, 2318 after LOPATIN 2000, remaining after BIENKOWSKI 2004): 2313, 2314 – *Chrysolina* (*Arctolina*) *subsulcata*; 2315, 2316 – *C. (Pezocrosita) borochoensis*; 2317, 2318 – *C. (P.) daccordii*.

81. Pronotal furrows shallow or indistinct, sparsely covered by more or less distinct punctures. Upper side distinctly reticulated, silky, bronzy or coopery, sometimes bicolorous head and pronotum bronzy, elytra coppery). Three species similar to each other from NW China (Sinkiang, Tibet) ..... **82.**
- Pronotal furrows distinct, in basal part narrow and deep ..... **84.**

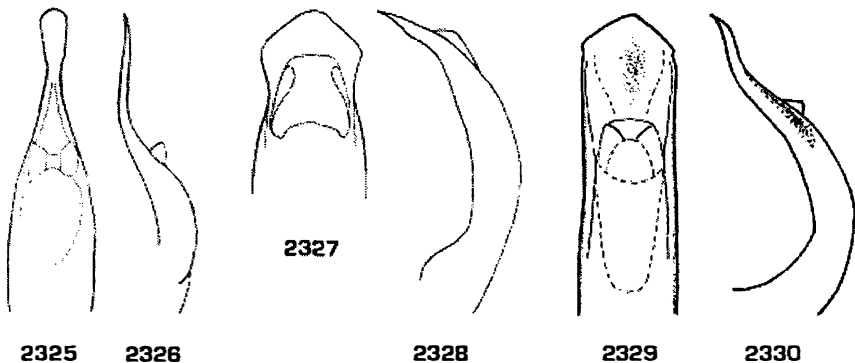
82. Antennae and legs piceous, antennomeres 6–10 gradually broadened. Apex of aedeagus (figs 2315, 2316), on both sides shallowly emarginate, forming a large broad lamella. Length 5.0–6.0 mm (male) to 6.1–6.7 (female). Described from NW China (Sinkiang) ..... (*Arctolina*) ***borochorensis*** LOPATIN, 2000.  
 –. Externally similar to *borochorensis* (thesis 82). Two species similar to each other, distinguishable by aedeagus shape ..... **83**.
83. Smaller. Apex of aedeagus (figs 2317, 2318) regularly rounded. Length 5.0 mm (male) to 5.6–6.0 mm (female). Described from China (E Tian-Shan) ..... (*Pezocrosita*) ***daccordii*** LOPATIN, 2000).  
 –. Aedeagus (figs 2319, 2320) differently shaped. Length 6.3–6.5 mm. Described from Tibet ..... (*Pezocrosita*) ***tekessica*** LOPATIN, 2000.
84. Disc of pronotum finely and sparsely punctured. Elytral intervals flat, impunctate, densely reticulated. Upper side violaceous. Aedeagus not studied. Length about 7.5 mm. Described from Altai ..... (*Arctolina*) ***cyanella*** (GEBLER, 1830).  
 –. Disc of pronotum distinctly and densely punctured. Elytral intervals punctured (when strongly reticulated, punctures hardly visible) ..... **85**.



Figs 2319-2324. Aedeagus or its apical part in dorsal and lateral view (2319, 2320 after LOPATIN 2000, remaining after BIEŃKOWSKI 2004): 2319, 2320 – *Chrysolina* (*Pezocrosita*) *tekessica*; 2321, 2322 – *C.* (*Arctolina*) *teleuta*; 2323, 2324 – *C.* (*A.*) *ballioni*.

85. Lateral thickenings of pronotum broad, lateral margins strongly rounded. Body larger. Upper side violaceous, moderately shining, elytra sometimes silky. Femora and tibiae black with metallic reflex, tarsi piceous, antennae brown, antennomeres 1 and 2 paler. Length 7.2–8.6 mm (male) to 7.7–9.4 mm (female). Distributed in Altai ..... (*Arctolina*) ***teleuta*** (JACOBSON, 1922).  
 –. Lateral thickenings of pronotum narrow, lateral margins weakly rounded. Body smaller. Nine species distinguishable mainly by shape of aedeagus ..... **86**.
86. Aedeagus with long projection broadened apically and narrowed basally ..... **87**.  
 –. Aedeagus with short projection or without any projection, but usually more or less distinct narrowed behind apex ..... **88**.
87. Lateral sides of pronotum distinctly rounded. Upper side in both sexes reticulated, silky, violaceous. Underside and legs pitchy with weak metallic, bronzy reflex. Hind

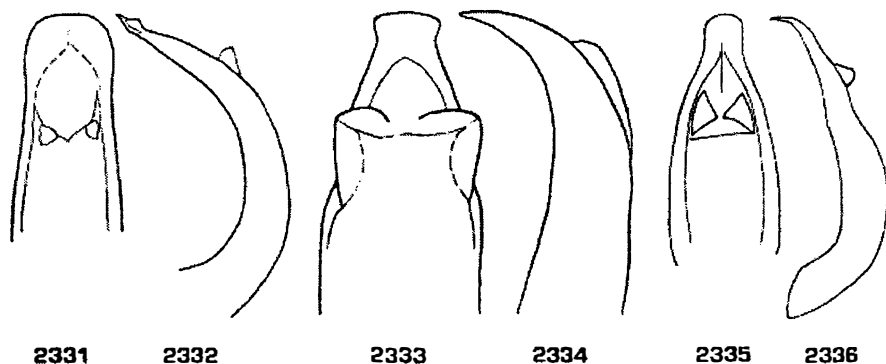
- wings vestigial. Aedeagus as in figs **2323**, **2324**. Length 6.3–6.5 mm (male) to about 7.0 mm (female). Distributed in E Kazakhstan ..... (*Arctolina*) ***ballioni*** (LOPATIN, 1968).
- . Lateral sides of pronotum weakly rounded in anterior half, almost straight in posterior half. Upper side moderately strongly shining (in female silky), dark bronzy with golden reflex, head and pronotum somewhat violaceous, scutellum bluish. Aedeagus as in figs **2325**, **2326**. Length 5.8 mm (male) to 7.0 mm (female). Described from Dzhungarian Ala Tau (E Kazakhstan/NW China) ..... (*Arctolina*) ***dolini*** LOPATIN, 1999.
88. Apex of aedeagus triangular ..... **89**.
- . Apex of aedeagus truncate ..... **90**.
89. Punctures on pronotal disc dense, moderately strong. Elytral intervals strongly convex, costiform in both sexes., finely, distinctly and densely punctate. Upper side black, its lateral borders with bluish reflex. Aedeagus as in figs **2327**, **2328**. Length 5.9 mm (male). Female unknown. Described based on one specimen only from Altai ..... (*Arctolina*) ***oirota*** LOPATIN, 1990.
- . Punctures on pronotal disc very fine. Elytral intervals convex but not costiform, sparsely and very finely punctate. Upper side dark bronzy with golden reflex. Hind wings absent. Aedeagus as in figs **2329**. Length 7.0 mm (male) to 7.5 mm (female). Described from Dzhungarian Ala Tau (E Kazakhstan) ..... (*Arctolina*) ***kaikana*** LOPATIN, 1992.



Figs 2325-2330. Apical part of aedeagus in dorsal and lateral view (after BIENKOWSKI 2004): 2325, 2326 – *Chrysolina* (*Arctolina*) *dolini*; 2327, 2328 – *C. (A.) oirota*; 2329, 2330 – *C. (A.) kaikana*.

90. Apical part of aedeagus almost parallel-sided. Upper side bluish-black, moderately shining or with elytra mat, finely reticulated. Antennae dark brown or rusty-brown, underside and legs black. Aedeagus as in figs **2331**, **2332**. Length 5.5 mm (male) to 6.6 mm (female). Described from Dzhungarian Ala Tau (E Kazakhstan) ..... (*Arctolina*) ***kryzhanovskii*** (LOPATIN, 1968).
- . Apical part of aedeagus distinctly narrowed before apex ..... **91**.
91. Operculum of aedeagus with large lateral broadenings. Upper side black with greenish metallic reflex, elytra in posterior 2/3 sometimes with violaceous hue.

- Surface moderately shining, in female stronger reticulated, somewhat silky. Legs black, antennae piceous. Aedeagus as in figs **2333**, **2334**. Length 5.6–6.4 mm (male) to 6.7–7.0 mm (female). Described from E Kazakhstan ..... (Arctolina) *saurica* (JACOBSON, 1924).
- . Operculum of aedeagus without lateral broadenings ..... **92**.
92. Femora and tibiae brown, tarsi and antennae rusty. Body black with bronzy reflex. Aedeagus in lateral view somewhat wavy. See *valichanovi*, thesis 47).
- . Femora and tibiae black, antennae dark brown to pitchy ..... **93**.
93. Apex of aedeagus (figs **2335**, **2336**) in lateral view strongly bent down. Upper side black with bronzy or coopery-violaceous metallic reflex. Elytral intervals 3, 5, 7 and 9 strong convex, costiform. Length 6.1 mm (male) to 6.6 mm (female). Described from Dzhungarian Ala Tau (E Kazakhstan) ..... (Arctolina) *octocosta* (JACOBSON, 1924).
- . Apex of aedeagus (figs **2319**, **2320**) almost straight. Upper side violaceous or bluish-violaceous. Elytral intervals convex, partly costiform on apical sloping in female only. Length 6.3 mm (male) to 7.4 mm (female). Described from Dzhungarian Ala Tau (E Kazakhstan) ..... (Arctolina) *tastavica* LOPATIN, 1992.
94. Hind wings absent. Lateral sides of pronotum rounded, on elytra intervals very finely punctulate. Aedeagus not studied. Length 5.0–6.0 mm (= *circassicola* REITTER, 1912). Distributed in western Caucasus. Here somewhat stronger punctured specimens of *abchasica* (auxiliary group F, antithesis 7).
- . Hind wings present ..... **95**.



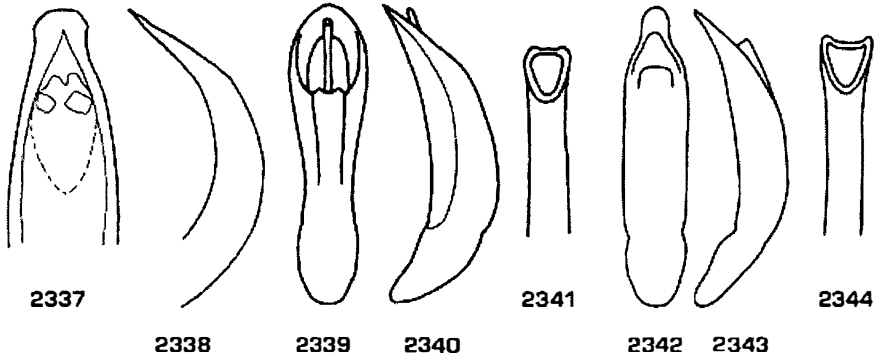
Figs 2331-2336. Apical part of aedeagus in dorsal and lateral view (after BIENKOWSKI 2004): 2331, 2332 – *Chrysolina* (Arctolina) *kryzhanovskii*; 2333, 2334 – *C. (A.) saurica*; 2335, 2336 – *C. (A.) octocosta*.

95. W Palaearctic species ..... **96**.
- . Asiatic species distributed between Altai and Japan ..... **103**.
96. Lateral furrow on pronotum very shallow and short (about 1/4 of pronotum length). See also *hyperici daghestanica*, thesis 21. Body rather short and broad. Upper side finely reticulate, uniformly coloured, black with rather feeble, bronzy, greenish or blue metallic reflex. Secondary punctures rather scarce and very fine, but always



well perceptible. Aedeagus as in figs **2339–2341**. Variation: upper side with strong, green, metallic sheen (ab. *eviridis* BECHYNÉ, 1950). Length 5.5–8.0 mm (= *quinquejugis* MARSHAM, 1802). Area of distribution divided into two or three subareas: **1.** Balkans, Asia Minor, Caucasian countries and Near East; **2.** France and western Germany; probably also: **3.** Hungary and Slovakia. From Near East two subspecies are described: body smaller (5.5–7.0 mm), metallic reflex of upper side bronzy or cupreous-olive, apical part of aedeagus slightly spoon-like broadened (subsp. *syriaca* WEISE, 1884), body more slender, metallic reflex of upper side bluish-violaceous (subsp. *elongatior* BECHYNÉ, 1952). Nominotypical subspecies occurs in all remaining parts of area .....

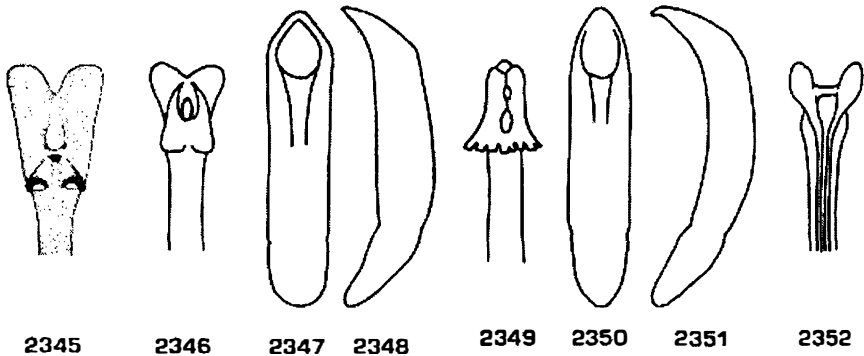
- Lateral furrow on pronotum deeply impressed and longer (about 1/3 of pronotum length) ..... **97**.
- 97. Second entire row on elytra composed of 13–19 punctures. Here two species, whose unambiguous identification requires examination of aedeagus ..... **98**.
- Second entire row on elytra composed of at least 22 punctures ..... **100**.



Figs 2337–2344. Aedeagus or its apical part in dorsal and lateral view; flagellum (2337, 2338 after BIENKOWSKI, remaining after WARCHALOWSKI 1993): 2319, 2320 – *Chrysolina (Arctolina) tastavica*; 2339–2341 – *C. (Hypericia) didymata*; 2342–2344 – *C. (H.) hyperici*.

- 98. Flagellum as in figs **1411**. Upper side black with metallic reflex, ground of pronotum and elytra reticulate. General view as in plate LXII, **phot. 552**. Aedeagus as in figs **2342–2344**. Length 5.5–7.0 mm (= *fuscata* FABRICIUS, 1781, *gemellata* GEOFFROY, 1785). Variations: metallic reflex of upper side cupreous-greenish (typical form), green (ab. *viridula* LAICHARTING, 1781), bluish or violaceous (ab. *ambigua* WEISE, 1884), absent, upper side black (ab. *privigna* WEISE, 1884). In Caucasian countries forms a local race: externally very similar to *didymata* (thesis 19). Lateral furrow on pronotum very short and shallow (subsp. *daghestanica* REITTER, 1912). Distributed in southwestern England and in almost whole continental Europe approximately to 60<sup>th</sup> parallel ..... (*Hypericia*) **hyperici** (FORSTER, 1771).
- Flagellum differently shaped ..... **99**.

99. Flagellum as in fig. 2345. External characters and body length as in *hyperici* (thesis 98). Described from Asia Minor (Taurus Mountains), erroneously reported also from Bulgaria ..... (*Hypericia*) ***anatolica*** (DAHLGREN, 1984).
- . Flagellum as in fig. 2346. External characters and body length as in *hyperici* (thesis 21) (= *alternata* SUFFRIAN, 1851, *indigena* WEISE, 1884, *normandi* BECHYNÉ, 1949). Distributed in Algeria, Iberian Peninsula, Italy, Dalmatia, Austria and Switzerland. In 19th century repeatedly encountered in eastern and northern Germany ..... (*Hypericia*) ***quadrigemina*** (SUFFRIAN, 1851).
100. Upper side with strong metallic gloss. Secondary punctures of elytra very distinct, rather irregular, primary punctures partly masked. Usually head and pronotum dark green or dark bronzy-green, elytra cupreous or purplish, rarely bronzy-black. Antennomera 1–4 reddish. General view as in plate LXII, **phot. 553**. Aedeagus as in figs 2347–2349. Length 5.5–6.5 mm (= *duplicata* ZENKER, 1815). Variation: upper side uniformly golden-green (ab. *hol-sastica* BECHYNÉ, 1952). Distributed in southern England, Danmark, northern France, Germany, Austria and western Poland. Second areal involves Pyrenees and neighbouring areas ..... (*Hypericia*) ***brunsvicensis*** (GRAVENHORST, 1807).
- . Metallic reflex of upper side rather feeble, elytra and pronotum very finely reticulate. Here also two species, whose unambiguous identification requires examination of aedeagus ..... **101.**

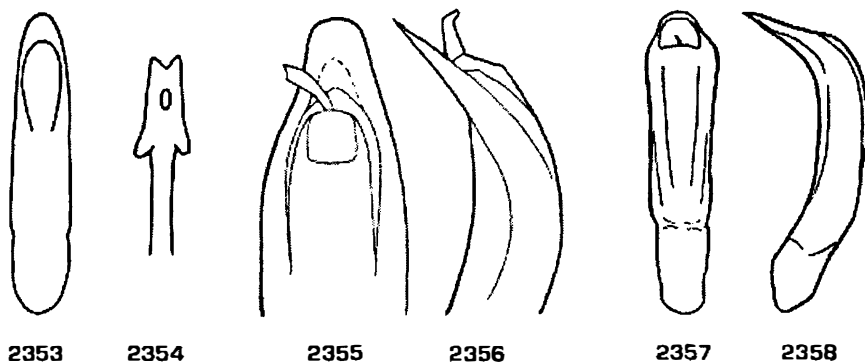


Figs 2345–2352. Aedeagus dorsal and lateral view; flagellum (2345 after DAHLGREN 1984, remaining after WARCHALOWSKI 1993): 2345 – *Chrysolina* (*Hypericia*) *anatolica*; 2346 – *C. (H.) quadrigemina*; 2347–2349 – *C. (H.) brunsvicensis*; 2350–2352 – *C. (H.) geminata*.

101. Posterior angles of pronotum almost rectangular. In 9. row interstices usually as great, as diameter of punctures. Externally very similar to *cuprina* (antithesis 101) ..... **102.**
- . Posterior angles of pronotum obtuse. In 9. row of interstices usually twice greater than diameter of punctures. Upper side black with metallic reflex, usually blue, cupreous or bronzy. General view as in plate LXII, **phot. 554**. Aedeagus as in figs **2353, 2354**. Length 5.5–7.0 mm. Variations: upper side uniformly coloured, me-

tallic reflex bronzy-cupreous (typical form), green (ab. *quadrigemina* SUFFRIAN, 1851), greenish-blue (ab. *indigena* WEISE, 1884), purplish-cupreous (ab. *hypericicola* ŠPRINGLOVA, 1945), violaceous (ab. *vulgaris* ŠPRINGLOVA, 1945), absent, upper side black (ab. *nigra* REITTER, 1912), upperside bicolorous: pronotum blue, elytra green (ab. *semiviridis* ŠPRINGLOVA, 1945), pronotum blue, elytra violaceous (ab. *semicoerulea* ŠPRINGLOVA, 1945), pronotum blue, elytra cupreous (ab. *semicuprea* ŠPRINGLOVA, 1945), pronotum cupreous, elytra green (ab. *aeneola* ŠPRINGLOVA, 1945). In discussed area occurs as two subspecies: on elytra rows 6–9 equidistant (subsp. *staneki* BECHYNĚ, 1949, from Turkey), on elytra all rows geminate (nominotypical subspecies, from remaining parts of area). Distributed in Europe, mostly in mountains of central part of continent. Reports from Russia, Balkans, Scandinavia and Ukraine pertain probably *geminata* .....

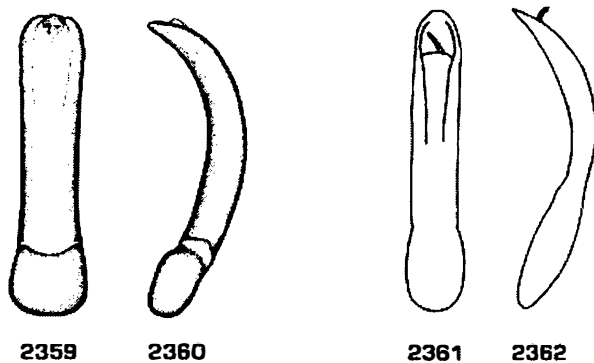
- ..... (*Hypericia*) ***cuprina*** (DUFTSCHMID, 1825).  
 102. On average smaller and more slender, humeral calli slightly marked. Aedeagus as in figs 2350, 2351, flagellum as in fig. 2351. Length 6.0–8.0 mm (= *approximata* ZENKER, 1815, *bifoveolata* BRANCSIK, 1910). Distributed in Europe from Pyrenees and Norway to Lithuania, Ukraine and Bulgaria .....
- ..... (*Hypericia*) ***geminata*** (PAYKULL, 1799).  
 -. On average larger, broader, humeral calli rounded. Aedeagus shape and flagellum as in *geminata* (thesis 102). Considered as distinct species, but possibly a Mediterranean race of *geminata*. Distributed in Sicily, Italy, Corfu and Greece .....
- ..... (*Hypericia*) ***corcyria*** (SUFFRIAN, 1851).



Figs 2353-2358. Aedeagus or its apical part in dorsal and lateral view; flagellum (2353, 2354 after WAR-  
 CHAŁOWSKI 1993; 2355, 2356 after LOPATIN 2000; 2357, 2358 after TAKIZAWA 1970): 2353, 2354 – *Chrysolina*  
 (*Hypericia*) *cuprina*; 2355, 2356 – *C. (H.) difficilis*; 2357, 2358 – *C. (H.) nikkoensis*.

103. Small species, length of body 5.0 mm. Upper side purplish-blue, shining. Lateral thickenings of pronotum in the middle not separated from disc, disc apparently impunctate. Described from Tibet, based on one specimen (sex not determined) only; aedeagus not studied .....
- ..... (*Hypericia*) ***medogana*** CHEN et WANG, 1981.  
 -. Larger species, length of body over 6.0 mm ..... **104.**

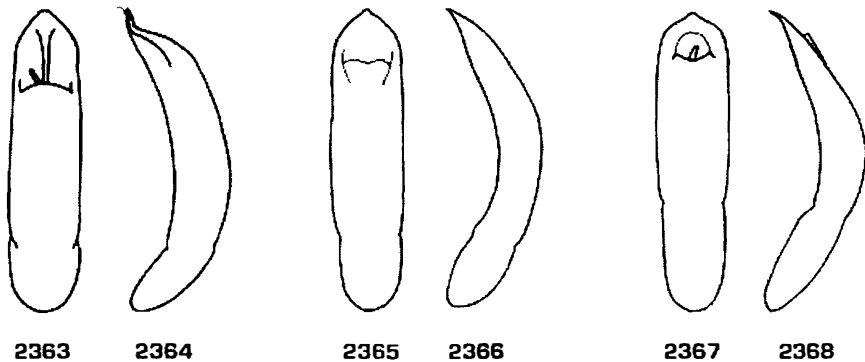
104. Body elongate, somewhat similar to *aeruginosa* (thesis 120), upper side with violaceous tinge, primary punctures strong. Outline of aedeagus as in figs 2355, 2356. Forms three subspecies: smaller (5.5–6.0 mm), violaceous tinge of upper side distinct (subsp. nominotypical from Altai and Sayan), larger (6.0–7.5 mm), body moderately elongate (subsp. *ussuriensis* JACOBSON, 190 = *pubitarsis* BECHYNÉ, 1950 from basin of Amur), large (8.0–9.0 mm) and more strongly elongate (subsp. *yezoensis* MATSUMURA, 1911 = *nikinoja* BECHYNÉ, 1950 = *pseudogeminata* BECHYNÉ, 1950 = *exgeminata* BECHYNÉ, 1952 = *shikokensis* NAKANE, 1963, from NE China, Korea, Sakhalin and Japan) ..... (*Hypericia*) ***difficilis*** (MOTSCHULSKY, 1860).
- . Body not elongate. Upper side black with weak bluish or bluish-violaceous, more rarely bronzy reflex. Disc of pronotum smooth, impunctate. Primary punctures on elytra strong, dense, arranged in geminate rows. Secondary punctures on intervals sparsely scattered. Aedeagus not studied. Length 6.0–6.5 mm. Distributed in Japan, E China and N Indochina ..... (*Hypericia*) ***nikkoensis*** (JACOBY, 1885).
105. Furrow limiting hind part of lateral border of pronotum very short. Pronotum narrowed posteriad. Underside and upper side black. Primary punctures on elytra arranged in almost regular rows. Aedeagus as in figs 2359, 2360, flagellum bifurcate. Length 7.4 mm. Described from Hungary, based on one male specimen only ..... (*Bechynia*) ***substrangulata*** BOURDONNÉ 1986.
- . Furrow limiting hind part of lateral border of pronotum not particularly short. Pronotum narrowed anteriad ..... **106.**



Figs 2359-2362. Aedeagus in dorsal and lateral view (2359, 2360 after BOURDONNÉ 1986; 2361, 2362 after BECHYNÉ 1949): 2359, 2360 – *Chrysolina (Bechynia) substrangulata*; 2361-2362 – *C. (Allochrysolina) lepida*.

106. Furrow limiting hind part of lateral border of pronotum present, but affected by punctures ..... **107.**
- . Furrow limiting hind part of lateral border of pronotum replaced by a punctured impression or by a stripe of points ..... **108.**

107. On elytra primary punctures partly masked by strong secondary punctures. Here aberrations of *carnifex* (group D, thesis 20) without red elytral borders.
- On elytra secondary punctures very fine, primary punctures not masked. Upper side with dark bronzy metallic reflex. Lateral margins of pronotum straight or almost straight, convergent anteriorly. Aedeagus as in figs **2361**, **2362**. Length 6.3–8.5 mm. Forms two subspecies: lateral stripe on pronotum composed of moderately strong punctures; body more slender (nominotypical subspecies), lateral stripe on pronotum composed of fine punctures; body more stout (subsp. *gastoni* FAIRMAIRE, 1875). Distributed in western part of Mediterranean area: southern France, Italy, Iberian Peninsula (*lepida* s. str.) and northwest Africa (subsp. *gastoni*) ..... (*Allochrysolina*) ***lepida*** (OLIVIER, 1807).
108. Short furrow limiting hind part of lateral border of pronotum replaced by a impression ..... **109**.
- Short furrow limiting hind part of lateral border of pronotum replaced by a stripe of punctures ..... **110**.
109. On elytra primary punctures fine and dense. Here colour aberration of two Moroccan species *villersi* and *superstes* (see group D, thesis and antithesis 35).
- On elytra primary punctures very strong and sparse. Body black or black with blue metallic reflex, sometimes epipleura brown or dark red. Lateral border of pronotum strongly punctate, separated from central part by a shallow furrow covered by strong punctures. Aedeagus not studied. Length 8.0–9.0 mm. Probably endemic to Sardinia and Corsica, reported also from Italy and southern Spain .....  
..... (*Stichoptera*) ***stachydis*** (GENÉ, 1839).

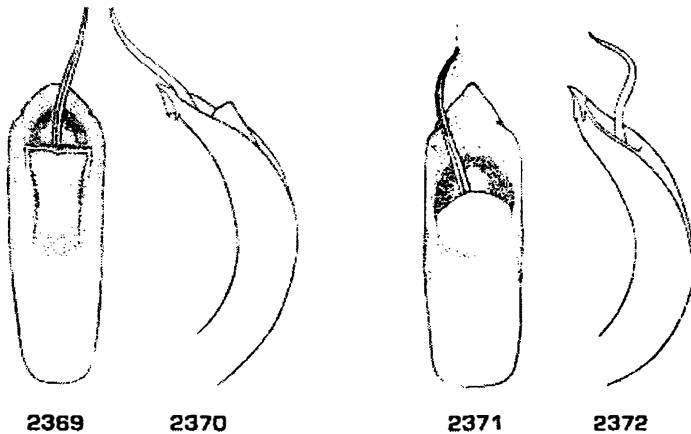


Figs 2363-2368. Aedeagus in dorsal and lateral view (2367, 2368 after BECHYNÉ 1950, remaining after WARCHAŁOWSKI 2003): 2363, 2364 – *Chrysolina* (*Taeniochrysea*) *americana*; 2365, 2366 – *C. (Chrysolinopsis) gemina*; 2367, 2368 – *Chrysolina (Centoptera) bicolor*.

110. Primary punctures of elytra dense (about 50 punctures in row 3), arranged in strongly geminate rows. Alternate intervals differently coloured (usually narrow interval greenish-blue and broad intervals golden). Lateral borders of pronotum barely thickened, separate from central part by broad stripe of deep and strong punctures. General view as in plate LXII, **phot. 555**. Aedeagus as in figs **2363**,

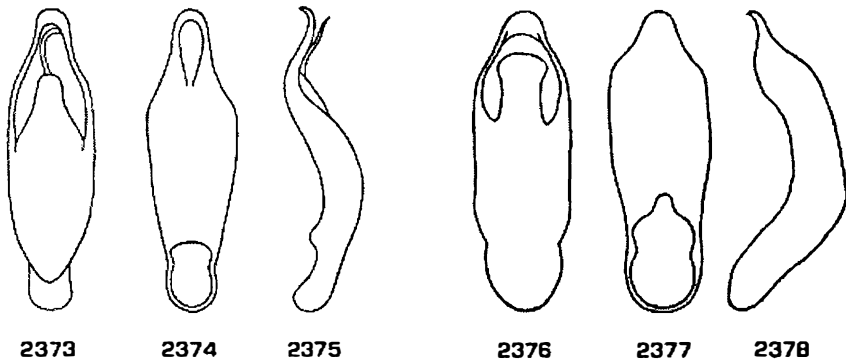
**2364.** Length 7.0–8.0 mm (= *barbarica* GMELIN, 1790, *decemstriata* GOEZE, 1777, *nitidula* FOURCROY, 1785). Variations: upper side cupreous-brown with golden stripes (ab. *lesinae* WEISE, 1884), on pronotum two longitudinal purplish stripes, on elytra narrow intervals purplish, broad intervals blue (ab. *ubertini* MARSEUL, 1887), on elytra narrow intervals golden-green, broad intervals red or purplish (ab. *desdoueti* MARSEUL, 1887). Distributed in whole basin of Mediterranean Sea. Erroneous reports from Central Europa concern *cerealis* (group G, antithesis 11) ..... (*Taeniochrysea*) ***americana*** (LINNAEUS, 1758).

- . Primary punctures of elytra sparse (12–25 punctures in row 3) ..... **111.**
- 111. Upper side dark reddish brown or greenish with rather feeble metallic sheen, elytra strongly shining, primary rows geminate, very loose, fine or moderately strong, punctures not surrounded with violaceous area. Lateral margins of pronotum barely thickened, limited by a stripe of sparse, fine pointsw. Aedeagus as in figs **2365, 2366.** Length 7.5–8.5 mm (= *nitens* BRULLÉ, 1838). Endemic to Canarian Islands ..... (*Chrysolinopsis*) ***gemina*** (BRULLÉ, 1838).
- . Upper side bronzy, greenish bronzy or green, on elytra each puncture surrounded by a violaceous or blackish area. On pronotum both longitudinal stripes composed of very strong punctures. General view as in plate LXII, **phot. 556.** Aedeagus as in figs **2367, 2368.** Length 9.0–12.0 mm (= *regalis* OLIVIER, 1807, *canariensis* BRULLÉ, 1838). Variations: upper side golden-green, punctures surrounded by violaceous or purplish area (ab. *consularis* ERICHSON, 1841), upper side blue-black or dark violaceous, punctures surrounded by dark cupreous area (ab. *dolorosa* FAIRMAIRE, 1873), pronotum and underside violaceous or dark blue, ground colour of elytra greenish-blue (ab. *nigropunctata* REITTER, 1872), underside golden-green, upper side matt, ground colour of elytra bronzy (ab. *mima* MARSEUL, 1887). Distributed in Canarian Islands, northwestern Africa, Iberian Peninsula, Sicily, Malta and southern Balkan Peninsula ..... (*Centoptera*) ***bicolor*** (FABRICIUS, 1775).



Figs 2369–2372. Aedeagus in dorsal and lateral view (after LOPATIN 1988): 2369, 2370 – *Chrysolina* (*Pezocrosita*) *helenae*; 2371, 2372 – *C. (P.) glebi*.

112. Body large, length over 10.0 mm. Upper side very finely reticulated. Lateral thickenings of pronotum separated from disc by strong, but rather shallow punctures, in basal part additionally by a shallow impression. Disc uniformly covered by moderately strong and not very dense puncturation. Humeral callus absent, shoulders of elytra gently rounded. Primary puncturation of elytra arranged in somewhat irregular, not everywhere geminate rows. Intervals covered by distinct, much finer puncturation. In male all tarsi broadened, their underside entirely covered by porous sole. In female first tarsomere of all tarsi with shortened, bare median line. Two species from Tian-Shan, similar to each other ..... **113.**
- Body smaller, length under 9.0 mm ..... **114.**
113. Tarsi and antennae blackish, lateral sides of pronotum gently rounded. General view as in plate LXII, **phot. 557**. Aedeagus as in figs **2369, 2370**. Length 10.0–12.0 mm. Distributed in Tian-Shan .... (*Pezocrosita*) ***helenae*** (LOPATIN, 1968).
- Tarsi and antennae rusty-reddish, lateral sides of pronotum more strongly rounded. Aedeagus as in figs **2371, 2372**. Described from Tian-Shan ..... (*Pezocrosita*) ***glebi*** LOPATIN, 1988.

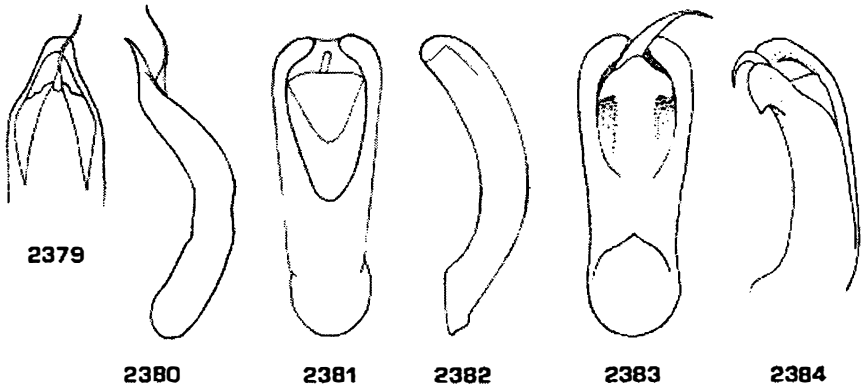


Figs 2373-2378. Aedeagus in dorsal, ventral and lateral view (after LOPATIN 1998): 2373-2375 – *Chrysolina* (*Chalcoidea*) *immarginata*; 2376-2378 – *C. (C.) dieckmanni alaiensis*.

114. Lateral thickening of pronotum in anterior part not broader than in the middle. Lateral sides strongly rounded and converging anteriorly. Upper side black with bronzy-coppery shine, antennae brown, two basal antennomeres black with metallic reflex. Hind wings and humeral calli absent. Rows of primary punctures on elytra not very distinctly geminate, in outer rows punctures large, their diameter almost as broad as interspaces. Length about 9.0 mm (= *micans* JACOBY, 1892). Insufficiently studied species, aedeagus unknown. Ranked in the subgenus *Allohypericia*, but incertae generis. Described from E China ..... (? *Allohypericia*) ***stalii*** (BALY, 1862).
- Not as above ..... **115.**
115. Apical part of aedeagus (figs **2373–2375**) elongated and narrowed. Upper side black or black with bronzy reflex. Epipleura and marginal interval of elytra so-

metimes dark pitchy-red. Antennae slightly gradually thickened towards apex. Lateral thickenings of pronotum at base narrower, broader anteriorly, separated from disc by coarse punctures, in basal part fused into a short, more or less deep furrow, disc covered by fine reticulation and fine or moderately fine puncturation. Geminate rows of punctures on elytra distinct, reaching almost to apex. In male tarsi strongly broadened. In female first tarsomere in all tarsi with broad, bare stripe on underside. General view as in plate LXII, **phot. 558**. Length 7.0–9.0 mm (= *unicolor* GEBLER, 1855, nec MARSHAM, 1802, nec SUFFRIAN, 1851). Distributed in Tian-Shan ..... (*Chalcoidea*) ***immarginata*** (RYBAKOV, 1884).

- Apical part of aedeagus either narrowed, but at most very shortly elongated or in general outline almost transversely cut ..... **116**.
- 116. Apical part of aedeagus approximately triangularly narrowed, apex obtusely rounded. Pronotum broadest before midlength. Upper side black with greenish reflex. Remaining external characters as in *immarginata* (thesis 115), Aedeagus as in figs **2376–2378**. Length 6.5 mm (male) to 7.2 mm (female). One subspecies, *alaisensis* LOPATIN, 1998, externally also very similar to *immarginata*, was described from Tian-Shan. Species described from NW China; reported and also, perhaps erroneously, from basin of Amur ..... (*Chalcoidea*) ***dieckmanni*** MOHR, 1966.
- Apex of aedeagus differently shaped ..... **117**.



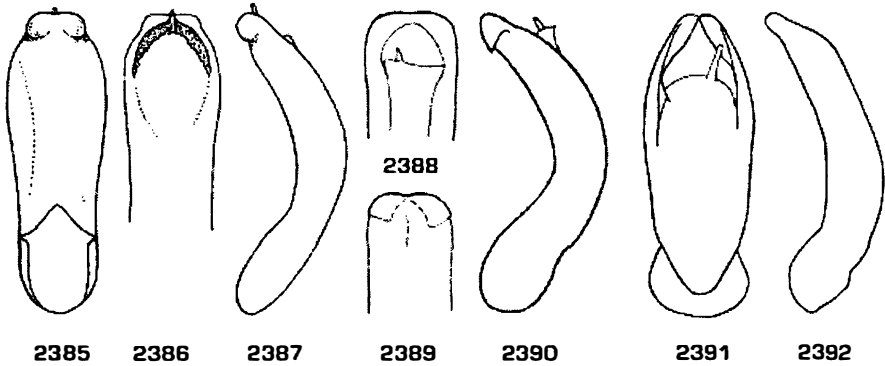
Figs 2379-2384. Aedeagus in dorsal and lateral view (2379, 2380 after BIENKOWSKI 2001; 2381, 2382 after LOPATIN 1970; 2383, 2384 after MOHR 1966): 2379, 2380 – *Chrysolina* (*Chalcoidea*) *dieckmanni*; 2381, 2382 – *C. (Allohypericia.) purpurata*; 2383, 2384 – *C. (A.) perforata*.

- 117. Apex of aedeagus obtuse, transversely thickened, usually with weak emargination in the middle ..... **118**.
- Apex of aedeagus differently shaped ..... **121**.
- 118. Pronotum broadest at base, lateral sides converging anteriorly, barely rounded, sometimes almost straight ..... **119**.
- Lateral sides of pronotum not converging anteriorly, less or more rounded, upper side with distinct or strong metallic shine ..... **120**.



119. Hind wings present. In male hind tarsomere 1 as broad as 3. Externally very similar to *perforata* (antithesis 119). Aedeagus as in figs **2381**, **2382**. Length 6.8–7.7 mm (= *campestris* WEISE, 1912) ..... (*Allohypericia*) ***purpurata*** (FALDERMANN, 1833).
- Hind wings absent. In male hind tarsomere 1 broader than 3. Length 6.5–7.6 mm. Forms three subspecies: upper side mostly purplish-violaceous or violaceous, elytra with rows of large, foveiform, very dense punctures, larger than in remaining subspecies. (subsp. *turczaninoffi* HAROLD, 1875), upper side mostly green or bluish-green, usually with bluish suture and surroundings of punctures, legs black with metallic reflex. General view as in plate LXIII, **phot. 559**. Aedeagus as in figs **2383**, **2384** (subsp. *nominotypica*); as subsp. *nominotypica*, but aedeagus somewhat different and legs sometimes reddish-brown (subsp. *simillima* MOHR, 1966 = *changaiensis* MEDVEDEV, 1980, *pallidipes* MEDVEDEV, 1980). Distributed in Sayan Mts., northern and western Mongolia, Irkutsk region and Transbaikalia ..... (*Allohypericia*) ***perforata*** (GEBLER, 1830).
120. Antennae slender, antennomeres 9–10 longer than broad. Upper side black or black with (usually very weak) metallic reflex. Aedeagus as in figs **2385–2387**. Length of nominotypical subspecies 5.5–7.0 mm (= *dimidiata* MÉNÉTRIÉS, 1836, *instructa* MOTSCHULSKY, 1860, *regularis* MOTSCHULSKY, 1860, *tarda* MOTSCHULSKY, 1860, *distans* CSIKI, 1901). The species is characterized by great individual and geographical variability; in eastern part of distribution area forms several subspecies: elytra in male shining, in female matt, puncturation in both sexes similar, metallic reflex of upper side bronzy (subsp. *muralis* CSIKI, 1901 from Tibet; as in *muralis*, but elytral puncturation of elytra in female much more feeble, in male upper side weakly shining (subsp. *chingana* BECHYNÉ, 1952, from N China); as in *chingana*, but upper side in male strongly shining (subsp. *nominotypica*), elytra in both sexes shining, length over 7.0 mm, lateral impression on pronotum distinct also in anterior part, lateral sides of pronotum almost straight, converging anteriorly (subsp. *poricollis* MOTSCHULSKY, 1860 = *lobicollis* FAIRMAIRE, 1887 = *mandarina* ACHARD, 1922 from NE China); as *poricollis*, but lateral sides of pronotum not straight, upper side with greenish reflex, body stout and convex (subsp. *centralasiae* LOPATIN, 1970 from Mongolia); as *poricollis*, but sides of pronotum rounded (subsp. *peninsularis* BECHYNÉ, 1952 from Korea, by some authors considered as distinct species); length 5.5–6.5 mm, lateral impression on pronotum in anterior part shallow (subsp. *sibirica* WEISE, 1887 from basin of Amur); similar to *sibirica*, but larger, length over 6.5 mm (subsp. *alpina* MEDVEDEV, 1980 from Mongolia). Variations: shine of upper side vivid metallic bronzy (ab. *irregularis* BECHYNÉ, 1952), upper side blue (ab. *rara* BECHYNÉ, 1952). Perhaps here also two insufficiently described species: *Chrysolina* (*Allohypericia*) *zangana* CHEN et WANG, 1981 and *nyalamana* CHEN et WANG, 1981, both from Tibet (= *muralis* CSIKI?). Species s. str. distributed from E Kazakhstan to Russian Far East, NE China and Korea, subspecies distributed as above ..... (*Allohypericia*) ***aeruginosa*** (FALDERMANN, 1835).
- Antennae thick, antennomeres 9–10 shorter than broad. Hind angles of pronotum sharp. Externally similar to *aeruginosa* (thesis 120), but metallic reflex of upper side somewhat stronger, greenish, pronotum sometimes violaceous. Aedeagus shape as in *perforata* (antithesis 119) Length 5.7–7.3 mm. Described from Wrangel Island ..... (*Allohypericia*) ***arctica*** MEDVEDEV, 1980.
121. Primary punctures of elytra strong ..... **122.**
- Primary punctures of elytra fine ..... **123.**

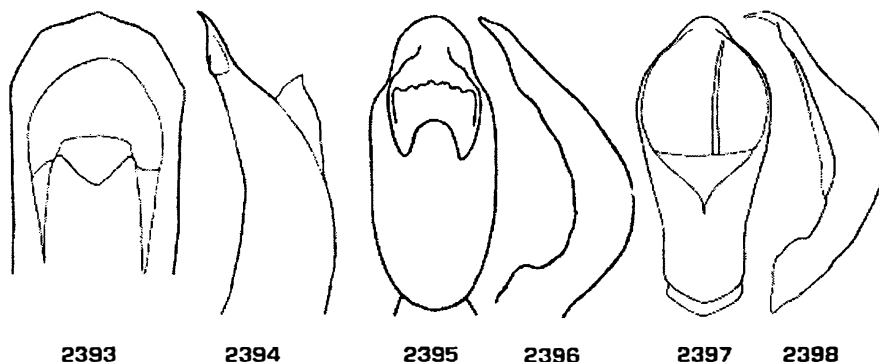
122. Rows of primary punctures moderately strong, confused; dense secondary puncturation covering intervals here and there almost as strong as the primary. Upper side with strong metallic shine, blue, greenish, golden-red or bicolorous. Lateral thickenings of pronotum separated from disc anteriorly by shallow impression with strong punctures and in hind 1/3 by deep furrow. General view as in plate LXIII, **phot. 560**. Aedeagus as in figs **2388–2390**. Length 6.0–8.0 mm. Distributed in Kirghyzstan ..... (*Chrysocrosita*) ***sogdiorum*** (WEISE, 1892).
- . Rows of primary punctures very strong, somewhat irregular, punctures sparse. See *perforata*, antithesis 119).
123. Clypeus covered by strong punctures. Hind wings absent. Body outline oval, slightly broadened in hind part. Upper side moderately shining, black with coppery or bronzy reflex. Legs and antennae black, two basal antennomeres at least on underside reddish. Pronotum in male very finely reticulated and almost smooth, in female distinctly reticulated, somewhat silky, covered by sparse and fine puncturation. Lateral thickenings broad, punctured similarly as disc. Primary punctures fine, arranged in broadly distant rows, not always regular but sometimes having form of thin, jagged furrows. Aedeagus as in figs **2391, 2392**, its apex obtuse and slightly emarginated. General view as in plate LXIII, **phot. 561**. Length about 5.0–6.0 mm. Distributed in Tian-Shan ..... (*Pezocrosita*) ***obovata*** (JACOBSON, 1895).
- . Clypeus finely punctured ..... **124**.



Figs 2385-2392. Aedeagus or its apical part in dorsal, ventral and lateral view (2385-2387 after MOHR 1866, remaining after ЛОРАТИН 1977): 2385-2387 - *Chrysolina (Allohypericia) aeruginosa*; 2388-2390 - *C. (Chrysocrosita) sogdiorum*; 2391, 2392 - *C. (Pezocrosita) obovata*.

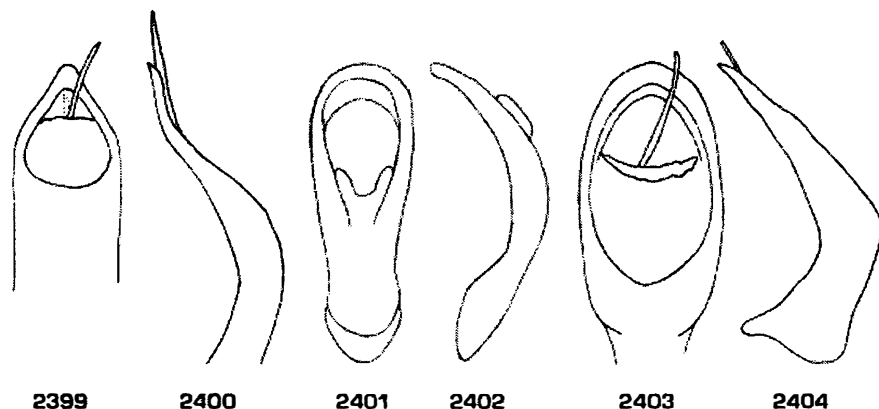
124. Body surface silky, upper side semimatt with bronzy reflex. Apterous, outline of body broadly oval, tibiae distinctly thickened apically ..... **125**.
- . Upper side more or less shining. femora not thickened apically. Several species externally similar to *obovata* (thesis 123), distinguishable mainly by aedeagus-shape ..... **126**.

125. Aedeagus as in figs **2393**, **2394**. Length 6.1 mm. Insufficiently studied species, described from NW China, based on one male only ..... (Pezocrosita) ***przewalskii*** (JACOBSON, 1895).
- . Aedeagus as in figs **2395**, **2396**. Puncturation of elytra fine but distinct and deep, arranged in dense rows, slightly geminate and more weak in hind part. Length 6.5 mm. Described from E Tibet, based on one couple only ..... (Pezocrosita) ***burchana*** LOPATIN, 1998.



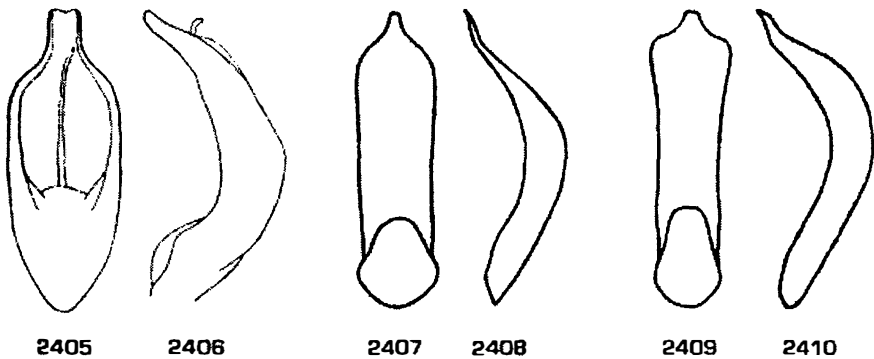
Figs 2393-2398. Tubular part of aedeagus in dorsal and lateral view (2393, 2394 after BIEŃKOWSKI 2001; 2395, 2396 after LOPATIN 1998; 2397, 2398 after LOPATIN 1977): 2393-2394 - *Chrysolina* (*Pezocrosita*) *przewalskii*; 2395, 2396 - *C. (P.) burchana*; 2397, 2398 - *C. (P.) kiritshenkoi*.

126. Body length over 5.5 mm ..... **127.**
- . Small species, body length about 4.5 mm ..... **130.**



Figs 2399-2404. Aedeagus or its apical part in dorsal and lateral view (2399, 2400 after MOHR 1966; 2401, 2402 after LOPATIN 2000; 2403, 2404 after LOPATIN 1988): 2399, 2400 - *Chrysolina* (*Pezocrosita*) *brunnicornis*; 2401, 2402 - *C. (P.) bienkowskii*; 2403, 2404 - *C. (P.) kozłowi*.

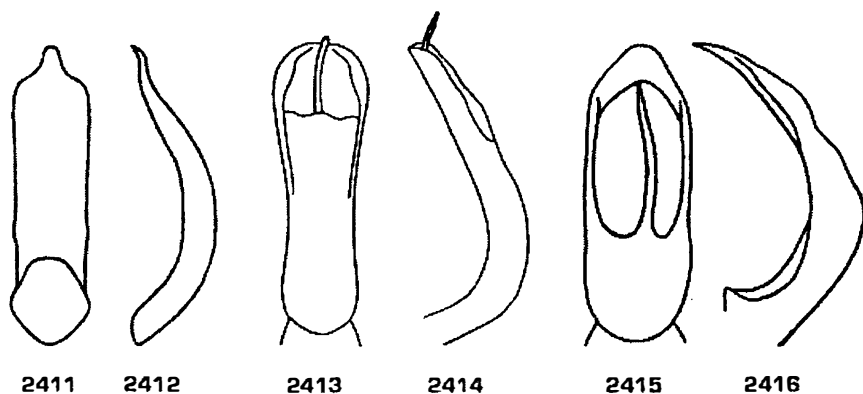
127. Body length under 6.5 mm. Aedeagus not particularly short and broad ..... **128.**  
 -. Body length over 6.5 mm ..... **129.**
128. Aedeagus as in figs **2397, 2398**. Length 6.0 mm. Legs and antennae except two basal antennomeres black. Described from Kirghyzstan .....  
 ..... (*Pezocrosita*) ***kiritshenkoi*** (LOPATIN, 1970).  
 -. Aedeagus as in figs **2399, 2400**. Length about 5.5 mm. Legs and antennae reddish brown. Forms three subspecies: elytral punctures very shallow, almost disappearing, primary rows sometimes somewhat confuse (subspecies nominotypical); elytral punctures distinct, rows regular, intervals flat or very feebly convex, lateral borders of pronotum broad, limited by stripe of moderately strong punctures (subsp. *bermani* MEDVEDEV, 1978); elytral puncturation as in *bermani*, intervals convex, lateral borders of pronotum narrower, in basal part limited by strong punctures (subsp. *vrangeliani* VORONOVA, 1985). Distributed in Altai, Tuva and Mongolia (nominotypical subspecies), Yakutia (ssp. *bermani*) and Wrangel Islands (subsp. *vrangeliani*) ..... (*Pezocrosita*) ***brunicornis*** (WEISE, 1887).
129. Externally similar to *obovata* (thesis 123). Aedeagus as in figs **2401, 2402**, broadest in apical half. Upper side black with weak bronzy reflex, antennae and legs black. Length 6.5 mm (male) to 7.5 mm (female). Described from N China (Kansu) ..... (*Pezocrosita*) ***bienskowskii*** LOPATIN, 2000.  
 -. Aedeagus (figs **2403, 2404**) short and broad, on apex broadly rounded. Upper side dark blackish-green, head and pronotum with very weak violaceous hue. Length 6.7 mm (male) to 6.7–7.0 mm (female). Described from China (Tsinghai) ...  
 ..... (*Pezocrosita*) ***kozlovi*** LOPATIN, 1988.



Figs 2405-2410. Aedeagus in dorsal and lateral view (2405, 2406 after LOPATIN 1977, remaining after VORONOVA 1985): 2405, 2406 – *Chrysolina* (*Pezocrosita*) *mohri*; 2407, 2408 – *C. (P.) lopatini*; 2409, 2410 – *C. (P.) pusa*.

130. Apex of aedeagus with short parallel-sided projection as in figs **2405, 2406**. Length about 4.5 mm. Described from Tian-Shan ... (*Pezocrosita*) ***mohri*** (LOPATIN, 1970).  
 -. Apex of aedeagus differently shaped ..... **131.**
131. Apex of aedeagus (figs **2407, 2408**) with long and narrow lamella. Antennae pale, a few apical antennomeres slightly darker, legs piceous, apices of tibiae

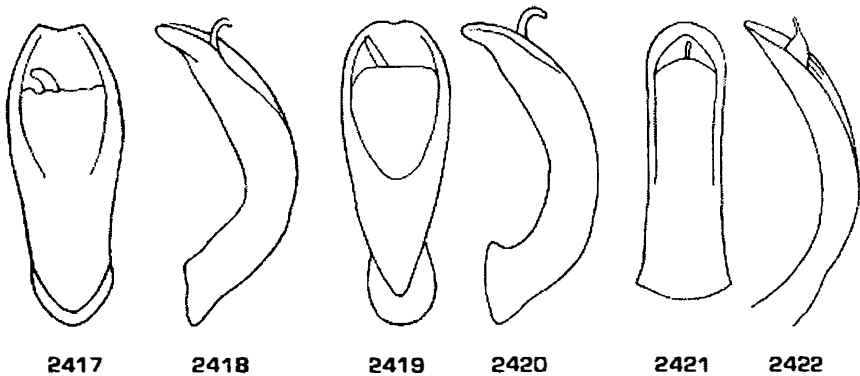
- and tarsi lightened. Length 4.5 mm. Described from Mongolia .....  
 ..... (*Pezocrosita*) **lopardini** (MOHR, 1966).  
 -. Apical lamella of aedeagus shorter ..... **132**.  
 132. Aedeagus as in figs **2409, 2410**, about 1.1 mm long. Antennae except for 2–3 basal antennomeres dark. Length 4.5–5.4 mm. Forms two subspecies: smaller (4.5 mm), lateral sides of pronotum almost parallel, primary and secondary punctures on elytra of similar size, body generally more slender, apices of tibiae and tarsi lightened (nominotypical subspecies); larger (5.4 mm) lateral sides of pronotum more rounded, primary punctures on elytra at least in the middle distinct and stronger than secondary puncturation. Antennae dark except underside of antennomeres 1–2, legs blackish, claws and apices of claw tarsomeres paler (subsp. *purkynei* MOHR, 1966). Both subspecies described from Mongolia .....  
 ..... (*Pezocrosita*) **pusa** (LOPATIN, 1962).  
 -. Aedeagus as in figs **2411, 2412**, about 1.8 mm long. Externally similar to *pusa* (thesis 132). Described from Tuva ..... (*Pezocrosita*) **sajanica** (JACOBSON, 1925).  
 133. Lateral thickenings of pronotum very feeble, only in hind part perceptible .... **134**.  
 -. Lateral thickenings of pronotum absent ..... **138**.  
 134. On elytra nine slightly, but distinctly impressed furrows, in each furrow runs a row of primary punctures. Intervals gently convex, distinctly and randomly covered by fine secondary puncturation. Pronotum large with rounded sides, general outline of body broadly oval, remaining somewhat the genus *Cyrtonus* ..... **135**.  
 -. Other combination of characters ..... **136**.



Figs 2411-2416. Aedeagus in dorsal and lateral view (2411, 2412 after VORONOVA 1985, 2413-2416 after LOPATIN 1998): 2411, 2412 – *Chrysolina* (*Pezocrosita*) *sajanica*; 2413, 2414 – *C. (P.) altimontana*; 2415, 2416 – *C. (P.) amplicollis*.

135. Aedeagus (figs **2413, 2414**) in dorsal view slightly broadened toward apex, apex broadly rounded. Head and pronotum bluish-black, elytra dark green with golden reflex. Length about 5.5 mm. Distributed in NW China .....  
 ..... (*Pezocrosita*) **altimontana** (RYBAKOW, 1889).

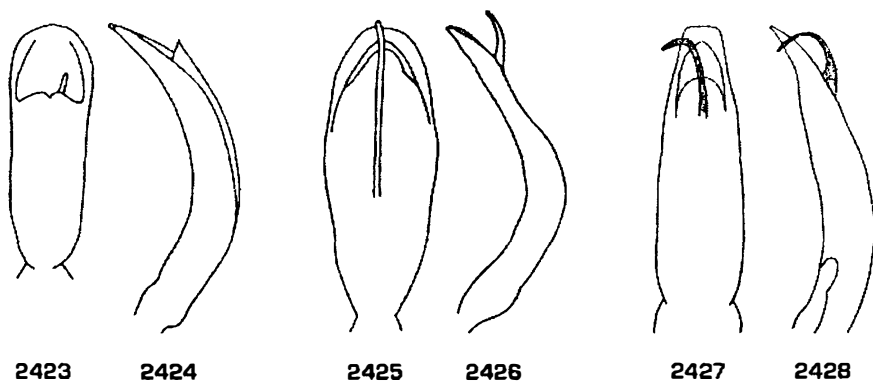
- Body black with violaceous reflex, pronotum with bluish or greenish, sometimes bronzy-greenish metallic reflex, antennae and legs brown, apices of tibiae and tarsi sometimes darkened. Length 5.0–5.5 mm. Distributed in NW China .....  
..... (*Pezocrosita*) ***amplicollis*** (JACOBSON, 1895).
- 136. Intervals of primary rows on elytra covered by relatively strong secondary punctures, here and there also by traces of ridges. Upper side uniformly green with metallic shine, underside black. Pronotum large, 1.7 × broader than long, laterally slightly flattened, covered by fine, distinct and dense puncturation. Primary punctures of elytra arranged in geminate rows, juxtasutural row in its hind part impressed, furrow-like. General view as in plate LXIII, **phot. 562**. Aedeagus as in figs **2417**, **2418**. Length 7.0 mm. Described from Kirghyzstan, based on one male only, but subsequently collected several times in same area .....  
..... (*Pezocrosita*) ***tshatkalia*** (LOPATIN, 1970).
- Intervals of primary rows on elytra covered by fine punctures ..... **137**.
- 137. Secondary punctures on elytra very fine and somewhat indistinct. Body size and outline as in *obovata* (thesis 123). Last palpomere as broad as penultimate, its apex transversely cut. Upper side purplish-blue, green or golden, metallic shine not very strong. Aedeagus as in figs **2419**, **2420**. Length 5.0–6.4 mm. Described from S Kazakhstan ..... *Pezocrosita* ***almaatica*** (LOPATIN, 1962).
- Secondary punctures on elytra fine but distinct. Last palpomere somewhat narrower than penultimate, its apex gently rounded. Aedeagus as in figs **2421**, **2422**. Length 5.0–7.0 mm. Described from NW China (Kuldzha) .....  
..... (*Pezocrosita*) ***juldusana*** (LOPATIN, 1962).



Figs 2417–2422. Aedeagus in dorsal and lateral view (2417, 2418 after LOPATIN 1977; 2419, 2420 after LOPATIN 1970; 2421, 2422 after LOPATIN 1992): 2417, 2418 – *Chrysolina (Pezocrosita) tshatkalia*; 2419, 2420 – *C. (P.) almaatica*; 2421, 2422 – *C. (P.) juldusana*.

- 138. Smaller species, length of body in males 5.2–5.7 mm, in females 6.0–6.1 mm .....  
..... **138**.
- Larger species, length of body in males 6.2–6.6 mm, in females 6.9–8.0 mm .....  
..... **141**.

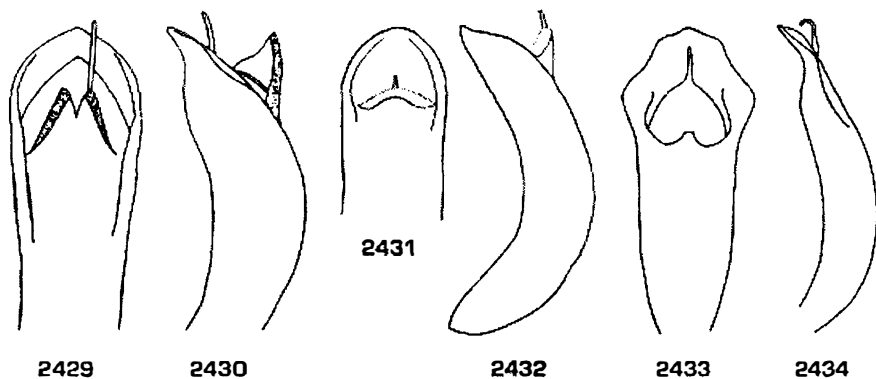
139. Punctures on pronotum very fine, sparse and indistinct. Upper side black-green or bluish-violaceous, sometimes pronotum black-green and elytra bluish-black or bluish violaceous. Rows of primary elytral punctures fine and mostly shallow. General view as in plate LXIII, **phot. 563**. Aedeagus as in figs **2423**, **2424**. Length 5.0–6.0 mm. Distributed in Kirghystan and Kazakhstan .....  
 ..... (*Pezocrosita*) **oschanini** (LOPATIN, 1965).
- . Punctures on pronotum finely, but distinctly and densely punctured ..... **140**.



Figs 2423–2428. Aedeagus in dorsal and lateral view (after LOPATIN 1992): 2423, 2424 – *Chrysolina* (*Pezocrosita*) *oschanini*; 2425, 2426 – *C. (P.) verestschaginae*; 2427, 2428 – *C. (P.) ketmenica*.

140. Body very convex, sides of pronotum and elytra steeply falling. Upper side black with weak golden reflex. Antennae and legs piceous. Aedeagus as in figs **2425**, **2426**. Length 5.2–6.1 mm. Distributed in Kirghystan and S Kazakhstan .....  
 ..... (*Pezocrosita*) **verestschaginae** LOPATIN, 1992.
- . Body not particularly convex. Coloured as *verestschaginae* (thesis 140), but antennae and legs paler, dark rusty-brown or brown. Aedeagus as in figs **2427**, **2428**. Distributed in SE Kazakhstan .....  
 ..... (*Pezocrosita*) **ketmenica** (LOPATIN, 1970).
141. Body roundish, upper side shining. Lateral sides of pronotum in hind 2/3 almost rectilinear, feebly divergent posteriad. Aedeagus (figs **2429**, **2430**) short, gradually widened toward apex, apex rounded with a trace of lamella. Length 6.2–8.0 mm (= *cyrtonoides* WEISE, 1892, nec JACOBY 1885, *cyrtonastes* WEISE, 1892). Distributed in Kirghystan and S Kazakhstan .... (*Pezocrosita*) **brevilata** (HEYDEN, 1886).
- . Body oval, upper side moderately shining or semimatt ..... **142**.
142. General outline of body broadly oval, in midlength approximately parallel. Upper side finely reticulated, rather feebly shining. Black with weak bronzy reflex, legs pitchy black, antennae black with two basal antennomeres at least on underside rusty-red. Third antennomere 1.7 × longer than 2 and 1.3 × longer than 4. Punctuation of pronotum irregularly scattered, primary punctures of elytra fine, secondary punctures very fine. Aedeagus as in figs **2431**, **2432**. Length 6.5–8.2 mm (= *kata-*

- rinae* LOPATIN, 1965). Described from Tadzhikistan, reported also from Kyrgyzstan ..... (*Pezocrosita*) **koenigi** (JACOBSON, 1895).
- . Outline of body in midlength more rounded ..... 143.



Figs 2429-2434. Aedeagus or its apical part in dorsal and lateral view (2431, 2432 after BIEŃKOWSKI 2001, remaining after LOPATIN 1992): 2429, 2430 - *Chrysolina* (*Pezocrosita*) *brevilata*; 2431, 2432 - *C. (P.) koenigi*; 2433, 2434 - *C. (P.) sarcandica*.

143. Body broader. Disc of pronotum covered by deep and relatively dense puncturation, lateral sides broadly and regularly rounded. Secondary punctures on elytral intervals finely, but very distinct. Upper side black with feeble golden hue. Aedeagus as in figs **2433**, **2434**. Female unknown. Length 6.3 mm. Described from Dzhungarian Alatau (borderland of Kazakhstan and China) ..... (*Pezocrosita*) **sarcandica** LOPATIN, 1990.
- . Body less broad, in general outline broadened posteriad. Disc of pronotum covered by very fine, here and there almost disappearing puncturation. Lateral sides of pronotum in hind 2/3 almost rectilinear, feebly divergent posteriad. Elytral intervals finely reticulated, silky, almost impunctate. Upper side dark metallic bluish-violaceous. Aedeagus as in figs **2435**, **2436**. Length 6.5-6.9 mm. Described from Dzhungarian Alatau (borderland of Kazakhstan and China) .... (*Pezocrosita*) **petrenkoi** LOPATIN, 1992.

#### Auxiliary group F

Underside and legs dark red-brown or black with pale tarsi.

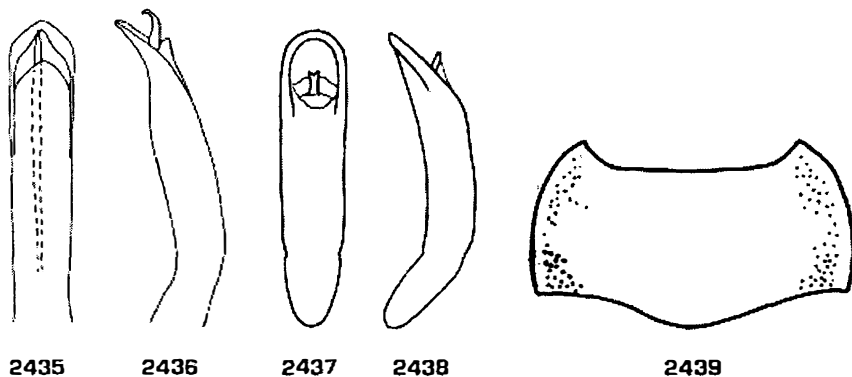
#### Key to species

1. Legs, antennae and palpi brownish red, remaining parts of body pure black, shining. Anterior angles of pronotum strongly protruding. Lateral sides only anteriorly rounded, in male almost straight, in female very feebly rounded, slightly converging anteriorly. Lateral thickenings very distinct, high, on whole length limited



by deep, smooth, impunctate but not sharply incised, gutter-like furrow. Aedeagus not studied. General view as in plate LXIII, **phot. 564**. Length 5.7–7.2 mm. Described from N China (Kansu) ..... **warchalowskii** LOPATIN, 2005.

- Body differently coloured ..... **2**.
- 2. Femora and tibiae black with distinct, usually violaceous, metallic sheen, tarsi differently coloured, yellow or brownish. Body dark reddish brown, pitchy or black, with metallic sheen. Outline of pronotum as in figs **2439**. Lateral borders of pronotum not swollen, indistinctly separated by very shallow, stronger punctured impression. Remaining puncturation of pronotum very fine, uniform. In male fore tarsi very strongly widened. Aedeagus as in figs **2437**, **2438**. Length 6.5–9.0 mm (= *diversipes* BEDEL, 1892, *violacea* WEISE, 1916). Variations: metallic sheen of upper side violaceous or blue (ab. *goettingensis* LINNAEUS, 1761), golden-green (ab. *polonica* WEISE, 1884) or bronzy (typical form). Distributed from France and south-western England, southern Scandinavia, Central Europa, northern Italy and basin of Danube to Russia, Ukraine, Caucasian countries and northern part of Transcaspian area ..... (*Colaphosoma*) **sturmi** (WESTHOFF, 1882).
- In legs tarsi not differently coloured ..... **3**.
- 3. Lateral borders of pronotum on whole length distinctly separated from central part by a deep, longitudinal impression ..... **4**.
- Lateral borders of pronotum sometimes swollen and more shining, but never on whole length distinctly separate from central part ..... **5**.

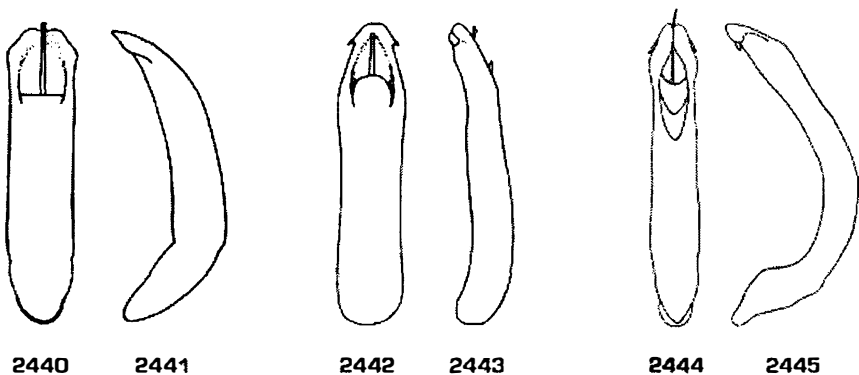


Figs 2435-2439. Aedeagus in dorsal and lateral view; pronotum (2435, 2436 after LOPATIN 1992, remaining after WARCHALOWSKI 1993): 2435, 2436 – *Chrysolina (Pezocrosita) petrenkoi*; 2437-2439 – *C. (Colaphosoma) sturmi*.

- 4. Length of body over 7.5 mm, lateral border of pronotum narrow, longitudinal impression covered by very strong punctures, central part of pronotum very finely punctulate. A west-mediterranean species. Upper side brown mit distinct, bronzy, metallic sheen, legs and antennae relatively pale, reddish. Aedeagus as in figs **2440**, **2441**. Length 7.5–11.0 mm. Variation: upper side bronzy-green (ab. *chlorizans* WEISE, 1884). Four another local vriations, sometimes ranked as subspecies, are

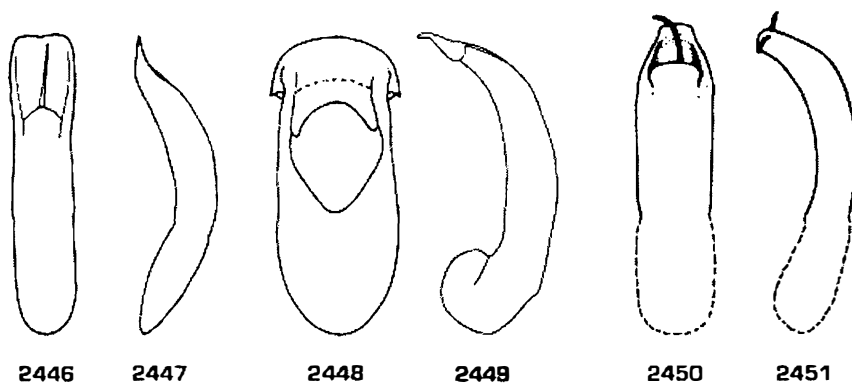
described: greater, sides of pronotum distinctly rounded (nominotypical subspecies from Iberian Peninsula, France, northern Italy, Ireland and England), smaller and more slender, sides of pronotum feebly rounded (subsp. *ibizensis* BECHYNÉ, 1950, described from Balears), body broad, upper side bronzy-green (subsp. *ausonia* SCHATZMAYR, 1941, from central Italy), sides of pronotum almost straight, elytral punctures finer and more sparse (subsp. *peloritana* SCHATZMAYR, 1941, described from Sicily). Distributed in western part of Mediterranean area, western France, and in southern parts of Ireland and England .....

- ..... (Chrysolina s. str.) ***bankii*** (FABRICIUS, 1775).
- . Length of body under 8.0 mm, lateral border of pronotum broad, longitudinal impression covered by fine punctures. Species from central and south-eastern part of Europe. Forms several subspecies: sides of pronotum almost straight. Aedeagus as in figs **2442, 2443**), (nominotypical subspecies, from southern Alps), sides of pronotum almost straight (subsp. *fallaciosa* MÜLLER, 1948, from southern Carinthia and northern Balkans), sides of pronotum rounded (subsp. *crassimargo* GERMAR, 1824 = *ominosa* BECHYNÉ, 1950, *bavarica* BECHYNÉ, 1950, *stoeckleini* BECHYNÉ, 1950, from Alps and southern Bavaria), sides of pronotum rounded, aedeagus broader (subsp. *rufocuprea* SUFFRIAN, 1851 = *hemisphaerica* GERMAR, 1817 s. str., nec LINNAEUS, 1758), from northern and central Germany, Sudetes and Carpathian mountains) ..... (Colaphoptera) ***purpurascens*** (GERMAR, 1817).
5. Lateral border of pronotum in hind 1/3 separated from central part by a deep, impressed or incised furrow, in anterior 2/3 by a shallow impression only. Caucasian species ..... **6**.
- . Lateral border of pronotum nowhere distinctly separate ..... **8**.
6. Body entirely reddish, upper side with feeble metallic reflex, on elytra external interval practically impunctate, smooth. Aedeagus as in figs **2444, 2445**. Length 4.8–6.2 mm. Distributed in eastern part of Caucasian area ..... (Colaphoptera) ***rosti*** (WEISE, 1892).
- . Body dark brown or pitchy, upper side with strong, purplish-violaceous sheen ..... **7**.



Figs 2440-2445. Aedeagus in dorsal and lateral view (2440, 2441 after WARCHALOWSKI 1993; 2342, 2343 after KIPPENBERG 1994; 2344, 2345 after LOPATIN 2000): 2440, 2441 – *Chrysolina (Chrysolina) bankii*; 2442, 2443 – *C. (Colaphoptera) purpurascens*; 2444, 2445 – *C. (C.) rosti*.

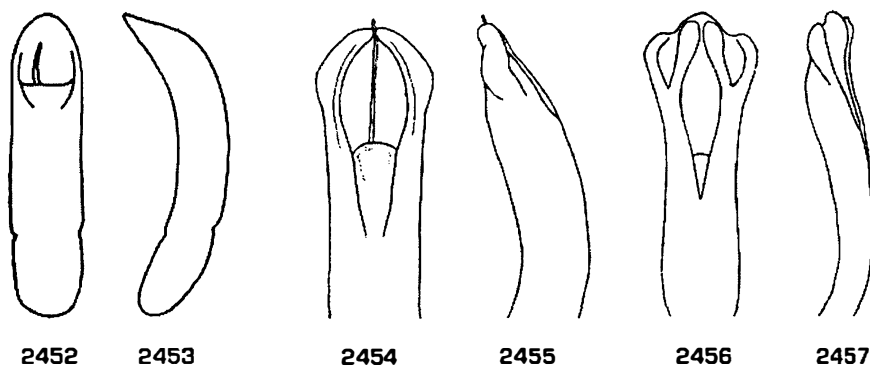
7. Elytra distinctly punctate external interval also finely but distinctly punctate. Aedeagus as in figs **2446**, **2447**. Length 5.0–6.0 mm. Forms a few local forms, ranked as subspecies: upper side strongly shining, body short oval (nominotypical subspecies occurring in Georgia), pronotum matt, distinctly reticulate, body more oblong (subsp. *danieli* ROUBAL, 1912), from north-western Caucasus, perhaps identical with *pliginskii* REITTER, 1913 from Crimea), impression separating lateral border of pronotum in anterior 2/3 more distinct as in *caspica* s. str., body usually larger (about 7.0 mm), more oblong (subsp. *apsilaena* SILFVERBERG, 1977, recently ranked as a distinct species, from Abchasia). Distributed in western part of Caucasian area ..... (*Colaphoptera*) ***caspica*** (WEISE, 1892).
- Elytra extremely finely punctate. Aedeagus as in figs **2448**, **2449**. Length about 6.0 mm (= *circassicola* REITTER, 1912). Distributed in Caucasian countries ..... (*Colaphoptera*) ***abchastica*** (WEISE, 1892).
8. European species ..... **9**.
- Species from Caucasus and Asia Minor ..... **10**.



Figs 2446-2451. Aedeagus in dorsal and lateral view (2450, 2451 after WARCHALOWSKI 1993, remaining after LOPATIN 2000): 2446, 2447 – *Chrysolina (Colaphoptera) caspica*; 2448, 2449 – *C. (C.) abchastica*; 2450, 2451 – *C. (C.) globosa*.

9. Aedeagus in apical part stronger narrowed (figs **2450**, **2451**). In male last article of maxillar palpi not particularly strongly widened. Length 5.4–8.3 mm. Distributed in Alps, Slovenia and in western Bulgaria ..... (*Colaphoptera*) ***globosa*** (PANZER, 1805).
- Aedeagus in apical part rather feebly narrowed (figs **2452**, **2453**). In male last article of maxillar palpi, strongly widened. Length 5.4–8.8 mm (= *opulenta* SUFFRIAN, 1851, *pachysoma* HUBETHAL, 1911). Very variable, forms a few subspecies: sides of pronotum feebly rounded, humeral part of elytra not much broader than pronotum (nominotypical subspecies = *frieseri* BECHYNÉ, 1950, *bohumilae*, BECHYNÉ, 1950, *staphylaeoides* BECHYNÉ, 1950, distributed in Germany, Alps and Schwarzwald), humeral part of elytra distinctly broader than pronotum, sides of pronotum rounded (subsp. *squalida* SUFFRIAN, 1851 = *dahlii* SUFFRIAN, 1851, *lapidaria* BECHYNÉ, 1950, *diminu-*

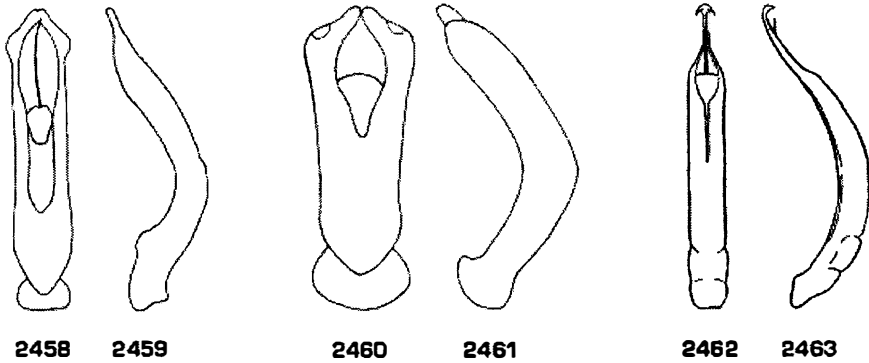
- ta* BECHYNÉ, 1950, distributed in Sudetes and Carpathians), humeral part of elytra distinctly broader than pronotum, sides of pronotum straight (subsp. *crassicollis* SUFFRIAN, 1851 = *rementina* BECHYNÉ, 1950 = *robusta* BREIT, 1919, distributed in southern Alps, Slovenia, Romania and Bulgaria, perhaps identical with *biharica* BREIT, 1919 from Romania) ..... (*Colaphoptera*) ***rufa*** (DUFTSCHMID, 1825).
10. Apex of aedeagus (figs **2454**, **2455**) obtusely rounded. Length 5.6–8.0 mm. Forms several local forms, described as subspecies: sides of pronotum before hind angles slightly emarginate, punctures on elytra strong, on pronotum much finer (nominotypical subspecies), sides of pronotum before hind angles slightly emarginate, punctures on pronotum almost as strong as on elytra (subsp. *minutior* BECHYNÉ, 1952 = subsp. *diga* BECHYNÉ, 1952, distributed in western Caucasus), sides of pronotum almost parallel, aedeagus as in *porphyrea* s. str. (subsp. *kubanica* BECHYNÉ, 1952, from north-western Caucasus), like the preceding one, but apex of aedeagus on both sides emarginate, similar to *kubanica*, but pronotum entirely matt (subsp. *erivanicola* BECHYNÉ, 1952, from Armenia). Distributed in Caucasian countries ..... *Colaphoptera* ***porphyrea*** (FALDERMANN, 1837).
- . Apex of aedeagus broadened ..... **11.**



Figs 2452-2457. Aedeagus in dorsal and lateral view (2450, 2451 after WARCHAŁOWSKI 1993, remaining after LOPATIN 1988): 2452, 2453 – *Chrysolina (Colaphoptera) rufa*; 2454, 2455 – *C. (C.) porphyrea*; 2456, 2457 – *C. (C.) adzharica*.

11. Sides of pronotum in anterior half rounded, slightly narrowed anteriorly, in hind half weakly sinuate. Aedeagus as in figs **2456**, **2457**. Length about 8.0 mm. Described from Georgia ..... (*Colaphoptera*) ***adzharica*** (LOPATIN, 1988).
- . Sides of pronotum evenly, gently rounded or almost straight ..... **12.**
12. Apex of aedeagus (figs **2458**, **2459**) approximately triangular. Puncturation of elytra deep, primary punctures finer than in *adzharica* (thesis 11), secondary puncturation distinct. Length 7.0–7.5 mm. Described from N Turkey .....  
 ..... (*Colaphoptera*) ***kataevi*** LOPATIN, 2000.

- Aedeagus more simply formed, with a broad, slightly incised lamella on apex (figs **2460**, **2461**). Length 5.5–7.5 mm (= *trapezicollis* BECHYNÉ, 1952). Includes a few local forms, described as subspecies: body broad and short, sides of pronotum straight (nominotypical subspecies, from western Caucasus), body broad and short, sides of pronotum slightly emarginate (subsp. *kutaisa* BECHYNÉ, 1952, from Georgia), body more oblong, punctures of elytra fine and very dense (subsp. *exsul* BECHYNÉ, 1952, described from western Caucasus). Distributed in eastern Turkey, western Caucasus and Georgia ..... (*Colaphoptera*) ***differens*** FRANZ, 1952.



Figs 2458–2463. Aedeagus in dorsal and lateral view (2464, 2465 after LOPATIN 2000; 2466, 2467 after LOPATIN 1988; 2468, 2469 after TAKIZAWA 1970): 2458, 2459 – *Chrysolina (Colaphoptera) kataevi*; 2460, 2461 – *C. (C.) differens*; 2462, 2463 – *C. (Apterosoma) porosirensis*.

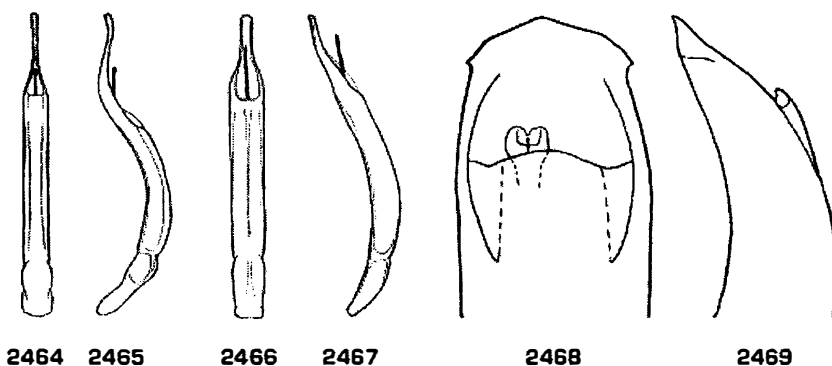
### Auxiliary group G

Lateral borders of pronotum on whole length swollen.

#### Key to species

1. On elytra numerous small, roundish, shining, impunctate area, arranged into 5 longitudinal rows, usually 25–35 on each elytron, sometimes partly reduced. Upper side usually dark bronzy. General view as in plate LXIII, **phot. 565**. Length 7.0–10.0 mm. Forms two (after some authors three) subspecies: upper side as above (subsp. nominotypical = *guttata* GEBLER, 1817 nec FABRICIUS, 1792 = *musiva* GEBLER, 1830 = *sericata* JACOBSON, 1901 = *speculifera* REDTENBACHER, 1848 from Russian Far East, China, Indochina and India); body on average smaller, colouration of upper side often somewhat bluish or greenish, distribution area limited to Japan (?subsp. *laevipunctata* LEWIS, 1879 = *marseuli* WEISE, 1898 = *subaenea* MOTSCHULSKY, 1860 nec DUFTSCHMID, 1825); elytra partly or almost entirely red, mentioned impunctate areas usually black, often partly disappearing (subsp. *gemmifera* MOTSCHULSKY, 1860 = *guttifera* MOTSCHULSKY, 1860 = *nigrogemmata* MOTSCHULSKY, 1860 from S Siberia and Mongolia) ..... (*Lithopteroides*) ***exanthematica*** (WIEDEMANN, 1821).
- On elytra no small shining area ..... **2.**

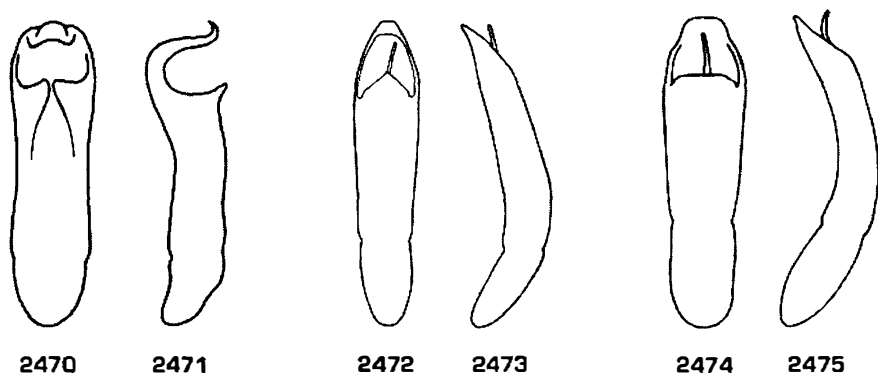
2. In female anal sternite prolonged into a process, bent ventrally and covered by somewhat prolonged apex of pygidium. Upper side with distinct, usually coppery or brassy metallic shine. Here three species (subsp. *Apterosoma* MOTSCHULSKY, 1860 = *Caudatochrysa* BECHYNÉ, 1950) from Far East ..... 3.
- . In female apex of abdomen without process ..... 5.
3. Length of body 7.0–8.0 mm. Punctures of upper side at most moderately strong. Aedeagus as in figs **2462, 2463**. Described from Japan (Hokkaido) .....  
..... (*Apterosoma*) ***porosirensis*** TAKIZAWA, 1970.
- . Length of body 8.0–12.0 mm. Punctures of upper side stronger ..... 4.
4. Pronotum largest in anterior part, narrowed posteriad. Upper side strongly punctured, punctures on pronotum and on elytra of similar size. Upper side with bronzy metallic shine, sometimes bicolorous (elytra with greenish or bluish hue). General view as in plate LXIII, **phot. 566**. Aedeagus as in figs **2464, 2465**. Distributed in E Siberia, N China and Japan .....  
..... (*Apterosoma*) ***angusticollis*** (MOTSCHULSKY, 1860).
- . Pronotum largest in the midlength, upper side less strongly punctured. Aedeagus as in figs **2466, 2467**. Described from Japan (Hokkaido) .....  
..... (*Apterosoma*) ***aino*** TAKIZAWA, 1970).
5. Elytra with 10 costae, intervals sulciform, not deep, each with two irregular puncture stripes or rows. Upper side black with feeble but distinct metallic violaceous reflex. Lateral margins of pronotum regularly rounded, lateral thickenings convex, on whole length separated from disc by punctured impression. Aedeagus as in figs **2468, 2469**. Length 9.0–11.5 mm (= *filchnerae* WEISE, 1908). Distributed in S Mongolia and NW China ..... (*Chrysocrosita*) ***alaschanica*** (JACOBSON, 1898).
- . Elytra without costae ..... 6.



Figs 2464-2469. Aedeagus or its apical part in dorsal and lateral view (2468, 2469 after BIENKOWSKI 2001; remaining after TAKIZAWA 1970): 2464, 2465 – *Chrysolina* (*Apterosoma*) *angusticollis*; 2466, 2467 – *C.* (*A.*) *aino*; 2468, 2469 – *C.* (*Chrysocrosita*) *alaschanica*.

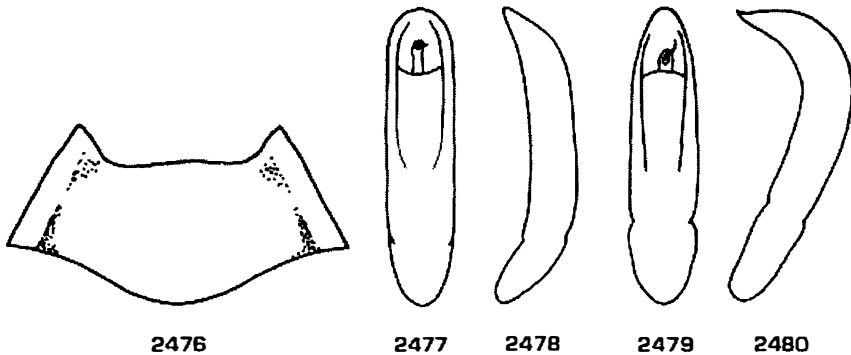
6. Pronotum trapezoidal, its lateral margins almost straight, convergent anteriorly ... 7.
- . Pronotum not trapezoidal, its lateral margins rounded ..... 10.

7. Lateral borders of pronotum steep, situated laterally, in dorsal view very narrow, primary punctures of elytra strong, often hollow-like deepened ..... **8**.
- Lateral borders of pronotum not very steep, situated dorsolaterally or dorsally, in dorsal view broader. Body oval, convex, upper side black with bluish, greenish-blue or greenish-bronzy metallic reflex. Antennae short and fine, usually article 1 on the underside and article 2 entirely red. In male all tarsi widened. General view as in plate LXIII, **phot. 567**. Aedeagus as in figs **2470, 2471**. Length 8.0–11.0 mm. Variations (ranked partly as subspecies): metallic reflex of upper side greenish-bronzy (typical form), blue-violaceous (ab. *moreana* BECHYNÉ, 1950) or absent (ab. *florea* HERRICH-SCHÄFFER, 1838). Forms 8 subspecies: elytral punctures strong, interstices shining (subsp. *ottomana* WEISE, 1906, from Turkey, Greece and Bulgaria), elytral punctures strong, interstices feebly shining, metallic reflex dark greenish-blue (subsp. *italica* WEISE, 1882 from Italy, S France and Tirol), further subspecies, separated by different combinations of characters, are: subsp. *cantabrica* HEYDEN, 1870 from Asturia, subsp. *egelida* BECHYNÉ, 1952 from Navarra, subsp. *gallica* WEISE, 1882 and subsp. *pyrenaica* DUFOUR, 1843 (characterized by flattened borders of pronotum), both distributed in Pyrenees, subsp. *herii* HERRICH-SCHÄFFER, 1839 and subsp. *muchi* MOHR, 1969 from Balkans. Distributed in mentioned areas ..... (*Ovosoma*) **vernalis** (BRULLÉ, 1832).
8. Puncturation of elytra very dense, composed of strong, hollow-like, partly confluent primary punctures (plate LXIV, **phot. 568**) and very distinct secondary punctures, interstices strongly convex. Body black. Ground of elytra shining, central part of pronotum extremely finely reticulate and punctulate, matt. Aedeagus as in figs **2472, 2473**. General view as in plate LXIV, **phot. 568**. Length 7.2–8.8 mm. Distributed in Morocco and southern part of Iberian Peninsula, perhaps conspecific with *coriacea* SUFFRIAN, 1851 and *rugipennis* HAROLD, 1875 ..... (*Allochrysolina*) **opacicollis** (FAIRMAIRE, 1865).
- Puncturation of elytra not particularly dense, primary punctures not confluent ..... **9**.



Figs 2470–2475. Aedeagus in dorsal and lateral view (2472, 2473 orig., remaining after WARCHAŁOWSKI 1993): 2470, 2471 – *Chrysolina* (*Ovosoma*) *vernalis*; 2472, 2473 – *C. (Allochrysolina) opacicollis*; 2474, 2475 – *C. (A.) fuliginosa*.

9. On elytra primary punctures great, shallowly hollow-like deepened. Body black with bluish or violaceous metallic reflex, particularly on legs. Elytra often (in immature specimens?) dark reddish. Aedeagus not studied. Length 8.0–9.0 mm (= *opaca* SUFFRIAN, 1853). Variations: elytra black, usually with feeble bluish reflex (typical form), elytra entirely dark red (unnamed), elytra dark red with a great, common, triangular black spot (ab. *dorsalis* WEISE, 1884), primary punctures of elytra only very feebly hollow-like deepened, upper side poorly shining (ab. *semiopaca* FAIRMAIRE, 1873). Distributed in Algeria, perhaps conspecific with *crassipes* LUCAS, 1849 ..... (*Allochrysolina*) ***confossa*** (FAIRMAIRE, 1865).
- . On elytra primary punctures not or feebly hollow-like deepened. Outline of pronotum as in fig. 2476. Body black, metallic reflex of upper side very feeble, usually bluish, often absent. In anterior half of elytra primary punctures forms 9 indistinct rows. Aedeagus as in figs 2474, 2475. Length 8.0–10.0 mm. Variations: metallic reflex of upper side bluish, very feeble often barely perceptible (typical form), metallic reflex of upper side feeble, but distinct, cupreous (unnamed), metallic reflex feeble, on pronotum dark bluish, on elytra greenish-black (unnamed). Occurs as a few geographical forms: on elytra primary punctures feebly hollow-like deepened (subsp. *espanoli* BECHYNÉ, 1950, from northern Spain; a form intermediate between *opacicollis*, thesis 8, and *fuliginosa*), on elytra primary punctures strong (subsp. *molluginis* SUFFRIAN, 1853 = *galii* WEISE, 1884, from Central Europe), on elytra primary punctures moderately strong (nominotypical subspecies = *microsticha* BECHYNÉ, 1949 = *gendreaui* BECHYNÉ, 1949, north-western Italy and France). Distributed mainly in France and Germany ..... (*Allochrysolina*) ***fuliginosa*** (OLIVIER, 1807).



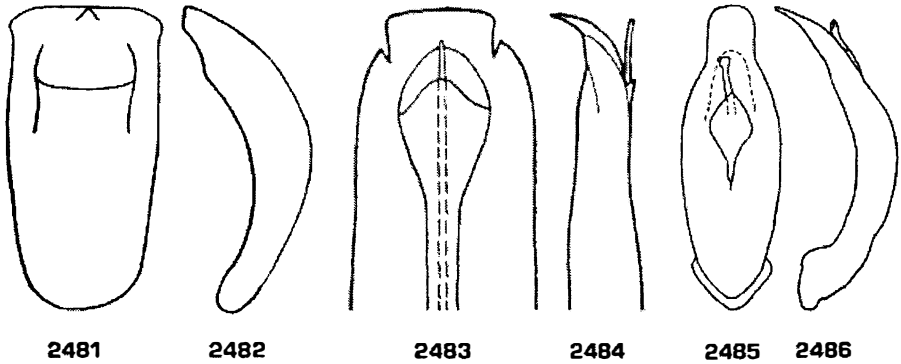
Figs 2476-2480. Pronotum and aedeagus in dorsal and lateral view (after WARCHALOWSKI 1993): 2476 – *Chrysolina* (*Allochrysolina*) *fuliginosa*; 2477, 2478 – *C. (Anopachys) relucens*; 2479, 2480 – *C. (Chrysomorpha) cerealis*.

10. Elytra with longitudinal, alternating, differently coloured or at least differently shining stripes ..... 11.
- . Elytra either uniformly coloured or bicolorous (sutural stripe and/or lateral margins differently coloured), but without alternating stripes ..... 12.



11. Intervals on elytra not punctulate, strongly shining. Upper side red-cupreous, bronzy or almost black with greenish reflex. Lateral impressions on pronotum with large punctures near base only. Aedeagus as in figs **2477**, **2478**, its apex in ventral view almost regularly rounded or with very tip somewhat transversely cut. Length 5.9–6.9 mm (male) to 6.0–7.9 mm (female). Distributed from White Sea area to Russian Far East, occurs also in Alps, in Tirol and Vorarlberg ..... (Anopachys) **relucens** (ROSENHAUER, 1847).
- Intervals on elytra punctulate, moderately shining. Usually upper side dark violaceous, with purplish, golden-green bordered intervals 2, 4, 6 and 8. In dark variations ground colour of elytra black-blue with dark violaceous stripes. Intervals 1, 3, 5 and 7 much stronger punctured. Aedeagus as in figs **2479**, **2480**. Length of body in European forms 6.2–9.5 mm. Variations: **1**) ground dark violaceous, stripes as above (typical form), stripes purplish-violaceous (ab. *uzeli* BECHYNÉ, 1948), stripes cupreous (unnamed), stripes golden-green or green (ab. *fastidita* BECHYNÉ, 1948), stripes dark green (ab. *purkynei* BECHYNÉ, 1948), stripes bluish (ab. *luxurians* OLIVIER, 1807), stripes similarly coloured, but more shining (ab. *octovittata* SCHRANK, 1789), **2**) ground cupreous-violaceous, stripes green (ab. *laminula* HERRICH-SCHÄFFER, 1838), stripes on elytra feebly differing, on pronotum green (ab. *tincticollis* BECHYNÉ, 1948). Geographical variability very distinct, 5 subspecies and 10 “nationes” are described: intervals 2, 4 and 6 distinctly stronger shining and usually very differently coloured; body more convex (nominotypical subspecies, distributed in western, central and northern parts of Europe), as *cerealis* s. str., but body feebly convex, length 7.5–11.0 mm (subsp. *rufolineata* MOTSCHULSKY, 1860, from basin of Amur), as *rufolineata*, but smaller, length 6.5–7.5 mm, usually brightly coloured (subsp. *cyaneoaurata* MOTSCHULSKY, 1860, from eastern Siberia), intervals 2, 4 and 6 distinctly but feebly different (subsp. *mixta* KÜSTER, 1844, from Alps and Pyrenees), only intervals 2 and 4 different, dark aberrations predominate (subsp. *alternans* PANZER, 1799, from northern Balkans and basin of Danube). Transpalaeartic species, distributed from Great Britain and northern Spain to basins of Amur and Ussuri ..... (*Chrysomorpha*) **cerealis** (LINNAEUS, 1767).
12. Upper side with very distinct metallic shine, cupreous or dark golden, all margins, sutural margin including, greenish or bluish. Lateral thickenings of pronotum very distinctly separated from disc by deep punctured furrow and differently coloured (disc cupreous or golden, lateral thickenings green or blue). Primary puncturation of elytra random, almost uniform, dense and relatively strong, secondary punctures very sparse. Aedeagus as in figs **2481**, **2482**. Length 7.2–10.8 mm. Distributed in Sayan Mts and in Tuva ..... (*Chrysocrosita*) **jakowlewi** (WEISE, 1894).
- Upper side differently coloured ..... **13**.
13. Body very broad (breadth/length > 0.70) and convex ..... **14**.
- Body neither very broad (ratio breadth/length < 0.65), nor particularly convex ....  
..... **24**.
14. Lateral border of pronotum in hind part separate by a deeply incised, smooth-edged furrow ..... **15**.
- Lateral border of pronotum in hind part separate by a rather broad impression. Ground of elytra feebly shining or matt, secondary reticulation always well-developed. Length of body over 9.0 mm ..... **18**.

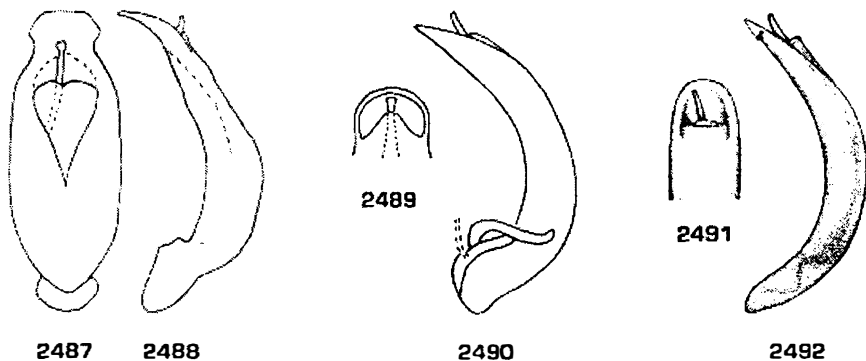
15. Lateral sides of pronotum feebly rounded, converging anteriorly. Ground of elytra strongly shining, secondary reticulation indistinct or entirely absent. Body black, usually with very feeble, purplish, cupreous or violaceous metallic reflex. Length of body 6.5–8.5 mm. Here very dark forms of *hemisphaerica* (auxiliary group F, antithesis 4).
- . Lateral sides of pronotum rounded, not distinctly converging anteriorly ..... 16.



Figs 2481–2486. Aedeagus or its apical part in dorsal and lateral view (2481, 2482 after KIPPENBERG in litt.; 2483, 2484 after BIENKOWSKI 2001; 2485, 2486 after LOPATIN 1988): 2481, 2482 – *Chrysolina (Chrysocrosita) jakowlewi*; 2483, 2484 – *C. (Crositops) roddi*; 2485, 2486 – *C. (C.) pedestris*.

16. Aedeagus (figs 2483, 2484) incised on both sides of apex. Ground of elytra feebly shining. Upper side dark bronzy-green or black with feeble cupreous reflex. Externally similar to *pedestris* (thesis 17). Length 7.6–9.5 mm (male) to 11.0 mm (female). Distributed in S Ural region, from basin of Samara to Chelyabinsk district ..... (*Crositops*) **roddi** (JACOBSON, 1897).
- . Aedeagus not incised ..... 17.
17. Pronotum about 2 × broader than long, antennomeres 7–9 distinctly, at least 1.5 × longer than broad. Upper side with cupreous or violaceous metallic shine, not strongly shining, primary puncturation of elytra entirely random, secondary punctures rather sparse. General view as in plate LXIV, phot. 569. Apical part of aedeagus (figs 2485, 2486) narrowed, with parallel sides, apex obtusely rounded. Length 9.0–11.5 mm (= *pterosticha* FISCHER de WALDHEIM, 1842). Distributed from E Kazakhstan and W Siberia to Altai Mountains ..... (*Crositops*) **pedestris** (GEBLER, 1823).
- . Pronotum somewhat longer, about 1.8 × broader than long, antennomeres 7–9 as broad as long. Upper side bluish black. Apical part of aedeagus (figs 2487, 2488) laterally constricted narrowed, shorter than in *pedestris* (thesis 17). Generally similar to *pedestris*, but much smaller, length 7.7 mm. Described from E Kazakhstan, based on one male only ..... (*Crositops*) **kabaki** LOPATIN, 1988.
18. Puncturation of pronotum relatively strong, thick, always distinct. Lateral impression on pronotum basally rather feeble, apically almost disappearing. Underside and

- legs with bluish reflex, upper side with very distinct metallic bronzy sheen. Aedeagus not studied. Length 10.0–11.0 mm. Distributed in Iberian Peninsula .....  
 ..... (*Threnosoma*) **tagana** (SUFFRIAN, 1851).
- Puncturation of pronotum very fine, sometimes barely perceptible ..... **19**.
  - 19. On elytra interstices not vermiculately rugose ..... **20**.
  - Elytra vermiculately rugose, body black ..... **22**.
  - 20. Elytral puncturation extremely fine and uniformly scattered, points joined by very fine scratches, interstices smooth and shining. Body black, underside shining. Aedeagus as in figs **2489**, **2490**, length 11.0–12.0 mm. Distributed in High Atlas ..... (*Threnosoma*) **serdanensis** JOLIVET, 1966.
  - Elytral puncturation not extremely fine. Body black, femora often dark red. Here black forms of *C. mairei* (subsp. *pauliani* PEYERIMHOFF, 1939). See auxiliary group B.
  - 21. Elytral puncturation fine, interstices on average 4–5 × broader than diameter of punctures. From each point diverge a few short, thin scratches. Upper side pure black, underside and legs sometimes with a feeble, violaceous, metallic reflex. Aedeagus as in figs **2491**, **2492**. Length 10.0–14.0 mm (= *atra* HERRICH-SCHÄFFER, 1838, nec GOEZE, 1777). Includes 3 subspecies: smaller (10.0–12.0 mm), very finely punctured (nominotypical subspecies, from Sicily), larger (12.0–14.0 mm) and moderately strong punctured, elytral sides regularly rounded (subsp. *vitiosa* BECHYNÉ, 1950, from Tunisia), like *vitiosa*, but elytra widened behind the middle (subsp. *extricata* BECHYNÉ, 1950, from Algeria). Distributed in Sicily and North Africa ..... (*Threnosoma*) **inflata** (WEISE, 1916).
  - Elytral puncturation very dense, double. Head distinctly but sparsely punctate. Aedeagus not studied. Length 9.5–10 mm. Described from central France based on two male specimens only ..... (*Threnosoma*) **joliveti** BECHYNÉ, 1950.

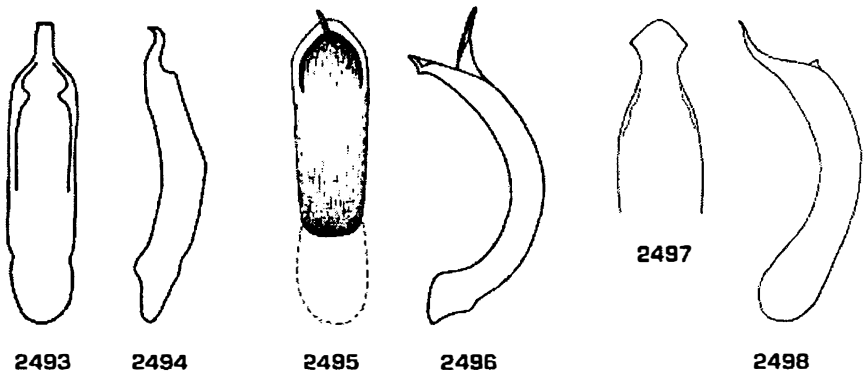


Figs 2487–2492. Aedeagus or its apical part in dorsal and lateral view (2487, 2488 after LOPATIN 1988; 2489, 2490 after JOLIVET 1962; 2491, 2492 after DACCORDI 1979): 2487, 2488 – *Chrysolina (Crositops) kabaki*; 2489, 2490 – *C. (Threnosoma) serdanensis*; 2491, 2492 – *C. (T.) inflata*.

- 22. Punctures of elytra moderately deep, foveiform. Short lateral furrow of pronotum on the inner side disturbed by great, flat erosions. Here specimens of *Ch. (T.)*

*tortipennis* with more swollen lateral thickenings of pronotum (see auxiliary group I, thesis 15).

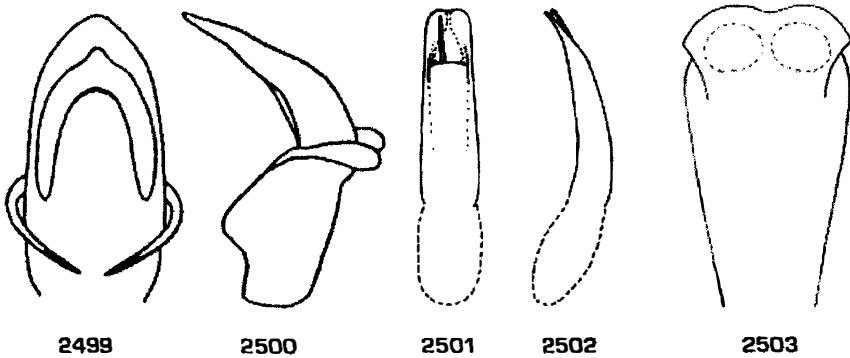
- Punctures of elytra not foveiform, a little indistinct, interstices 1.0–1.5 × broader than diameter of punctures ..... **23**.
- 23. Lateral border of pronotum broad, separated by rather scarcely punctured longitudinal impression. Here *cribrosa* subsp. *sirentensis* and also some other forms of *cribrosa* with more distinctly swollen anterior part of lateral border of pronotum (auxiliary group I, thesis 21).
- Lateral border of pronotum very narrow, separated by a broad furrow, irregularly covered by shallow, great, bowl-like impressions and indistinct punctures. Aedeagus not studied. Length 12.0–13.0 mm. Described from Morocco .....  
..... (*Threnosoma*) **tangeriana** (KOCHER, 1958).
- 24. Puncturation of elytra very strong, relatively dense, subseriate (about 11 irregular rows). Upper side black, shining, practically without metallic reflex. Lateral borders of pronotum in hind part separated by a deeply incised, smooth furrow, anteriorly by a stripe of points. Central part of pronotum very finely punctate. Aedeagus as in figs **2493**, **2494**. Length 7.3–10.4 mm. Distributed in south-eastern Bulgaria, European Turkey and Asia Minor ..... (*Ovosoma*) **turca** (FAIRMAIRE, 1865).
- Puncturation of elytra different, but not particularly strong ..... **25**.
- 25. Elytra matt or semimatt, very densely and finely reticulate, primary punctures fine ..... **26**.
- Elytra more or less shining, punctures fine or moderately strong, interstices 1–2 × broader than diameter of punctures ..... **30**.



Figs 2493–2498. Aedeagus or its apical part in dorsal and lateral view (2493, 2494 after WARCHAŁOWSKI 1993; 2495, 2496 after COBOS 1954; 2497, 2498 after MEDVEDEV 1970): 2493, 2494 – *Chrysolina* (*Ovosoma*) *turca*; 2495, 2496 – *C. (Stichoptera) colasi*; 2497, 2498 – *C. (Pseudolithoptera) interlucea*.

- 26. Species from Spain. Elytra black, epipleura anteriorly brown. Primary punctures of elytra here and there joined by traces of thin scratches, interstices 3–6 × broader than diameter of punctures. Secondary punctures extremely sparsely scattered or absent. Body black, head, pronotum, underside and legs sometimes with very fee-

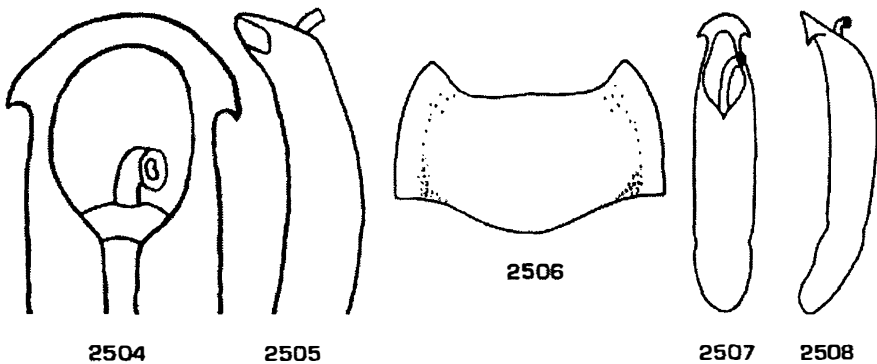
- ble violaceous metallic reflex. Aedeagus as in figs **2495**, **2496**. Length 7.6–9.8 mm. Endemic to Sierra Nevada (southern Spain) ..... (*Stichoptera*) **colasi** (COBOS, 1952).
- Species from E Asia ..... **27**.
  - 27. Primary punctures arranged in semiregular rows, secondary punctation abundant, about 2 × finer than primary punctures. Here two species: pronotum with greenish or bluish reflex, elytra brown with bronzy-violaceous reflex, species from E Siberia: see *cyaneovinosa* (group E, antithesis 43); upper side coloured uniformly, usually bluish, species from Tuva and Mongolia: see *convexicollis* (antithesis 27).
  - Upper side uniformly black with blue reflex. Primary punctures entirely random ... ..... **28**.
  - 28. Process of first abdominal sternite in male with obtuse ridge, its surface strongly elevated and with triangular impression in the middle. Pygidium convex, without median furrow. Female unknown. Aedeagus as in figs **2497**, **2498**. Length 10.0 mm. Described from Korea based on one male only ..... (*Pseudolithoptera*) **interlucea** MEDVEDEV, 1970.
  - In male abdomen without particular formations ..... **29**.



Figs 2499-2503. Aedeagus or its apical part in dorsal and lateral view (2499, 2500 after MEDVEDEV 1970; 2501, 2502 after KIPPENBERG 1994; 2503 after MEDVEDEV 1982): 2499, 2500 – *Chrysolina* (*Bechynea*) *nikolskyi*; 2501, 2502 – *C. (Anopachys) eurina*; 2503 – *C. (Lithocrosita) rugulosa*.

- 29. Punctures on elytra very fine or disappearing in hind part. Lateral thickenings of pronotum weakly convex. On underside of aedeagus (figs **2499**, **2500**) in apical part two longitudinal shallow impressions (if distinct) narrow, furrow-like. General view as in plate LXIV, **phot. 570**. Length 6.5–10.0 mm (= *kawakamii* MATSUMURA, 1911, *kabakovi* MEDVEDEV, 1966). Distributed in basin of Amur, Sakhalin and Kurile Isl. Perhaps conspecific *sulcicollis* (antithesis 29) ..... (*Bechynea*) **nikolskyi** (JACOBSON, 1898).
- Punctures on elytra fine but not disappearing in hind part. Lateral thickenings of pronotum more distinctly convex. On underside of aedeagus in apical part two longitudinal shallow impressions (if distinct) broader, somewhat oval. Length

- 6.7–10.4 mm. Four subspecies were described: upper side covered by finer reticulation, matt in both sexes, puncturation everywhere distinct (nominotypical subspecies), upper side matt in female, feebly shining in male, puncturation of pronotum not finer in anterior part (subsp. *adzhalamica* MEDVEDEV, 1970), upper side not reticulated, moderately shining (subsp. *solida* WEISE, 1898 = *koreana* CHŪJŌ, 1941), upper side matt in both sexes, puncturation of pronotum distinctly finer in anterior part (subsp. *sutschanica* MEDVEDEV, 1970). Nominotypical subspecies distributed in NE China, Korea and Japan (Hokkaido, Rishiri), subsp. *solida* in Korea, both remaining subspecies in Russian Far East ..... ***sulcicollis*** (FAIRMAIRE, 1887).
30. Lateral borders of pronotum in hind part separated by a incised, somewhat curved furrow ..... **31.**
- . Lateral borders of pronotum in hind part separated by a broader, punctured furrow or by impressed stripe of punctures ..... **32.**



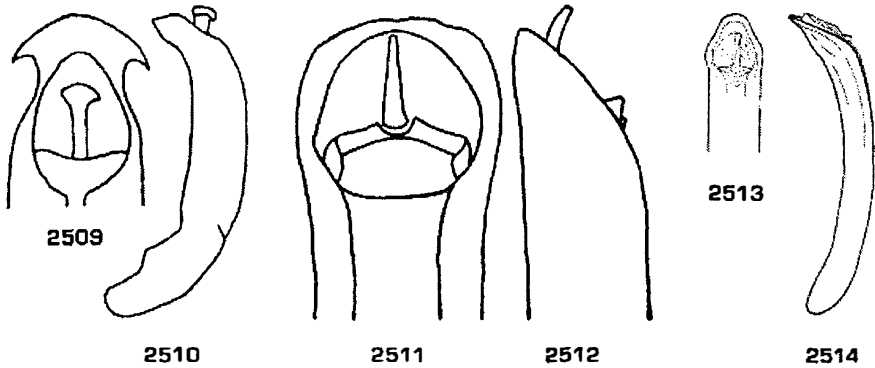
Figs 2504-2508. Aedeagus or its apical part in dorsal and lateral view; pronotum (2504, 2505 after BIEŃKOWSKI 1998, remaining after WARCHAŁOWSKI 1993): 2504, 2505 – *Chrysolina (Anopachys) schatzmayri*; 2506-2508 – *C. (A.) aurichalcea*.

31. European species. Body black with metallic, usually bronzy, sheen. Elytra perceptibly reticulate. Aedeagus as in figs **2501**, **2502**. Length 6.0–8.0 mm (= *perplexa* BREIT, 1920). Distributed in basin of Danube and in southern Carpathians ..... (*Anopachys*) ***eurina*** (FRIVALDSZKY, 1883).
- . Species from Central Asia. Body oval, convex, externally somewhat similar to *Bitotaenia* (auxiliary group E, theses 30–34) but differing by random puncturation, elytra without humeral calli. Upper side black-blue, densely punctured, punctures on disc of pronotum and on elytra similar, on lateral sides of elytra behind humeri sometimes confluent, forming fine rugosities. Aedeagus (fig. **2503**) on underside with two shallow impressions in apical part. Length 6.8–10.2 mm. Distributed in Altai, Tuva, E Sayan Mts. and N Mongolia ..... (*Lithocrosita*) ***rugulosa*** (GEBLER, 1841).
32. Impression separating lateral borders of pronotum from disc in hind part covered by very strong and deep punctures. Upper side violaceous with weak purplish reflex.

Primary puncturation of elytra loosely scattered, interstices very finely punctulated, secondary punctulation mixed with very fine scratches. Differently sculptured forms of *cyanopurpurea* (auxiliary group E, thesis 27).

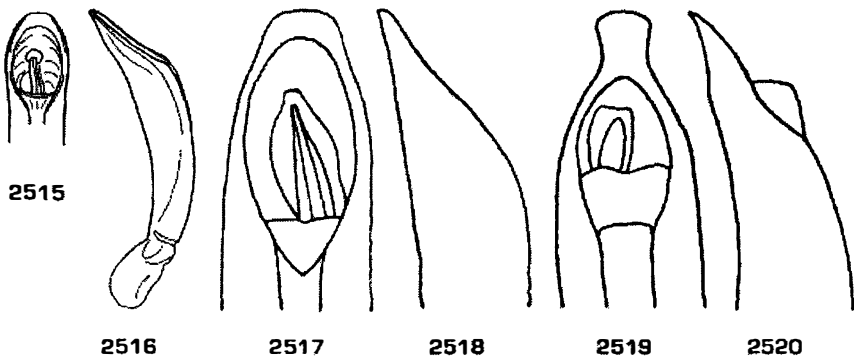
- Impression separating lateral borders of pronotum from disc in hind part covered by moderately strong or fine punctures ..... 33.
- 33. Apex of aedeagus very distinctive (figs 2504, 2507), broad, anchor-shaped, on apical part with posteriad bent thorns ..... 34.
- Apex of aedeagus differently shaped ..... 37.
- 34. European species ..... 35.
- Asiatic species ..... 36.
- 35. Aedeagus in dorsal view feebly constricted behind lateral denticles. Upper side coppery with greenish tinge. Length 7.3–8.2 mm. Distributed in NE Italy ..... (Anopachys) *schatzmayri* (MÜLLER, 1916).
- Apical triangle of aedeagus short, aedeagus (2507, 2508) in dorsal view deeper constricted behind lateral denticles. Lateral borders of pronotum (2506) in hind part separated by a broader, punctured furrow or by impressed stripe of punctures. Body elongate, sides of elytra feebly rounded, upper side black with metallic sheen, without reticulation (or only very feebly in European forms 5.3–8.3 mm (male) to 6.5–9.6 mm (female)). European forms on average distinctly smaller than E Asiatic forms. Variations: metallic sheen of upper side bronzy or cupreous (typical form), golden-green or green (ab. *elevata* SUFFRIAN, 1851), almost black (ab. *nigricans* JACOBSON, 1900) or bicolorous: elytra bronzy-green, head and pronotum violaceous or purplish (ab. *violaceicollis* MOTSCHULSKY, 1861). *C. aurichalcea* was subject to detailed karyological studies which revealed six different karyotypes; this may explain its wide individual and geographic variation. This species displays a very wide local variation, which provided a basis for description of ca. 30 forms ranked as varieties, subspecies or even species. In Europe represented by 3 subspecies: upper side blue or violaceous, sometimes with greenish reflex; apical margin of aedeagus mostly triangular (subsp. *asclepiadis* VILLA, 1833, = *thurntaxisi* SCHATZMAYR, 1927 from foothills of southern Alps and Liguria); colouration of upper side as in *asclepiadis*, denticles on apex of aedeagus shorter (subsp. *bohemica* MÜLLER, 1948 = *problematica* KASZAB, 1962, from Harz, Erzgebirge, Sudetian Mts and Czech Republic); upper side bronzy, coppery or greenish, epipleura densely ciliate (subsp. *nomino-typica*), distributed from Krimea to Japan). Species distributed from Central Europe to Japan and Indochina ..... (Anopachys) *aurichalcea* (MANNERHEIM, 1825).
- 36. Apical triangle of aedeagus short, aedeagus in dorsal view deeper constricted behind lateral denticles. See *aurichalcea* s. str. (antithesis 35).
- Apical triangle of aedeagus (2509, 2510) longer, aedeagus in dorsal view shallower constricted behind lateral denticles. Length 5.7–7.5 mm (male) to 6.0–7.8 mm (female). Distributed from Altai to Japan ..... (Anopachys) *quadrangulata* (MOTSCHULSKY, 1860).
- 37. Elytra randomly punctured, but at least with traces of 3 or 4 longitudinal impunctate stripes ..... 38.
- Elytra randomly punctured without traces of impunctate stripes ..... 43.
- 38. Wings developed, reaching at least to end of elytra. Humeral calli convex ..... 39.
- Wings reduced or absent ..... 40.

39. Lateral impressions on pronotum with stripe of very strong, dense punctures on whole length. Upper side black often with bronzy reflex. Aedeagus as in figs 2511, 2512. Length 6.6–6.8 mm (male) to 7.1–7.5 mm (female). Distributed in E China and Korea ..... (*Anopachys*) ***gensanensis*** (WEISE, 1900).
- . Lateral impressions on pronotum with large punctures near base only. See *relucens* (thesis 11).



Figs 2509-2514. Aedeagus or its apical part in dorsal and lateral view (2513, 2514 after MIKHAILOV 2006; remaining after BIENKOWSKI 1998) 2509, 2510 – *Chrysolina* (*Anopachys*) *quadrangulata*; 2511, 2512 – *C. (A.) gensanensis*; 2513, 2514 – *C. (A.) sundukovi*.

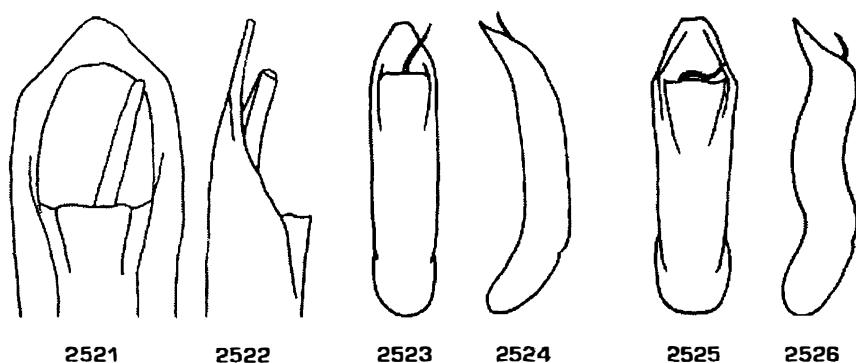
40. Apical part of aedeagus not broadened ..... 41.
- . Apical part of aedeagus slightly broadened. Aedeagus (figs 2513, 2514) in lateral view not thickened anteriorly, foramen shorter. Length 7.1–7.3 mm. Described from Ussuria ..... (*Anopachys*) ***sundukovi*** MIKHAILOV, 2006.



Figs 2515-2520. Apical part of aedeagus in dorsal and lateral view (2515, 2516 after MIKHAILOV 2006, remaining after BIENKOWSKI 1998) 2515, 2516 – *Chrysolina* (*Anopachys*) *lineella*; 2517, 2518 – *C. (A.) lineigera*; 2519, 2520 – *C. (A.) neglecta*.



41. Apex of aedeagus (figs **2515**, **2516**) broadly rounded or broadly obtuse ..... **42**.  
 - Apex of aedeagus (figs **2517**, **2518**) narrowed and obtusely cut. Length 6.1–7.3 mm (male) to 6.6–7.7 mm (female). Distributed in basin of Amur, N China, Sakhalin and Japan (Hokkaido) ..... (*Anopachys*) **lineigera** (JACOBSON, 1901).
42. Lateral swellings of pronotum absent or barely marked. Length 7.5–8.0 mm. Insular species, distributed in Sachalin and Japan .....  
 ..... (*Anopachys*) **watanabei** TAKIZAWA, 1970.
- Lateral swellings of pronotum distinct, separated from disc by gently impressed furrow. Length 6.8–8.7 mm. Continental species, distributed in basin of Amur, see also thesis 43 ..... (*Anopachys*) **lineella** (WEISE, 1887).
43. Lateral thickenings of pronotum feebly developed, in anterior part almost fused with disc. See *carpathica*, auxiliary group J, thesis 15).  
 - Lateral thickenings of pronotum separate on whole length at least by a shallow impression ..... **44**.
44. E Asiatic species ..... **45**.  
 - European species ..... **46**.



Figs 2521-2526. Aedeagus or its apical part in dorsal and lateral view (2521, 2522 after BIEŃKOWSKI 1998; remaining after WARCHAŁOWSKI 1993): 2521, 2522 – *Chrysolina* (*Anopachys*) *pala*; 2523, 2524 – *C. (Helio-stola)* *schneideri*; 2525, 2526 – *C. (H.) lichenis*.

45. Apex of aedeagus (figs **2519**, **2520**) constricted. Length 5.8–6.3 mm (male) to 6.1–7.0 mm (female). Distributed in Khabarovsk area and Primorski Krai .....  
 ..... (*Anopachys*) **neglecta** BIEŃKOWSKI, 1998.
- Apex of aedeagus shortly triangular, obtuse (figs **2521**, **2522**). Female unknown. Length 6.6 mm. Described from Primorski Krai .....  
 ..... (*Anopachys*) **pala** BIEŃKOWSKI, 1998.
46. Body feebly convex, *Oreina*-like, lateral sides of pronotum almost parallel, rounded only anteriorly. Upper side black with dark blue metallic reflex. General view as

- in plate LXIV, **phot. 571**. Aedeagus as in figs **2523, 2524**. Length 5.6–7.0 mm. Endemic to Tatra mountains ..... (*Heliostola*) ***schneideri*** (WEISE, 1898).
- . Body more convex, not *Oreina*-like. Lateral sides of pronotum rounded, in very rare variation of *lichenis* almost straight, but not parallel ..... **47**.
47. Longitudinal impression separating swollen lateral borders of pronotum covered by fine punctures, similarly as central part. General view as in plate LXIV, **phot. 572**. Aedeagus as in figs **2525, 2526**. Length 5.5–7.5 mm. Variations: upper side unicolorous, deeply blue or blue-black (ab. *prunicea* BECHYNÉ, 1947), greenish blue (ab. *jugosa* BECHYNÉ, 1947), black green, with olive or dark bronzy metallic reflex (typical form), black with bronzy or cupreous metallic reflex (ab. *februa* BECHYNÉ, 1947), purplish-violaceous (ab. *mendosa* BECHYNÉ, 1947), almost purely black, at most with very feeble bronzy metallic reflex only (ab. *nigerrima* WEISE, 1882), pronotum black-green, elytra cupreous (ab. *hiemata* BECHYNÉ, 1947), pronotum black-blue, elytra black-green (ab. *islandica* GERMAR, 1824), pronotum black-blue, elytra dark violaceous (ab. *conducta* BECHYNÉ, 1947), pronotum black-blue, elytra pure black (ab. *urgens* BECHYNÉ, 1947), pronotum sides almost straight (ab. *quadricollis* WEISE, 1882). Six subspecies are described: body relatively large (usually 7.0–8.0 mm), elytral punctures strong, irregular, ab. *prunicea* predominate (subsp. *ahena* GERMAR, 1824, from north-eastern Alps), smaller, variable, relatively strongly punctured (nominotypical subspecies, from Western and Central Sudetes), vertex sparsely, but strongly punctured, elytra stronger widened (subsp. *moraviaca* WEISE, 1882, from Eastern Sudetes, Altvater and Tatra), small (usually 5.5–6.0 mm), along lateral margin of elytra run a regular row of punctures (subsp. *havelkai* BECHYNÉ, 1949, from western Slovakia), along suture run a impressed, punctured stripe (a uncertain subsp. *suturalis* BECHYNÉ, 1947, from Eastern Carpathians), length 5.0–6.5 mm, upper side feebly shining, pronotum distinctly finer punctured than elytra (subsp. *hipaea* WEISE, 1898, from Southern Carpathians). Distributed in north-eastern Alps, Sudetes and Carpathians ..... (*Heliostola*) ***lichenis*** (RICHTER, 1820).
- . Longitudinal impression separating swollen lateral borders of pronotum densely covered by very strong punctures, whereas central part is very finely punctulate. Upper side dark red with intense cupreous-purplish sheen. Aedeagus as in figs **2527, 2528**. Length 6.9–9.7 mm. Distributed in Sardinia and Corsica ..... (*Synerga*) ***suffriani*** (FAIRMAIRE, 1859).

### Auxiliary group **H**

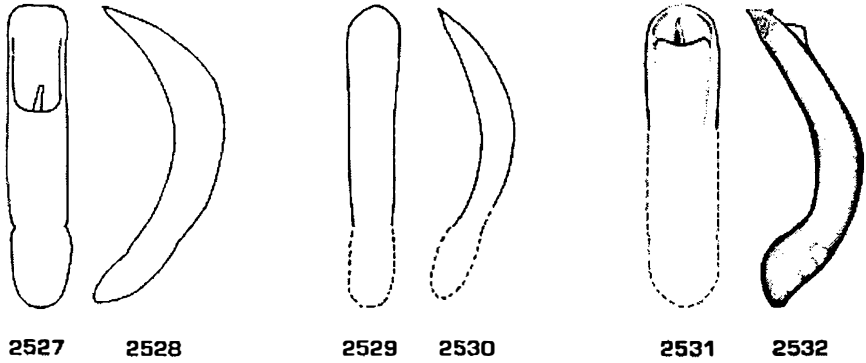
Pronotum trapezoidal, its lateral sides almost straight.

#### Key to species

1. Lateral border of pronotum near hind angles separate from central part by a furrow or punctured impression ..... **2**.
- . Lateral border also posteriorly not separate from central part or separate only by a not impressed stripe of points ..... **4**.
2. Puncturation of elytra double, very dense, partly confluent. Primary punctures here and there arranged in indistinct longitudinal rows, secondary punctures relatively

strong (as strong as puncturation of central part of pronotum). Upper side and legs black with feeble, blue or blue-violaceous sheen. Aedeagus as in figs 2529, 2530. Length 7.0–8.0 mm. Described from France .....  
 ..... (*Maenadochrysa*) *aveyronensis* BECHYNÉ, 1950.

- Puncturation of elytra rather sparse, never confluent ..... 3.



Figs 2527-2532. Aedeagus in dorsal and lateral view (2531, 2522 after BOURDONNÉ 1999, remaining after BECHYNÉ 1950): 2527, 2528 – *Chrysolina* (*Synerga*) *suffriani*; 2529, 2530 – *C. (Maenadochrysa) aveyronensis*; 2531, 2532 – *C. (M.) affinis*.

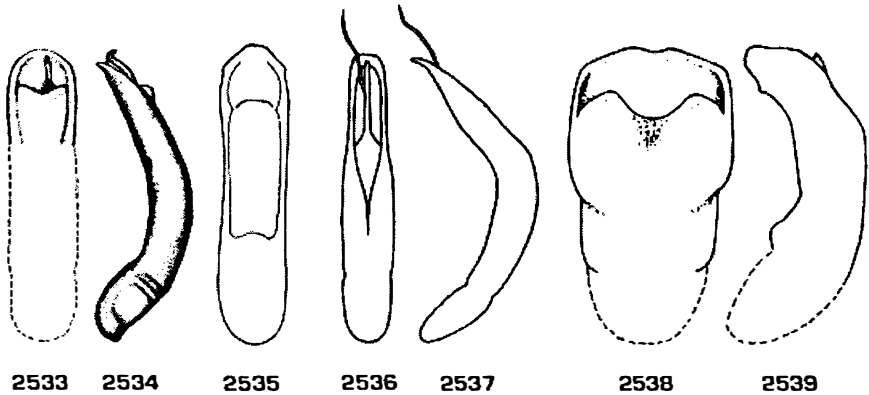
3. Secondary punctures of elytra very sparse, distinctly less numerous than the primary. On central part of pronotum punctures very fine, distinctly finer than secondary punctures of elytra. Upper side black with feeble, blue, blue-greenish or dark bronzy metallic reflex. On legs metallic reflex usually blue or blue-violaceous. Femora often red. Aedeagus as in figs 2531, 2532. Length 7.0–10.0 mm. Very variable, forms numerous aberrations and local races. Several subspecies are described: puncturation of elytra very irregular, punctures partly foveiform. Femora in female usually red, in male often violaceous (subsp. *rufofemorata* HEYDEN, 1870 = *vicinitatis* BECHYNÉ, 1950), puncturation of pronotum stronger than in nominotypical subspecies, metallic reflex of upper side bronzy or absent, femora red (subsp. *indomita* BECHYNÉ, 1950 = *hecateia* BECHYNÉ, 1950, from central Spain), antennae only feebly thickened apically, sexual dimorphism distinct, body larger, upper side dark blue (subsp. *bruttiana* BOURDONNÉ, 1999, from southern Italy), on elytra intervals everywhere entirely flat, metallic reflex of upper side bronzy, legs entirely violaceous (subsp. *xanthophryna* BECHYNÉ, 1950, from Tunisia), intervals, particularly laterally, slightly wavy or corrugate, puncturation of pronotum extremely fine, femora red (nominotypical subspecies, from Algeria), puncturation on pronotum stronger, whereas on elytra finer than in *affinis* s. str., body on average smaller, 6.5–8.0 mm, femora red (subsp. *caliginosa* OLIVIER, 1807, from southern France), puncturation of upper side stronger than in *affinis* s. str., body on average larger, 7.0–10.0 mm, femora red (subsp. *baetica* SUFFRIAN, 1851, from southern Spain, recently often considered as a distinct species, aedeagus as in figs 2531, 2532), body on average larger, upper side usually

bluish-violaceous or bluish-black, femora black or bluish-black (subsp. *hyacinthina* SUFFRIAN, 1851, from Sicily). Moreover 4 forms, perhaps local races, are described: primary punctures partly strong, arranged in geminate rows, masked by strong secondary puncturation, legs black with metallic reflex (?subsp. *pseudoaenea* FAIRMAIRE, 1865, from northern Morocco), as *pseudoaenea*, but femora red (?subsp. *mesatlantica* KOCHER, 1958), elytral puncturation dense, moderately strong, entirely irregular, femora red (?subsp. *atlantica* ESCALERA, 1914, from southern Morocco), elytral puncturation dense, double, entirely irregular, body less stout, femora red (?subsp. *lepineyi* KOCHER, 1958), from High Atlas. Distributed in north-western Africa, Iberian Peninsula, Sicily, southern Italy and southern France. Subsp. *baetica* is considered to be a distinct species by some authors .....

..... (*Maenadochrysa*) ***affinis*** (FABRICIUS, 1787).

- Secondary punctures on elytra at least as numerous as the primary. On central part of pronotum punctures stronger, rather not finer than secondary punctures of elytra. Aedeagus as in figs 2533, 2534. Length 7.0–9.0 mm. Variations: body black, with very feeble, bronzy, metallic reflex, femora red (ab. *collita* BECHYNÉ, 1950), elytra violaceous, pronotum bluish-violaceous, femora red (ab. *anquisita* BECHYNÉ, 1950), femora black with metallic sheen (ab. *balanyensis* BECHYNÉ, 1950). Eleven subspecies (more likely local forms) are described. The most important: upper side pitchy or bluish-black, femora red (subsp. *confusa* SUFFRIAN, 1851 from southern France), upper side and underside blue-black, femora red (subsp. *varipes* SUFFRIAN, 1851 = *laeticula* WEISE, 1916, from southern France), lateral sides of pronotum straight (nominotypical subspecies = *camena* BECHYNÉ, 1950, from southern France), lateral sides of pronotum slightly rounded, body more elongate, upper side almost matt, femora red (subsp. *tagenii* HERRICH-SCHÄFFER, 1838, from Basses Alpes), like *tagenii*, but upper side more shining (subsp. *bargusiana* BECHYNÉ, 1950, from north-eastern Spain). Distributed in northern Spain, southern France and in Italy .....

..... (*Maenadochrysa*) ***femoralis*** (OLIVIER, 1790).



Figs 2533-2539. Aedeagus in dorsal and lateral view (2533, 2534 after BOURDONNÉ 1999; 2535 after BREIT 1919; remaining after WARCHAŁOWSKI 1993): 2533, 2534 - *Chrysolina* (*Maenadochrysa*) *femoralis*; 2535 - *C. (Colaphoptera) planicollis*; 2536, 2537 - *C. (C.) umbratilis*; 2538, 2539 - *C. (Colaphodes) haemoptera*.

4. Upper side extremely finely punctate. Body black, upper side with violaceous, metallic sheen, underside of two basal antennomeres reddish. Aedeagus as in fig. **2535**. Length about 7.0 mm. Distributed in north-western Turkey and in Caucasian countries ..... (*Colaphoptera*) ***planicollis*** (BREIT, 1919).
- . Puncturation of upper side not particularly fine, sometimes moderately strong ... **5**.
5. Inner side of fore tibiae slightly but distinctly bent. Body usually pure or almost pure black. Upper side rather finely punctured. Aedeagus as in figs **2536**, **2537**. Length 7.8–9.6 mm. Variations: upper side with dark, green olive, metallic reflex (ab. *olivicolor* WEISE, 1916), upper side with greenish-cupreous metallic reflex (ab. *olivaceocuprea* BECHYNĚ, 1950). Distributed in Schwarzwald, Erzgebirge, Sudetes and Carpathians, reported also from Eastern Alps, Dinaric Alps and Istria ..... (*Colaphoptera*) ***umbratilis*** (WEISE, 1887).
- . Inner side of fore tibiae straight ..... **6**.
6. Aedeagus in lateral view doubly crooked as in fig. **1451**, see *vernalis* subsp. *pyrenaica*, group G, antithesis 7 ..... **7**.
- . Aedeagus not crooked, particularly short and broad (figs **2538**, **2539**). Outline of pronotum as in fig. **2540**. Upper side black with weak metallic reflex. Puncturation of elytra not decidedly double, secondary punctures moderately dense. Primary punctures here and there form short, irregular longitudinal rows. Length 6.4–10.0 mm (= *atra* GOEZE, 1777, *hottentotta* FABRICIUS, 1792, *acuticollis* FAIRMAIRE, 1877). Variations: upper side black-blue (typical form), upper side dark bronzy (ab. *cameranoi* PLOTI, 1880), upper side with feeble bronzy-greenish reflex (ab. *subaenea* DUFTSCHMID, 1825), punctures of upper side stronger deepened, metallic reflex violaceous (ab. *rugosopunctata* PORTA, 1934). Includes 4 subspecies: upper side intensively blue-black, strongly shining, body relatively slender, length 8.0–10 mm (subsp. *corvina* WEISE, 1916, from Italy, Sicily, Corsica and Sardinia), upper side pure black or with very feeble bluish metallic reflex, almost matt, puncturation of elytra very shallow and fine, body relatively slender, length 7.0–9.0 mm (subsp. *byzantia* JOLIVET, 1951, from Asia Minor and neighbouring part of Balkans), upper side with dark bluish or dark bronzy metallic reflex, feebly shining, primary punctures of elytra shallow but rather strong, secondary punctures very fine, body length 8.0–9.0 mm (subsp. *persica* JOLIVET, 1951, from Transcaucasia = *thalassina* REICHE, 1858), upper side blue-black, shining, secondary punctures of elytra fine and sparse, body short and strongly convex, length 6.4–8.0 mm (nominotypical subspecies, from remaining part of area). Distributed from Portugal and southern England to southern part of Sweden and Finland, Asia Minor, Caucasian countries and Central Asia. Reported also from Himalaya ..... (*Colaphodes*) ***haemoptera*** (LINNAEUS, 1758).

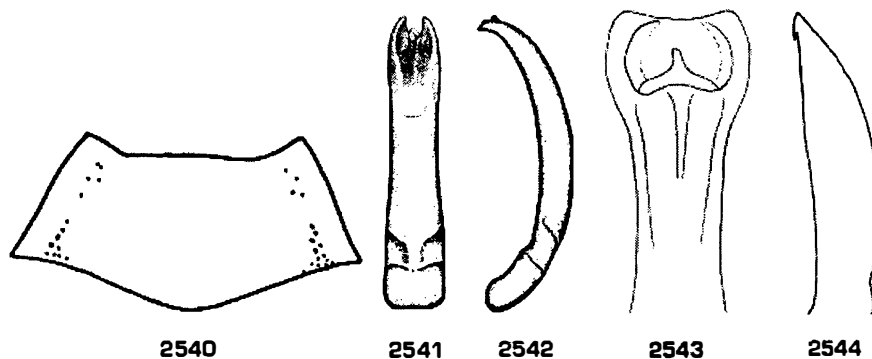
#### Auxiliary group I

Lateral border of pronotum separate basally by a furrow.

#### Key to species

1. Legs partly red ..... **2**.
- . Legs unicolorous ..... **3**.

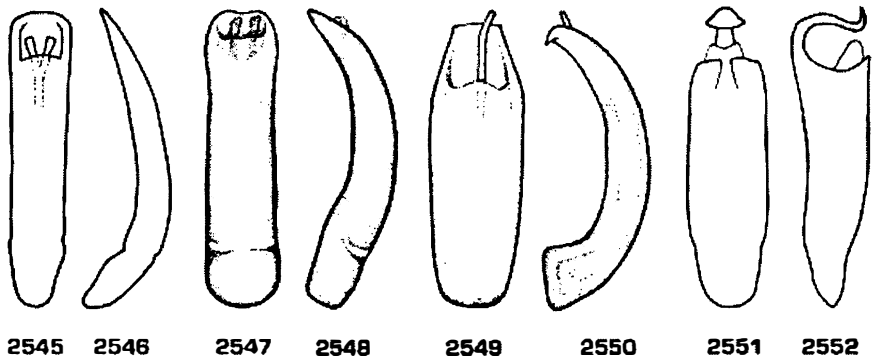
2. Femora red, tibiae black or black with metallic reflex. Here some specimens of *affinis baetica* with distinctly rounded lateral margins of pronotum (see group H, thesis 3).
- Femora and tibiae red. Body great, convex, black. Lateral borders of pronotum feebly convex, marginal furrows shallow. Punctures of elytra great, interstices on disc elevated. Aedeagus not studied. Length about 12.0 mm. Described from Algeria ..... (*Threnosoma*) ***rubricrus*** DESBROCHERS, 1899.
3. Pronotum narrowed posteriad, slightly sinuate before posterior angles, marginal furrow almost absent. Upper side black, feebly shining, underside and legs black with bluish reflex. Primary puncturation of elytra rather strong and dense, secondary punctures fine and sparce. Aedeagus not studied. Length 6.5–9.0 mm. Described from eastern Pyrenees ..... (*Maenadochrysa*) ***timarchoides*** (BRISOUT, 1882).
- Pronotum neither narrowed posteriad, nor sinuate before posterior angles ..... 4.
4. Upper side feebly shining or matt, black or with feeble metallic reflex, body large and strongly convex, length usually over 10.0 mm, legs usually with blue or violaceous reflex, rarely pure black ..... 10.
- Not with above combination of characters ..... 5.
5. In male last abdominal segment with a deep, longitudinal median furrow, flagellum bifurcate ..... 6.
- In male last abdominal segment without a deep median furrow, flagellum not bifurcate ..... 9.
6. Lateral furrow on pronotum distinctly interrupted in the middle ..... 8.
- Lateral furrow on pronotum not distinctly interrupted in the middle. Upper side black, elytra feebly shining, their punctures randomly scattered ..... 7.



Figs 2540-2544. Aedeagus in dorsal and lateral view; pronotum (2540 after WARCHALOWSKI 1993; 2541, 2542 after DACCORDI and RUFFO 1990; 2543, 2544 after MEDVEDEV 1992): 2540 – *Chrysolina* (*Colaphodes*) *haemoptera*; 2541, 2542 – *C. (Bechynia) platypoda*; 2543, 2544 – *C. (Allohypericia) koltzei*.

7. Species from W Europe. In male first antennomeron of fore tarsi broader, than apex of tibia. Apex of aedeagus (figs 2541, 2542) deeply incised. Length 9.5 mm. Distributed in southern France ..... (*Bechynia*) ***platypoda*** BECHYNĚ, 1950.

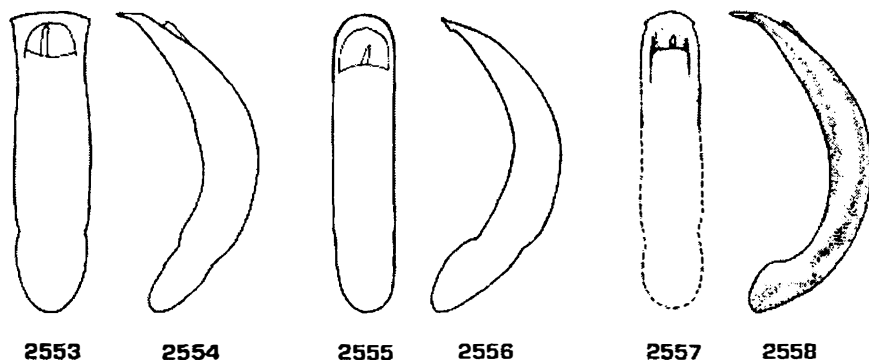
- Species from E Siberia. Primary puncturation of elytra moderately strong, here and there arranged in longitudinal subgeminata rows. Upper side black with weak metallic reflex (nominotypical subspecies). Secondary puncturation strong, about two times finer than the primary puncturation. Aedeagus as in figs 2543, 2544. Length 5.8–8.0 mm. Forms three subspecies, externally differing by colouration of upper side: upper side pitchy black without metallic reflex (subsp. *brunneipennis* MATSUMURA, 1911), upper side with deep blue or violaceous metallic reflex (subsp. *lamii* TAKIZAWA, 1970). Distributed from NW China to Ussuria, Kuril Islands and Japan, subsp. *brunneipennis* known from Sakhalin, subsp. *lamii* from Ussuria, Kurile Isl. and Japan (Hokkaido) ..... (*Allohypericia*) **koltzei** (WEISE, 1887).
- 8. Upper side black, apex of aedeagus (figs 2545, 2546) not incised. Length 8.0–10.0 mm. Distributed in northern Croatia and in Slovenia ..... (*Bechynia*) **milleri** (WEISE, 1894).
- Upper side black with bronzy reflex, apex of aedeagus slightly emarginate (figs 2547, 2548). Length about 8.3 mm. Described based on one male specimen from Peloponnese (mts. Taigetos) only ..... (*Bechynia*) **philotesia** DACCORDI et RUFFO, 1980.



Figs 2545-2552. Aedeagus in dorsal and lateral view (2545, 2546 after WARCHALOWSKI 1993; 2547-2550 after BOURDONNÉ 1981; 2551, 2552 after WARCHALOWSKI 2003): 2545, 2546 – *Chrysolina* (*Bechynia*) *milleri*; 2547, 2548 – *C. (B.) philotesia*; 2549, 2550 – *C. (Colaphodes) bigorrensis*; 2551, 2552 – *C. (Ovosoma) sahlbergi*.

- 9. Body black, rarely with very feeble greenish metallic reflex on pronotum puncturation of elytra distinctly double, secondary punctures strong and dense. Length 6.5–8.4 mm. Distributed in Pyrenees Here *C. vernalis* subsp. *pyrenaica* (DUFOUR, 1843, see auxiliary group G, antithesis 7).
- Upper side black with bluish reflex. Aedeagus as in figs 2549, 2550. Length 8.5–10.0 mm. Distributed in Pyrenees ..... (*Colaphodes*) **bigorrensis** (FAIRMAIRE, 1865).
- 10. Hind part of lateral border of pronotum separated by a short, purely incised, impunctate furrow. Pronotum matt, extremely finely punctulate or apparently im-

- punctate. Upper side with feeble, silky, bronzy-green metallic relex. Primary punctures of elytra sparse, arranged in indistinct, geminate, longitudinal rows; each puncture surrounded by a little shining, black, blue or violaceous area. General view as in plate LXIV, **phot. 573**. Aedeagus as in figs **2551, 2552**. Length 7.5–9.0 mm. (= *cupreopunctata* REICHE, 1858, *venefica* WEISE, 1884). Distributed in Asia Minor, Cyprus, Caucasian countries and Iran ..... (*Ovosoma*) ***sahlbergi*** (MÉNÉTRIÉS, 1832).
- . Hind part of lateral border separated by a short punctured furrow or deep, punctured impression ..... **11**.
  - 11. Pronotum matt, extremely finely and shallowly punctulate ..... **12**.
  - . Puncturation of pronotum distinct, moderately fine, deep and rather dense .... **14**.
  - 12. European species. Upper side bluish black ..... **13**.
  - . North-African species ..... **15**.
  - 13. Iberian species. Upper side black with feeble, bluish, metallic reflex. Lateral sides of pronotum distinctly rounded, lateral sides of elytra in middle part subparallel. Aedeagus as in figs **2553, 2554**. Length 10.0–12.5 mm. Variation: sides of pronotum feebly rounded, lateral sides of elytra in middle part not subparallel (ab. *korbi* WEISE, 1891). Distributed in Iberian Peninsula, reported also from Algeria ..... (*Threnosoma*) ***helopioides*** (SUFFRIAN, 1851).
  - . Species from basin of Danube and eastern Carpathian area ..... **16**.

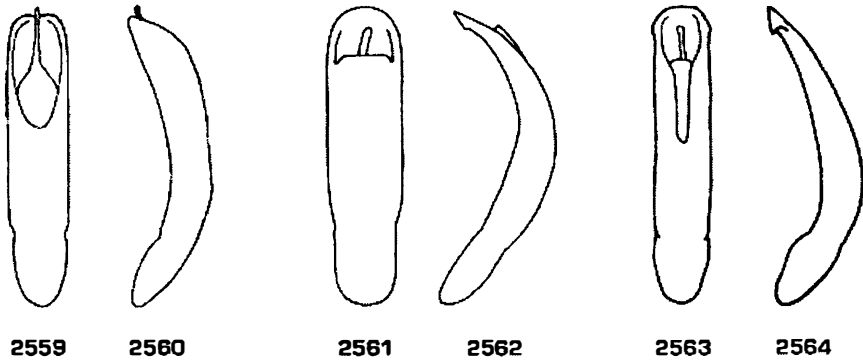


Figs 2553–2558. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 2003): 2553, 2554 – *Chrysolina* (*Threnosoma*) *helopioides*; 2555, 2556 – *C. (T.) afra*; 2557, 2558 – *C. (T.) obscurella*.

- 14. Primary punctures reaches lateral margin of elytra. Aedeagus not studied. Length 9.0–10.0 mm. Described from southern Carpathians, perhaps a local form of *fimbrialis* group D, thesis 11) ..... (*Threnosoma*) ***obenbergeri*** BECHYNÉ, 1950.
- . Primary punctures on elytra separated from lateral margin by a broad impunctate interval. Here *fimbrialis* ab. *hungarica* (group D, thesis 11).
- 15. On pronotum lateral impression very short (under 0.3 of pronotum length), lateral thickenings of pronotum sometimes swollen also in anterior part. Body usually pitchy or very dark reddish-brown. Primary punctures of elytra strong but shallow,



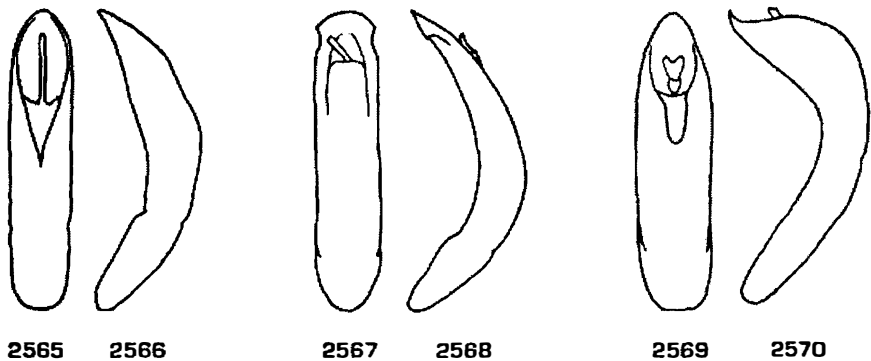
- interstices on average 2.0–2.5 × broader than diameter of punctures. Aedeagus not studied. Length 10.5–13.0 mm (= *pertusa* FAIRMAIRE, 1865). Described from Algeria ..... (*Threnosoma*) ***tortipennis*** (FAIRMAIRE, 1865).
- . On pronotum lateral impression much longer (more than 0.5 of pronotum length). Primary punctures of elytra finer, rather deeply impressed, interstices on average 2.5–3.5 × broader than diameter of punctures. Aedeagus as in figs **2555**, **2556**. Length 10.5–13.0 mm (?= *scorodon* MARSEUL, 1886). Forms two subspecies: lateral impression on pronotum and primary sculptures as above (nominotypical subspecies), lateral impression of pronotum somewhat shortened, primary punctures on elytra stronger (subsp. *maritima* PEYERIMHOFF, 1938, from coastal area of N Algeria). Distributed in Morocco, Algeria and Tunisia. Here belong probably also two insufficiently studied taxons: *solata* (FAIRMAIRE, 1879) and *scorodon* (MARSEUL, 1886) ..... (*Threnosoma*) ***afra*** (ERICHSON, 1841).
16. Puncturation of pronotum and elytra not significantly different. Primary punctures on elytra very fine, uniform and dense. Aedeagus as in figs **2557**, **2558**. Length 9.1–11.2 mm (= *pelagica* BECHYNÉ, 1950). Forms two subspecies: upper side black, very matt (nominotypical subspecies from W Alps and Liguria), upper side black-blue, rather shining (subsp. *remigrata* BECHYNÉ, 1950 from Alpes Maritimes). Distributed in SE France and NW Italy ..... (*Threnosoma*) ***obscura*** (SUFFRIAN, 1851).
- . Puncturation of pronotum and elytra very different ..... **17**.



Figs 2559–2564. Aedeagus in dorsal and lateral view (2559, 2560 after KIPPENBERG in litt.; 2561, 2562 after WARCHALOWSKI 2003; 2563, 2564 after WARCHALOWSKI 1993): 2559, 2560 – *Chrysolina* (*Chrysolina*) *obsoleta*; 2561, 2562 – *C. (Threnosoma) arambourgi*; 2563, 2564 – *C. (Ovostoma) olivieri*.

17. **Canarian species.** On central part of pronotum puncturation extremely fine, barely perceptible. Primary punctures on elytra rather sparse, shallow, arranged in indistinct longitudinal rows. Upper side dark brown, pitchy or black, metallic reflex absent or extremely feeble. Aedeagus as in figs **2559**, **2560**. Length 8.9–10.4 mm. Endemic to Canarian Islands ..... (*Chrysolina* s. str.) ***obsoleta*** (BRULLÉ, 1838).
- . **European and African species** ..... **18**.

18. African species. Entirely black, on legs blue metallic reflex barely perceptible. Pronotum distinctly but very finely punctulate, primary punctures of elytra much stronger, but shallow. Aedeagus as in figs **2561**, **2562**. Length 8.7–10.2 mm. Described from Algeria, probably endemic to Djurdjura Mts ..... (*Threnosoma*) ***arambourgi*** (PEYERIMHOFF, 1931).
- . European species ..... **19**.
19. Underside and legs with distinct metallic sheen, usually blue, rarely violaceous or greenish. In typical forms upper side shining. General view as in plate LXIV, **phot. 574**. Aedeagus as in figs **2563**, **2564**. Length 8.5–13.0 mm (= *coerulea* OLIVIER, 1807, nec 1790). Seven subspecies (partly ranked also to *globipennis*, group J, thesis 7) are described: upper side matt, length 8.5–10.0 mm (subsp. *subalpina* CSIKI, 1953, from southern Carpathians), pronotum matt, very finely and densely punctured, elytra shining (subsp. *collina* CSIKI, 1953, from Hungary and Transylvania), pronotum subtrapezoidal (subsp. *ehumerosa* BECHYNÉ, 1950, from Bosnia-Herzegovina), lateral sides of pronotum very feebly rounded (subsp. *veneta* MÜLLER, 1948, from eastern Alps), on pronotum lateral furrow long, reaching to its middle (subsp. *montanella* BECHYNÉ, 1950, from Serbia), elytra densely punctured, length 9.5–12.0 mm, blue-black forms predominate (nominotypical subspecies, from eastern Balkans), elytra not particularly densely punctured, blue or violaceous forms predominate (subsp. *slovaca* BECHYNÉ, 1946, from southern Slovakia). Distributed in Alps, Dinaric Alps, southern Carpathians and Stara Planina ..... (*Ovostoma*) ***olivieri*** (BEDEL, 1892).
- . Body black, bluish reflex on legs often imperceptible, upper side moderately shining ..... **20**.



Figs 2565-2570. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1993): 2565, 2566 – *Chrysolina* (*Colaphoptera*) *marcasitica*; 2567, 2568 – *C. (Threnosoma) cribrosa*; 2569, 2570 – *C. (Euchrysolina) graminis*.

20. Underside and legs dark brown or pitchy without metallic reflex. Upper side pitchy brown or almost black with feeble metallic reflex. Punctures of elytra in anterior half strong, in posterior part finer and more dense. Aedeagus as in figs **2565**, **2566**.

Length 7.0–9.5 mm. Variations: metallic reflex of upper side dark bronzy (typical form), purplish-cupreous (ab. *cupreopurpurea* GERHARDT, 1909) or very feeble, dark olive (ab. *pannonica* WEISE, 1882). Includes 3 subspecies: lateral sides of pronotum in hind and middle part parallel, anteriorly strongly rounded, length 7.0–7.5 mm (subsp. *dissipalpis* BECHYNÉ, 1950, from Slovenia), pronotum widest at base, its lateral sides rather regularly rounded, length 7.5–9.0 mm, ab. *cupreopurpurea* predominate (nominotypical subspecies, from western and northern Alps), similar to *marcasitica* s. str., but pronotum widest before base (subsp. *turgida* WEISE, 1882, from Sudetes and Carpathians). Distributed in mentioned areas ..... (Colaphoptera) **marcasitica** (GERMAR, 1824).

- . Body black ..... 21.
- 21. Aedeagus as in figs 2567, 2568. Includes 2 subspecies: length 10.0–13.0 mm, on elytra interstices strongly convex, secondary punctures numerous and distinct (nominotypical subspecies, from Istria and Croatia), length 8.5–11.0 mm, on elytra interstices less convex, secondary punctures sparse (subsp. *sirentensis* MEIER, 1900 = *maestitalis* BECHYNÉ, 1950), from central and southern Italy). Distributed in mentioned areas ..... (*Threnosoma*) **cribrosa** (AHRENS, 1812).
- . Very similar to *cribrosa* (thesis 21), but on elytra interstices flat. Aedeagus as in *inflata* (auxiliary group G., thesis 21). Length 9.0–10.0 mm. Described from Italian Alps (Alpi Apuani) ..... (*Threnosoma*) **osellai** DACCORDI, 1979.

#### Auxiliary group J

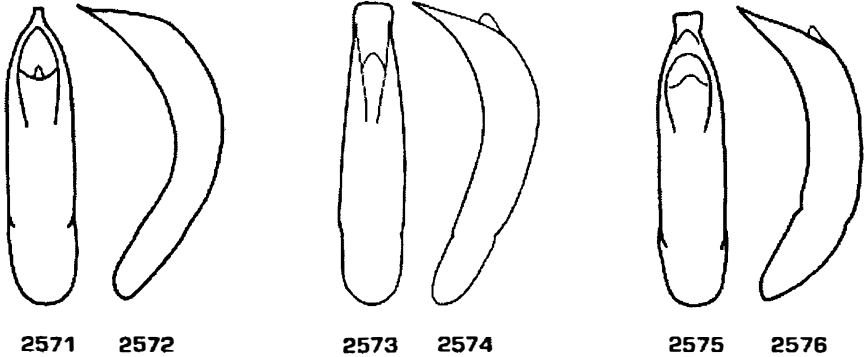
Lateral border of pronotum separate basally by a stripe of points.

#### Key to species

1. Body black with usually distinct metallic, greenish or bluish reflex, elytra coppery or golden-red with green or bluish borders ..... 2.
- . Body differently coloured ..... 3.
2. Impression separating lateral borders of pronotum from disc longer, sometimes reaching to the midlength. Aedeagus similar as in *sogdiorum* (auxiliary group E, thesis 122). General view as in plate LXIV, phot. 575. Length 6.1–9.2 mm. Distributed in Kamchatka and Ussuria ..... (*Chrysocrosita*) **spectabilis** (MOTSCHULSKY, 1860) s. str.
- . Impression separating lateral borders of pronotum from disc very short, not reaching to 1/3 of length. Length 6.2–8.9 mm. Forms two variations: black parts of body with deep blue reflex (typical form); black parts of body with green, usually somewhat more vivid reflex (ab. *viridipurpurea* MEDVEDEV, 1975). Distributed in Sayan Mountains and in N Mongolia ..... (*Chrysocrosita*) **spectabilis** subsp. **polychroma** MEDVEDEV, 1975.
3. Upper side with intense green or blue metallic gloss, ground reticulation on disc of elytra absent or perceptible in hind part only ..... 4.
- . Upper side with rather feeble metallic sheen, ground reticulation on disc of elytra usually well-developed ..... 8.

4. Upper side green, elytra with a narrow, greenish-blue stripe along suture and with broad, differently coloured (golden-red, golden-green, at least reddish) lateral stripe ..... 5.
- . Elytra without a distinct differently coloured lateral stripe ..... 6.
5. Thickened lateral borders of pronotum not always distinctly separated from disc, lateral furrow shallow, often interrupted in the middle or almost absent. On average smaller. Punctures on pronotum laterally very strong, on central part much finer. Behind humeral callus is situated a distinct, transverse impression. Aedeagus as in figs **2569**, **2570**. General view as in plate LXIV, **phot. 576**. Length 7.5–12.0 mm. Variations: upper side green, sutural stripe and a longitudinal spot on each elytron violaceous (ab. *semiviolacea* MALLET, 1924), upper side golden-cupreous, sutural stripe and longitudinal spot (sometimes with a violaceous center) on each elytron green (ab. *fulgida* FABRICIUS, 1801), upper side mostly cupreous (ab. *edomita* BECHYNÉ, 1950), underside dark bronzy, upper side black with feeble cupreous sheen, lateral stripe greenish-blue (ab. *nigrocyanea* MALLET, 1924), elytra bronzy-red, lateral stripe and pronotum green (ab. *taupini* MALLET, 1924). In Western Palaearctic includes 4 subspecies: body slender, sides of elytra almost parallel (subsp. *santonici* CONTARINI, 1847, from southern foothills of Central Alps), lateral borders of pronotum in hind part distinctly swollen (subsp. *artemisiae* MOTSCHULSKY, 1860, from Ukraine, southern Russia and Central Asia), lateral borders of pronotum entirely flat, without swelling (subsp. *mediterranea* BECHYNÉ, 1950, from southern France, Corsica and Italy, here probably also ?subsp. *christianae* MALLET, 1933 and ?subsp. *rugulosa* MALLET, 1933 from France), lateral borders of pronotum feebly swollen, but perceptible (nominotypical subspecies from the remaining part of area). Distributed from Pyrenees, south-western England and northern Sweden to basins of Black- and Caspian Sea, Central Asia, Mongolia and northern China ..... (*Euchrysolina*) ***graminis*** (LINNAEUS, 1758).
- . Thickened lateral borders of pronotum strongly convex, distinctly separated from disc by deep, almost straight furrow. Externally rather similar to *graminis* (thesis 5), but on average larger. General view as in plate LXV, **phot. 577**. Length 9.0–14.0 mm (= *eximia* BALY, 1862). Variation: green stipe running along each elytron very dark, brown-green (ab. *obscurofasciata* JACOBY, 1885). Distributed in N China, Korea and Japan ..... (*Euchrysolina*) ***virgata*** (MOTSCHULSKY, 1860).
6. Aedeagus apically narrowed, its apex broadly, almost transversely cut ..... 7.
- . Aedeagus (figs **2571**, **2572**) not broadly, transversely cut. Upper side usually blue or blue-violaceous, more rarely green or golden-green. Variations: upper side blue or blue-violaceous without longitudinal stripes (typical form), upper side green with blue-violaceous (on pronotum 3, on each elytron also 3: lateral- median- and sutural) longitudinal stripes (ab. *starhorni* REITTER, 1912), upper side ground bronzy-cupreous, longitudinal stripes as in *starhorni* (ab. *subfastuosa* MOTSCHULSKY, 1860), head golden-green, pronotum purplish with 3 longitudinal violaceous stripes, elytra bronzy-violaceous with purplish or cupreous stripes (ab. *mimeomicans* BECHYNÉ, 1950), upper side golden-green, without distinct longitudinal stripes (ab. *evittata* BECHYNÉ, 1950), upper side black with feeble greenish olive metallic reflex (ab. *olivaceonigra* FLEISCHER, 1892). Includes 5 subspecies: puncturation of elytra in lateral and hind part not distinctly finer as on disc, typical form predominate (nominotypical subspecies, from Europe and Asia Minor), Puncturation of elytra

strong, in lateral and hind part distinctly finer as on disc, ab. *subfastuosa* predominate (subsp. *uzbekorum* BECHYNÉ, 1950, from Central Asia), upper side finely punctured, cupreous-purplish, pronotum matt, at basal margin with 3 golden-green spots, on elytra sutural and median stripe blue-violaceous with golden-green borders (subsp. *splendorifera* MOTSCHULSKY, 1860, from Caucasian countries and northern Iran), pronotum shining, ab. *subfastuosa* predominate (subsp. *angelica* REICHE et SAULCY, 1858, from Mesopotamia), pronotum shining, upper side finely punctate, uniformly metallic green (subsp. *relicta* MEDVEDEV, 1977, from Ural). Distributed from central France, Balkans and northern parts of Germany and Poland to Central Asia ..... (*Synergia*) ***coerulans*** (SCRIBA, 1791).



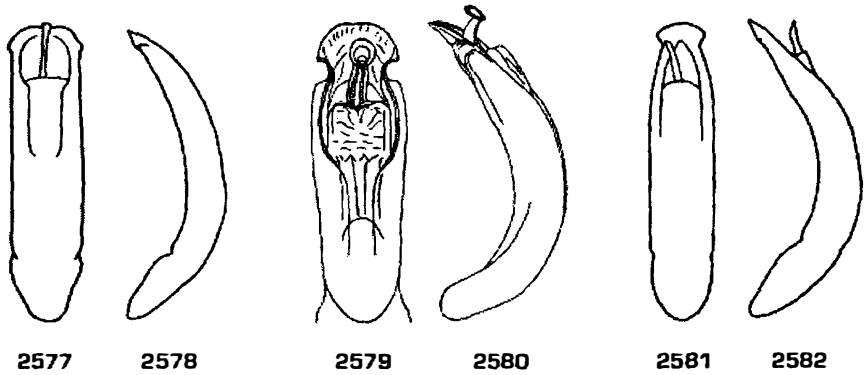
Figs 2571-2576. Aedeagus in dorsal and lateral view (2573, 2574 after BECHYNÉ 1950, remaining after WARCHAŁOWSKI 1993): 2571, 2572 – *Chrysolina* (*Synergia*) *coerulans*; 2573, 2574 – *C. (S.) viridana*; 2575, 2576 – *C. (S.) herbacea*.

- 7. Central part of pronotum very finely punctulate, sometimes almost smooth. Upper side green or golden-green with metallic sheen. Aedeagus as in figs 2573, 2574. Length 6.0–8.5 mm (= *palustris* SUFFRIAN, 1851). Variations: upper side golden-cupreous (ab. *algecirensis* BECHYNÉ, 1950), bluish-green (ab. *pseudochloris* BECHYNÉ, 1950), green or golden-green (typical form) dark green olive (ab. *sardea* WEISE, 1884) or cupreous with golden or purplish reflex (ab. *aurocuprea* FAIRMAIRE, 1865). Includes two subspecies: length 6.0–7.5 mm, body rather stout, elytral punctures finer, ab. *pseudochloris*, *sardea* and *aureocuprea* predominate (nominotypical subspecies, from Sardinia and Corsica), length 7.0–8.5 mm, body more slender, typical form predominate (subsp. *chloris* LUCAS, 1849, from remaining part of area). Distributed in North Africa, southern Spain, Corsica, Sardinia, Sicily and southern Italy ..... (*Synergia*) ***viridana*** (KÜSTER, 1844).
- . Central part of pronotum fine or moderately strong, but always distinctly punctate. Upper side usually green or golden-green. General view as in plate LXV, phot. 578. Aedeagus as in figs 2575, 2576. Length 7.0–10.5 mm (= *menthastri* SUFFRIAN, 1851, *fulminans* SUFFRIAN, 1851). Variations. Upper side shining, green with golden reflex (typical form), green olive (ab. *solistima* BECHYNÉ, 1950), cupreous with gold-

en reflex (ab. *resplendens* SUFFRIAN, 1855), cupreous-purplish (ab. *cupreopurpurea* COSTA, 1838), blue (ab. *durabilis* BECHYNÉ, 1950) or violaceous (ab. *expectata* BECHYNÉ, 1950), elytra bluish green, pronotum cuperous-purplish (ab. *thoracica* BECHYNÉ, 1950), elytra blue green, pronotum green (ab. *rugicollis* WEIDENBACH, 1859); upper side matt, dark blue (ab. *cyaneonigra* BECHYNÉ, 1950), dark green (*elevarensis* BUYSSON, 1924) or dark green olive (ab. *croatica* WEISE, 1884). Four subspecies are described: aedeagus apically tapered, not narrowed before apex, length 8.5–11.0 mm (subsp. *talyshana* BECHYNÉ, 1950 from N Iran), sides of pronotum in basal half subparallel (subsp. *recticollis* MOTSCHULSKY, 1860 from Caucasian countries), outline of body more slender, sides of elytra subparallel (subsp. *caucasica* MOTSCHULSKY, 1860 from Caucasus). Puncturation of upper side finer than in nominotypical subspecies (subsp. *alacris* BECHYNÉ, 1950 from Asia Minor). Occurrence of *C. herbacea* s. str. in western Iran and in Caucasian countries suggests that remaining forms described from those areas, ranked as subspecies may turn out to be only local forms or their hybrids. Distributed in Europa to about 55<sup>th</sup> parallel, Asia Minor, Caucasian countries, northern Iran and Central Asia ..... (Synerga) *herbacea* (DUFTSCHMID, 1825).

8. Pronotum widest in anterior part ..... 9.

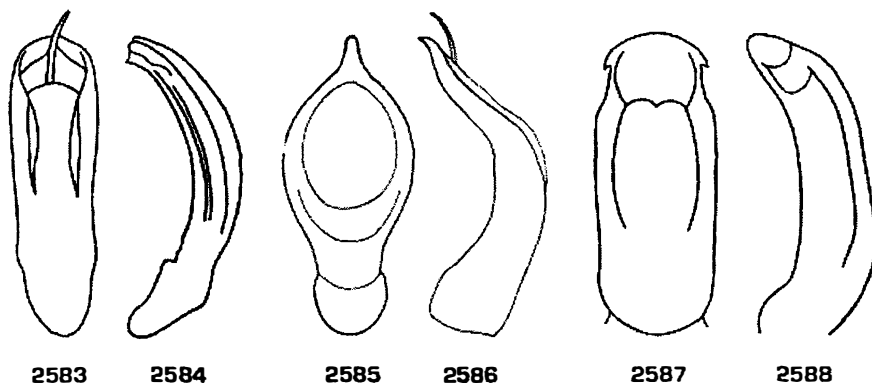
–. Pronotum widest near base or in the midlength, its sides rounded, narrowed anterior ..... 10.



Figs 2577-2582. Aedeagus in dorsal and lateral view (2577, 2578 after WARCHALOWSKI 1993; 2579, 2580 after MIKHAILOV 2002; 2581, 2582 after WARCHALOWSKI 2003): 2577, 2578 – *Chrysolina (Ovostoma) globipennis*; 2579, 2580 – *C. (Timarchoptera) lomakini*; 2581, 2582 – *C. (Threnosoma) weisei*.

9. European species. Sides of pronotum in hind 2/3 parallel or slightly convergent posteriad. Upper side usually black with purplish-violaceous sheen. Aedeagus as in figs 2577, 2578. Length 6.5–10.4 mm. Variations: metallic sheen of upper side purplish-violaceous (typical form) or black-green (ab. *marmarosensis* REITTER, 1912), bluish-violaceous (ab. *styriaca* BECHYNÉ, 1946), upper side bicolorous: pronotum purplish, elytra black-green (unnamed). Occurs as a few subspecies: length 8.0–10.4 mm, upper side relatively finely punctured, typical form predominate

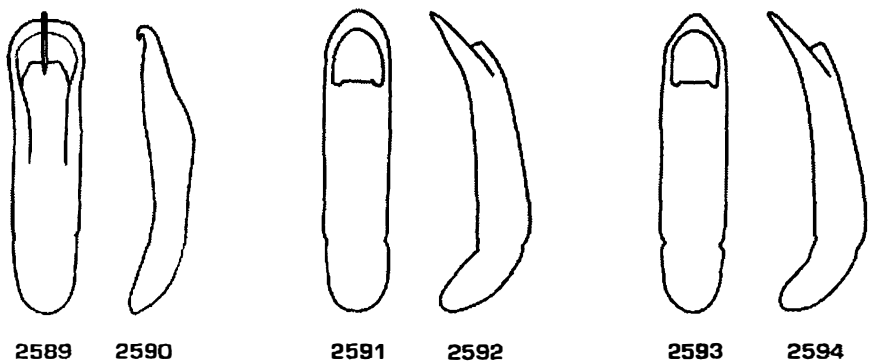
- (nominotypical subspecies, from remaining part of area), upper side rather strongly punctured, shining, length 6.5–7.5 mm (subsp. *euminuta* BECHYNĚ, 1950, from southern foothills of Tatra), upper side rather strongly punctured, matt, length 7.0–8.0 mm, ab. *styriaca* predominate (subsp. *deubeli* BECHYNĚ, 1948, from Southern Carpathians). The intraspecific classification of *C. globipennis* is still unclear in many respects. The species may perhaps represent only a northern subspecies of *C. olivieri* group I, thesis 19). Distributed in Western, Eastern and Southern Carpathians ..... (*Ovostoma*) ***globipennis*** (SUFFRIAN, 1851).
- . Asiatic species. Externally somewhat similar to representatives of the subgenus *Metallothymarcha* (p. 610). Upper side bronzy or bronzy with violaceous reflex. Aedeagus as in figs 2579, 2580. Length 7.8–9.1 mm. Described from Sayan Mountains ..... (*Timarchoptera*) ***lomakini*** MIKHAILOV, 2002.
10. Length over 8.0 mm. Body stout and strongly convex, black, upper side with very feeble metallic reflex. Pronotum significantly finer punctured than elytra. Lateral swellings of pronotum and longitudinal impressions entirely absent or present only as a short and shallow trace near base. Elytra strongly and densely, rather irregularly punctured. Aedeagus as in figs 2581, 2582. Length 8.0–9.5 mm. Probably endemic to Southern Carpathians ..... (*Threnosoma*) ***weisei*** (FRIVALDSZKY, 1883).
- . Length under 7.5 mm ..... 11.
11. Species from China ..... 12.
- . Species from W Asia and/or Europe ..... 14.



Figs 2583–2588. Aedeagus in dorsal and lateral view (2585, 2586 after LOPATIN 2000, remaining after LOPATIN 1998): 2583, 2584 – *Chrysolina* (*Pezocrosita*) *roborowskii*; 2585, 2586 – *C. (P.) lucti*; 2587, 2588 – *C. (P.) tani*.

12. Larger, body relatively slender, upper side weakly shining. Punctuation of elytra fine, in anterior half partly connected by fine wrinkles and arranged in longitudinal irregular rows resp. stripes ..... 13.
- . Smaller, body broader. Aedeagus as in figs 2583, 2584. Length 4.5–5.3 mm (= *fallax* JACOBSON, 1895). Described from NW China ..... (*Pezocrosita*) ***roborowskii*** (JACOBSON, 1895).

13. Tubular part of aedeagus (figs **2585**, **2586**) in the middle broadened with roundish sides, apex with long lamella. Length 6.3 mm. Female unknown. Described, based on one male only, from NW China (Sinkiang) .....  
 ..... (*Pezocrosita*) **luchti** LOPATIN, 2000.
- . Aedeagus (figs **2587**, **2588**) in dorsal view with two lateral teeth bat apex. Body black, upper side with weak golden reflex, three basal antennomeres reddish beneath, remaining antennomeres pitchy. Pronotum 2 × broader than long, finely punctured, scutellum almost smooth. Primary puncturation of elytra finer than on pronotum, somewhat indistinct, in hind part disappearing, in anterior part arranged in rather irregular rows. Length 7.0 mm. Described from China based on one couple only .....  
 ..... (*Pezocrosita*) **tani** LOPATIN, 1998.
14. Apex of aedeagus in lateral view strongly hooked. Body moderately short and stout, convex, in hind part, particularly in females, more or less widened. Hind wings well-developed, but humeral callus usually rounded. Aedeagus as in figs **2589**, **2590**. General view as in plate LXV, **phot. 579**. Length 4.5–6.0 mm (= *marshami* DONOVAN, 1790, *margarita* OLIVIER, 1798, *incerta* MEISSNER, 1907, *subaenea* SUFFRIAN, 1851, *ooensis* WEISE, 1916). Variations. Upper side unicolorous: metallic sheen green or bluish-green (typical form), bronzy-green (ab. *viridiaenea* MARSHAM, 1802), blue or violaceous (ab. *pratensis* WEISE, 1884), cupreous or purplish (ab. *centaura* HERBST, 1783), dark bronzy (ab. *aerifera* BECHYNÉ, 1950) or almost pure black (ab. *aethiops* FABRICIUS, 1792); upper side bicolorous: pronotum cupreous, elytra blue (ab. *pulchella* FLEISCHER, 1918), pronotum dark bronzy, elytra purplish-cupreous (ab. *nigricollis* MALLETT, 1936); lateral stripe of points on pronotum more distinct as normally (ab. *malleti* JACQUET, 1935). Distributed in most part of Europe, approximately between 42<sup>th</sup> and 64<sup>th</sup> parallel and in Western Siberia, moreover deliberately introduced in N America for biological control of weeds .....  
 ..... (*Sphaeromela*) **varians** (SCHALLER, 1783).
- . Apex of aedeagus in lateral view neither hooked nor bent ..... **15**.



Figs 2589-2594. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1993): 2589, 2590 – *Chrysolina* (*Sphaeromela*) *varians*; 2591, 2592 – *C. (Heliostola) carpathica* s. str.; 2593, 2594 – *C. (H.) carpathica gabrieli*.



15. European species. Body short and stout. Upper side rather feebly shining, black with feeble greenish or bluish metallic reflex, surface finely reticulate. Aedeagus as in fig. 1530, 1531. Length 6.0–7.3 mm. Variations: uperside black-blue, sometimes with very feeble purplish reflex (typical form), black with greenish-blue reflex (ab. *jaspidea* BECHYNĚ, 1947), black-violaceous (ab. *lucifuga* BECHYNĚ, 1947) or almost pure black (ab. *internitens* BECHYNĚ, 1947); lateral sides of pronotum feebly rounded and more converging anteriorly (ab. *hopffgarteni* WEISE, 1890). Includes two subspecies: on average larger, more stout, apex of aedeagus evenly rounded (figs 2591, 2592), ab. *jaspidea* predominate (nominotypical subspecies, from Sudetes and Northern Carpathians), on average smaller, apex of aedeagus approximately triangular (figs 2593, 2594), typical form predominate (subsp. *gabrieli* WEISE, 1903, from Eastern and Southern Carpathians, detected also in Bulgaria (Stara Planina) ... .. (*Helioctena*) ***carpathica*** (FUSS, 1856).
- . Species from Asia ..... 16.
16. Pronotum almost 2 × broader than long. Hind wings and humeral calli absent. Upper side black with greenish reflex, feebly shining, reticulation distinctly developed. Lateral thickenings of pronotum weakly separated from central part. In male first tarsomere of fore legs distinctly narrower than 3. See *katonica* (group E, antithesis 14).
- . Pronotum distinctly less than 1.6 × broader than long. Upper side more distinctly shining, greenish-black with somewhat cupreous reflex. In male first tarsomere of fore legs approximately as broad as 3. Here forms of *gibbipennis* (auxiliary group E, thesis 9) and *schewyrewi* (auxiliary group E, thesis 14) with indistinct primary punctures on elytra.

### Genus *Chrysomela* LINNAEUS, 1758

#### Key to subgenera

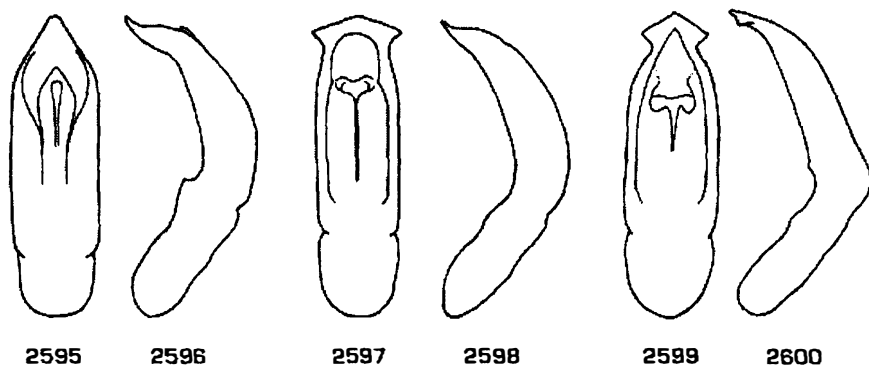
1. Elytra red, entirely or with blackened apex only, very rarely brown or blackish, always without metallic sheen ..... ***Chrysomela*** s. str. (p. 519).
- . Elytra with black pattern or entirely with metallic sheen ..... 2.
2. Elytra uniformly black with metallic reflex, lateral sides of pronotum broadly yellow or orange ..... ***Pachylina*** (p. 520).
- . Elytra bicolorous, reddish with characteristic pattern or upperside entirely black with metallic sheen ..... ***Strickerus*** (p. 521).

#### Subgenus *Chrysomela* s. str.

#### Key to species

1. Body greater, 10.0–12.0 mm long. Elytra red, their apex blackened. Remaining parts of body black with bluish or greenish metallic reflex, tibiae sometimes partly reddish-brown. Along lateral margin of elytra runs one row of punctures only. General view as in plate LXV, phot. 580. Aedeagus as in figs 2595, 2596. Variation (very rare): elytra black (ab. *janaceki* REITTER, 1892). On *Salicaceae*, particularly

- on *Populus alba* L. and *P. tremula* L. Transpalaeartic species, distributed from Ireland to Japan and in Pakistan ..... **populi** LINNAEUS, 1758.
- . Body smaller, 7.0–10.0 mm long. Elytra red, their apex not blackened, remaining part of body black with bluish opr greenish metallic reflex. Along lateral margin of elytra run two rows of punctures ..... **2.**



Figs 2595–2600. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1994): 2595, 2596 – *Chrysomela (Chrysomela) populi*; 2597, 2598 – *C. (C.) tremula*; 2599, 2600 – *C. (C.) saliceti*.

2. Claw tarsomere on his underside forms two apical teeth. Pronotum usually longer. Aedeagus as in figs **2597**, **2598**. Length 7.5–10.0 mm (= *tremulae* PAYKULL, 1799, *longicollis* SUFFRIAN, 1851). On *Salicaceae*, particularly on *Populus alba* L. and *P. tremula* L. Transpalaeartic species, distributed from Ireland to Sakhalin and Kamchatka ..... **tremula** FABRICIUS, 1787.
- . Claw tarsomere without teeth. Pronotum usually shorter. Aedeagus as in figs **2599**, **2600**. Length 6.8–9.0 mm. Variations (very rare): elytra black (ab. *nigripennis* REITTER, 1894). On *Salicaceae*, particularly on *Salix purpurea* L. and *S. viminalis* L. Videdly distributed from France to Mongolia ..... **saliceti** SUFFRIAN, 1849.

### Subgenus *Pachylina* MEDVEDEV, 1969

#### Key to species

1. Pronotum entirely black. Body black. Trochanteres, femora (except their apices), middle part of tibiae, sides of two last abdominal sternites and often fore coxae yellowish orange. In dark coloured specimens yellowish orange are antennomeres 2–5 only. General view as in plate LXV, **phot. 581**. Aedeagus not studied. Length 5.4–6.2 mm (males) to 6.3–7.2 mm (females). Described from N Siberia (peninsula Taimyr), often considered as a subspecies of Canadian species *C. blaisdelli* VAN DYKE, 1938 ..... **taimyrensis** MEDVEDEV, 1969.
- . Sides of pronotum pale ..... **2.**

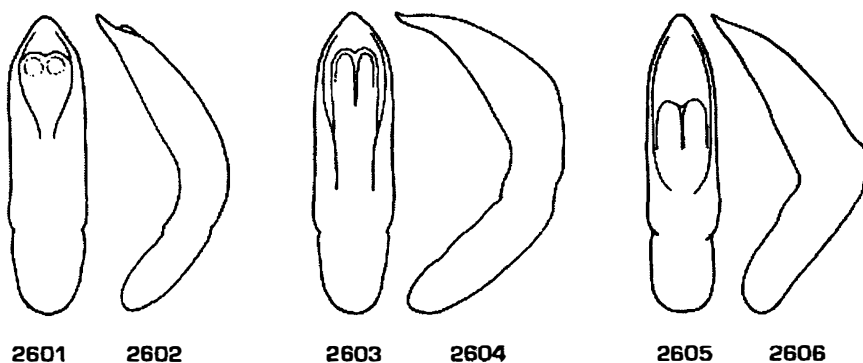
2. Smaller. Third antennomere  $1.5 \times$  longer than the fourth. Elytra moderately strongly punctured. Upper side black with metallic reflex (usually bronzy or violaceous, sometimes bluish or greenish). Sides of pronotum broadly yellow, usually with a little black spot in the middle. Legs always yellow with dark knees and tarsi. Length 4.2–5.5 mm. Subpolar species, distributed in northern part of Sweden and Finland ..... ***alpina*** ZETTERSTEDT, 1840.
- . Larger. Third antennomere more than  $2 \times$  longer than the fourth. Elytra strongly punctured. Upper side and legs coloured as in previous species, but legs often darker, sometimes entirely black. General view as in plate LXV, **phot. 582**. Aedeagus as in figs **2601**, **2602**. Length 5.6–7.6 mm (= *escheri* HEER, 1836). Variations: prosternum and legs entirely black (typical form), metallic reflex on elytra bronzy-greenish, sometimes very feeble (ab. *aurica* MOTSCHULSKY, 1860), sides of pronotum without black spot in the middle (unnamed), prosternum reddish, legs reddish with black knees and tarsi (ab. *geniculata* DUFTSCHMID, 1825), as in *geniculata*, but elytra with distinct bluish or bluish-green metallic sheen (ab. *salicis* FABRICIUS, 1792), on pronotum yellow colour enlarged, black pattern reduced to semilunar spot before scutellum (ab. *thoracica* WEISE, 1884). Lives on different species of *Salix*. Widely distributed from eastern France to northeastern Asia ..... ***collaris*** LINNAEUS 1758.

Subgenus ***Strickerus*** LUCAS, 1920

*Microdera* STEPHENS, 1839

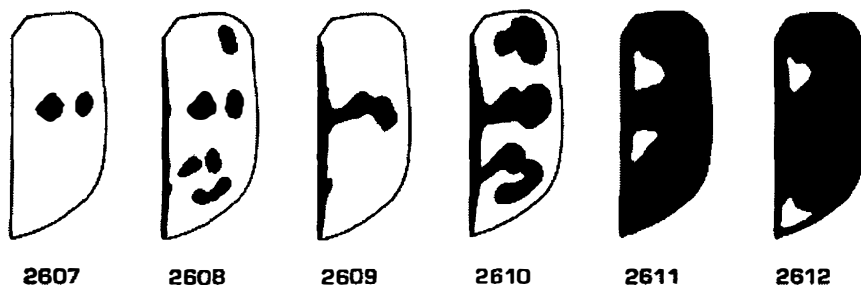
Key to species

1. Upper side entirely unicolorous, black with metallic sheen or reflex ..... **2.**  
 –. At least elytra bicolorous ..... **3.**



Figs 2601-2606. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1994): 2601, 2602 – *Chrysomela* (*Chrysomela*) *collaris*; 2603, 2604 – *C. (C.) cuprea*; 2605, 2606 – *C. (C.) lapponica*.

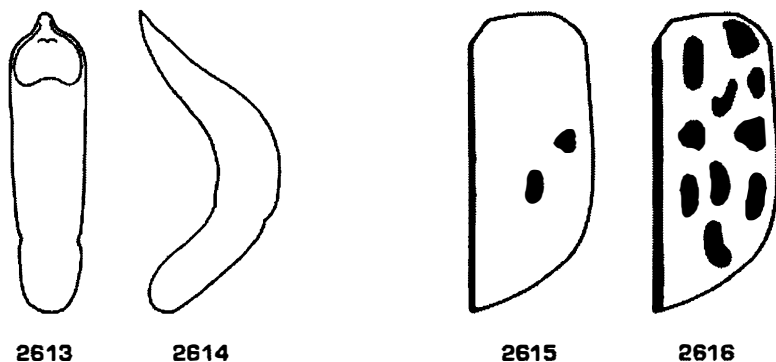
2. Pronotum with fine but distinct median longitudinal furrow. Upper side black, metallic reflex cupreous or violaceous. General view as in plate LXV, **phot. 583**. Aedeagus as in figs **2603, 2604**. Length 7.4–10.2 mm (= *ruficaudis* DEGEER, 1775). Variations: metallic reflex of upper side cupreous-violaceous (typical form), metallic reflex bronzy or cupreous (ab. *cuprobunnea* CSIKI, 1953), metallic reflex stronger, greenish blue (ab. *coeruleovirens* GABRIEL, 1928), elytra brown with black-greenish sutural stripe (ab. *sarmatica* WEISE, 1887). Distributed from eastern France to north-eastern Asia ..... ***cuprea*** FABRICIUS, 1775.
- . Pronotum without median furrow. Metallic sheen of upper side usually blue, sometimes greenish. Colour aberration of *lapponica* (thesis 3).



Figs 2607-2612. *Chrysomela (Strickerus) lapponica*, variations (after WARCHAŁOWSKI 1994): 2607 – ab. *quadripunctata*; 2608 – ab. *multipunctata*; 2609 – ab. *cruciata*; 2610 – typical form; 2611 – ab. *quadrimaculata*; 2612 – *quadrinotata*.

3. Pronotum unicolorous, elytra bicolorous with characteristic pattern. Body bluish or greenish black, antennomeres 2–6 entirely or on ventral side only reddish. Reddish are sometimes also external side of tibiae. General view as in plate LXV, **phot. 584**. Aedeagus as in figs **2605, 2606**. Length 5.7–8.9 mm. About 15 colour variations are described. The most important aberrations: elytron dark yellowish or reddish with two black spots as in fig. **2607** (ab. *quadripunctata* LENERKEN, 1913), elytron with six black spots as in fig. **2608** (ab. *multipunctata* JACOBSON, 1901), black pattern cross-like, as in fig. **2609** (ab. *cruciata* JACOBSON, 1901), black pattern as in fig. **2610** (typical form), elytron bluish black with two reddish spots as in fig. **2611** (ab. *quadrimaculata* JACOBSON, 1902), elytron bluish black with two reddish spots as in fig. **2612** (ab. *quadrinotata* GRADL, 1881), upper side uniformly blackish or greenish black (ab. *bulgharensis* FABRICIUS, 1798). Distributed from eastern France to Japan ..... ***lapponica*** LINNAEUS, 1758.
- . Pronotum with pale lateral stripes, elytra straw-coloured with black sutural stripe, on each elytron 10 black spots. Middle part of tibiae and basal part of femora usually yellowish, in dark aberrations legs entirely blackish ..... **4**.
4. Lateral borders of pronotum strongly punctured. Elytral punctures partly arranged in longitudinal rows. General view as in plate LXV, **phot. 585**. Aedeagus as in figs **2613, 2614**. Length 6.5–8.5 mm. Variations: elytron pale with two black spots

- as in fig. 2615 (ab. *quadripunctata* SCHULZE, 1911), elytron with 10 black spots as in fig. 2616 (typical form), black spots partly fused (ab. *pustulata* WEISE, 1884), a melanotic form: elytron black with pale narrow borders and two spots (ab. *extrema* SCHULZE, 1911). Distributed from eastern France to Japan .....  
 ..... ***vigintipunctata*** (SCOPOLI, 1763).
- Lateral borders of pronotum finely punctured. Elytral punctures rather in confused rows. Remaining characters as in *vigintipunctata* (thesis 4). Length 6.5–8.5 mm (= *octodecimpunctata* JACOBY, 1888). Distributed in China and Korea .....  
 ..... ***salicivorax*** (FAIRMAIRE, 1888).



Figs 2613-2016. *Chrysomela (Strickerus) vigintipunctata* (after WARCHALOWSKI 1994): 2613, 2614 – aedeagus in dorsal and lateral view.

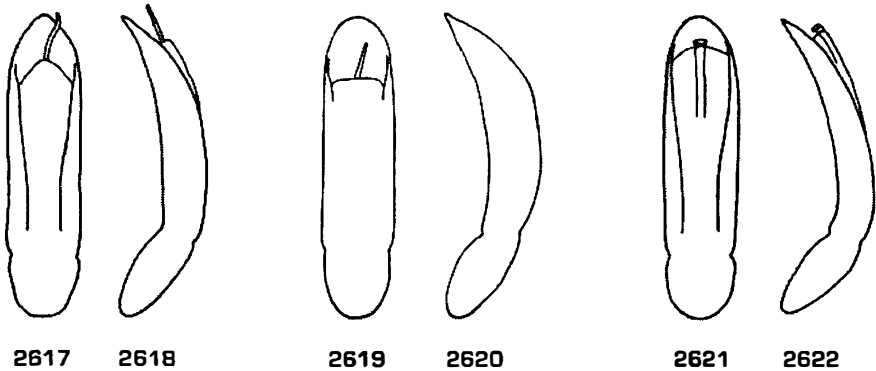
### Genus ***Colaphus*** DAHL, 1823

*Colaphus foveolatus* (GEBLER, 1848), an doubtful species (a dwarf form?) from European Russia not included in the key.

#### Key to species

1. Femora entirely reddish or only basally blackened. Upper side usually dark blue, sometimes black-green or dark violaceous, apex of elytra reddish. Length 4.2–6.0 mm. Aedeagus as in figs 2617, 2618. Distributed in southern Russia, Caucasian countries and in Central Asia. Often considered as a eastern subspecies of *sophiae* (thesis 5) ..... ***hoefti*** (MÉNÉTRIÉS, 1832).
- Femora entirely black or pitchy-brown ..... **2.**
2. E Palearctic species. Upper side dark blue, often black with violaceous or greenish reflex. Antennae and legs black. Length 4.0–6.0 mm (= *alpicola* WARCHALOWSKI, 2004). Forms two subspecies: ground of pronotum between punctures reticulated, somewhat matt (nominotypical subspecies from Altai, Sajan mountains, Baikal and Mongolia), ground of pronotum between punctures smooth and shining (subsp. *bowringii* BALY, 1865 = *grouvellei* ACHARD, 1926, distributed in China and

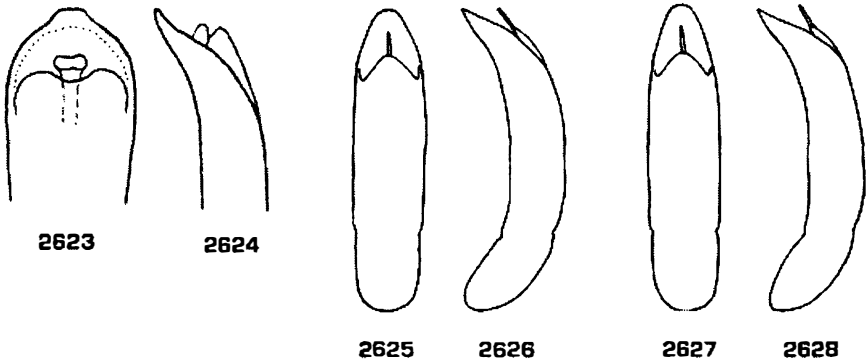
- N Indochina, here belongs probably also *nitidicollis* WEISE, 1889 from NW China and *jacutus* MACHATSCHKE, 1954 from E Siberia) ..... **alpinus** GEBLER, 1833.
- W Palearctic species ..... 3.
  - 3. Species NW Africa ..... 4.
  - Species from Europe, Asia Minor and Near East ..... 6.
  - 4. Length of body 5.0–6.5 mm. Tibiae basally darkened. Upper side dark blue, sometimes bicolorous (pronotum violaceous, elytra blue or head dark green, pronotum and elytra blue), densely and strongly punctate. Aedeagus as in figs **2619**, **2620**. Distributed in Morocco, Algeria and ?Egypt ..... **pulchellus** (LUCAS, 1849).
  - Length of body 3.5–4.5 mm. Tibiae entirely reddish. Upper side usually bronzy-black or black with bronzy-greenish sheen ..... 5.



Figs 2617–2622. Aedeagus in dorsal and lateral view (2619, 2620 after WARCHAŁOWSKI 2003, remaining after WARCHAŁOWSKI 1994): 2617, 2618 – *Colaphus hoefti*; 2619, 2620 – *C. pulchellus*; 2621, 2622 – *C. sophiae* s. str.

- 5. In male hind tibia thickened, pronotum much more shining than elytra. Distributed in Morocco ..... **tenuipes** WEISE, 1883.
- In male hind tibia not thickened, upper side uniformly shining. General view as in plate LXVI, **phot. 586**. Distributed in Algeria ..... **joliveti** BECHYNÉ, 1955.
- 6. Tibiae basally black. Length 4.2–6.1 mm (= *erythropus* GMELIN, 1790). General view as in plate LXVI, **phot. 587**. Variation: pronotum violaceous or violaceous-purplish, elytra greenish-blue (ab. *bicolor* REINECK, 1921). Occurs as following subspecies: aedeagus as in figs **2621**, **2622**, flagellum short (nominotypical subspecies from Central Europe), apex of aedeagus broadly rounded, flagellum longer, labrum sometimes darkened (subsp. *transsylvanicus* MACHATSCHKE, 1954 from Balkans), flagellum short, labrum always red (subsp. *amasiae* MACHATSCHKE, 1954 from Asia Minor). Distributed in Central and east-southern Europa (see also *hoefti*, thesis 1) ..... **sophiae** (SCHALLER, 1783).
- Tibiae entirely reddish ..... 7.

- 7. Body in lateral view strongly convex ..... **8.**
- Body in lateral view rather flattened. Upper side bronzy-green, covered by very dense and strong punctures. Length 5.0 mm. Described from Iran, based on one specimen only (sex not determined) ..... **zarudnyi** MEDVEDEV, 1973.
- 8. On average larger (length 4.8–5.7 mm). Punctures on pronotum distinctly finer than on elytra. Upper side usually dark blue. Aedeagus as in figs **2625, 2626**. Distributed in Israel and Lebanon ..... **palaestinus** ACHARD, 1923.
- On average smaller (length 4.5–5.0 mm). Pronotum approximately as strongly-punctured as elytra. Upper side usually dark bronzy, rarely bluish-violaceous. Aedeagus as in figs **2627, 2628**. Distributed in Asia Minor, Near East and Iran ...  
..... **apicalis** (MÉNÉTRIÉS, 1832).



Figs 2623-2628. Aedeagus in dorsal and lateral view (2623, 2624 after MACHATSCHKE 1954, remaining after WARCHALOWSKI 2003): 2623, 2624 – *Colaphus sophiae amasiae*; 2625, 2626 – *C. palaestinus*; 2627, 2628 – *C. apicalis*.

Genus **Colaspidema** LAPORTE, 1833

Genus *Colaspidema* LAPORTE includes 4 westmediterranean species.

Key to subgenera

- 1. Clypeus separated from frons by distinct line, upper side in mature specimens uniformly black, body length under 5.0 mm ..... **Colaspidema** s. str. (p. 525).
- Clypeus not separated from frons, upper side partly red, body length over 5.5 mm ...  
..... **Colaspomega** (p. 526).

Subgenus **Colaspidema** s. str.

One species only. Body normally entirely black except basal 6-7 antennomeres and sometimes tarsi, which are reddish. General view as in plate LXVI, **phot. 588**. Length

4.1–5.0 mm. Variations (immature specimens): sides and apex of elytra reddish (ab. *barbarum* FABRICIUS, 1792), pronotum also partly reddish (ab. *maculicollis* LEFÈVRE, 1873). Distributed in France, Iberian Peninsula, Morocco and Algeria ..... **atrum** (OLIVIER, 1799).

Subgenus *Colaspomega* REITTER, 1912

Key to species

1. Head entirely orange yellow. Legs orange yellow, tarsi and basal part of tibiae blackened. General view as in plate LXVI, **phot. 589**. Length 5.5–8.0 mm. Distributed in Algeria ..... **rufifrons** (OLIVIER, 1807).
- . Head entirely black ..... **2**.
2. Legs and elytral suture black. Length 7.5–8.5 mm. General view as in plate LXVI, **phot. 590**. Variations: on each elytron suture and two spots black (typical form), black spots on elytra fused into one great central spot (ab. *plagiatum* WEISE, 1882), elytra yellowish with black suture and undefined, blurred darker spots (unnamed). Distributed in northwest Africa ..... **signatipenne** GUÉRIN, 1844.
- . Legs orange yellow, tarsi and basal part of tibiae blackened, elytral suture yellow. General view as in plate LXVI, **phot. 591**. Length 7.0–8.0 mm. Distributed in Spain ..... **dufourii** (PEREZ 1865).

Genus *Crosita* MOTSCHULSKY, 1860

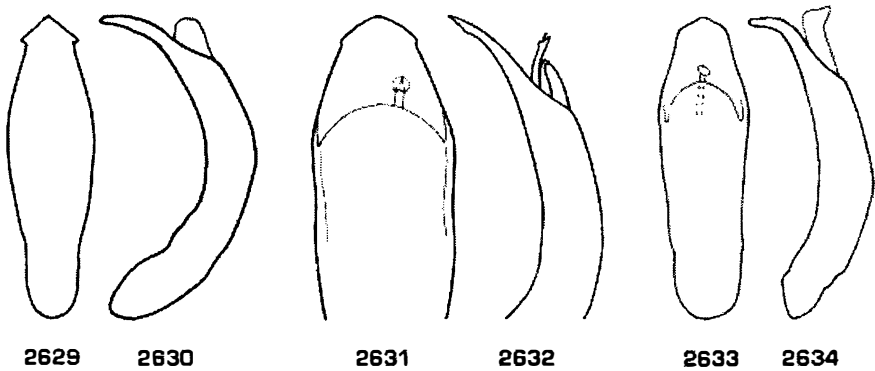
Genus *Crosita* MORSCH. contains 10 species, distributed in Central Asia from W Kazakhstan and Afghanistan to Mongolia, Transbaicalia and N China.

Key to species

1. Elytra entirely, distinctly longitudinally sulcate ..... **2**.
- . Elytra not sulcate ..... **5**.
2. Intervals on elytra alternately broader and narrower. In male hind tarsus glabrous along the middle. Length 8.0–11.0 mm. Forms two subspecies: three or four intervals strongly costiform elevate (subsp. *atasica* MEDVEDEV, 1976), on elytra no strongly elevate intervals (nominotypical subspecies). General view as in plate LXVI, **phot. 592**. Distributed in S Mongolia and NW China (nominotypical subspecies) and in Mongolian Altai (ssp. *atasica*) ..... **clementzae** JACOBSON, 1899.
- . Intervals on elytra of equal breadth ..... **3**.
3. On elytra intervals rather smooth, linear ..... **4**.
- . On elytra intervals punctured, partly confused. Upper side unicolorous, almost always black or blue-black. General view as in plate LXVI, **phot. 593**. Length 8.0–12.0 mm (= *potanini* JACOBSON, 1899). Variation: upper side green (ab. *viridula* JACOBSON, 1898). Endemic to Mongolia, distributed mainly in north part of the country ..... **kowalewskyi** subsp. **matronula** WEISE, 1894.
4. Costae on elytra well-developed, entire. Upper side purplish-cupreous. Distributed in Gobi-Altai mountains ..... **kowalewskyi** subsp. **gobica** LOPATIN, 1968.



- Costae on elytra somewhat indistinct. Elytra usually dark blue with partly greenish sulci, pronotum usually with more vivid green metallic sheen, rarely with purplish or dark blue tinge. Length 7.0–11.0 mm (males) to 8.3–12.5 mm (females) (= *kowalewskyi* ssp. *gobica* LOPATIN, 1968). Variations: upper side uniformly dark bluish-violaceous (ab. *unicolor* LOPATIN, 1968), body cupreous, elytra greenish-aeneous, their convexities darkened (ab. *cupreoviridula* JACOBSON, 1898), pronotum violaceous, elytra green (ab. *transitoria* LOPATIN, 1968), pronotum green, elytra bluish-violaceous (ab. *cyaneoviridula* LOPATIN, 1968). Distributed in Altai, S Mongolia and NW China ..... ***kowalewskyi*** (GEBLER, 1836) s. str.
- 5. In male first tarsomere of hind tarsi on underside entirely covered by short setae, at most with very narrow median line bare ..... **6.**
- In male first tarsomere of hind tarsi on underside with broad longitudinal glabrous area ..... **7.**
- 6. On average larger. Antennae and legs black with blue metallic reflex. Aedeagus as in figs **2629, 2630**. Length 8.8–11.5 mm. Distributed in Altai, Tuva and Mongolia ...  
..... ***longipes*** JACOBSON, 1898.
- On average smaller. Antennae and legs rusty-grey, without metallic reflex. Body black with greenish or violaceous reflex. Aedeagus as in figs **2631, 2632**. Length 8.0–9.5 mm. Described from W Mongolia ..... ***elegans*** LOPATIN, 1968.
- 7. Apex of aedeagus with two distinct teeth ..... **8.**
- Teeth at apex of aedeagus absent or very small and indistinct ..... **10.**



Figs 2629–2634. Aedeagus in dorsal and lateral view (2631, 2632 after LOPATIN 1968, remaining after LOPATIN 1970): 2629, 2630 – *Crosita longipes*; 2631, 2632 – *C. elegans*; 2633, 2634 – *C. kaszabi*.

- 8. Puncturation of elytra fine or at most moderately strong, upper side uniformly green or green with bluish hue. General view as in plate LXVI, **phot. 594**. Length 7.6–8.4 mm (male) to 8.7–10.5 mm (female). Described from NW China .....  
..... ***urumchiana*** CHEN, 1936.
- Puncturation of elytra much or at least distinctly stronger than on pronotum, upper side never uniformly green ..... **9.**

9. Body entirely black except antennomeres 2–3 and tarsal claws. Teeth at apex of aedeagus obtuse or rounded. Aedeagus not studied. Length 11.0–11.6 mm. Described from W Kazakhstan ..... *bogutensis* LOPATIN, 1996.
- . Body never entirely black, usually bi- or multicoloured. Teeth at apex of aedeagus sharp. Forms three subspecies, differing by colouration and sculpture: colouration vivid, upper side green, often with cupreous or golden area, sometimes almost entirely golden-cupreous, margins of pronotum and elytra bluish, puncturation of elytra strong (nominotypical subspecies, general view as in plate LXVII, **phot. 595**); upper side dark blue or blue-violaceous, puncturation of elytra very strong, often partly fused (subsp. *heptapotamica* JACOBSON, 1895 from Kazakhstan); disc of elytron dark, blackish-violaceous or blackish-purplish with cupreous borders and narrow green margins, sculpture of elytra relatively fine (subsp. *maximovitschii* ZOUBKOFF, 1833); upper side purplish or red-cupreous, margins green, puncturation of elytra strong or very strong, almost without rugosities (subsp. *faldermanni* KRYNICKI, 1832). Distributed in Kazakhstan, Altai, NW China and Mongolia ..... *altaica* (GEBLER, 1823).
10. Lateral furrow of pronotum short and shallow, in anterior half replaced by a stripe of strong punctures. Upper side rather feebly shining, finely punctured, body dark blue or black with violaceous reflex, outline relatively slender. General view as in plate LXVII, **phot. 596**. Length 7.5–11.5 mm. Described from Afghanistan ..... *afghanica* LOPATIN, 1962.
- . Lateral furrow of pronotum deep and well-developed at least in basal half ..... **11**.
11. On average smaller and more stout. Body uniformly coloured, black with violaceous reflex, dark green or dark blue. General view as in plate LXVII, **phot. 597**. Length 5.4–10.0 mm. Distributed in Tuva and NW Mongolia ..... *pigra* WEISE, 1894.
- . On average larger, body less stout. Upper side uniformly dark blue, black-blue or black-violaceous, feebly shining, densely and strongly punctured, punctures on elytra double. Aedeagus as in figs **2633**, **2634**. Length 7.5–11.5 mm. Endemic to Mongolia ..... *kaszabi* LOPATIN, 1970.

Genus *Cyrtonastes* FAIRMAIRE, 1874

Literature: BERTI and DACCORDI 1974.

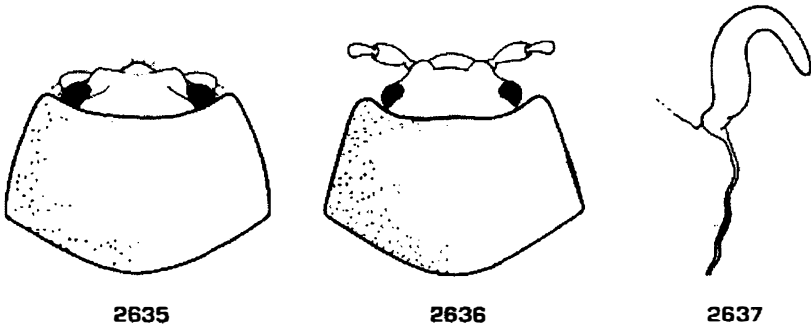
Key to subgenera

1. Elytral punctures fine, usually geminate. Tubular part of aedeagus longer and narrower. Proximal part of vasculum spermathecae short. Species from Near East ..... *Cyrtonastes* s. str. (p. 529).
- . Elytral punctures moderately strong, never geminate. Tubular part of aedeagus shorter and thicker. Proximal part of vasculum spermathecae short elongate. Species from eastern part of Mediterranean area ..... *Natocyrstes* (p. 531).

Subgenus *Cyrtonastes* s. str.

Key to species

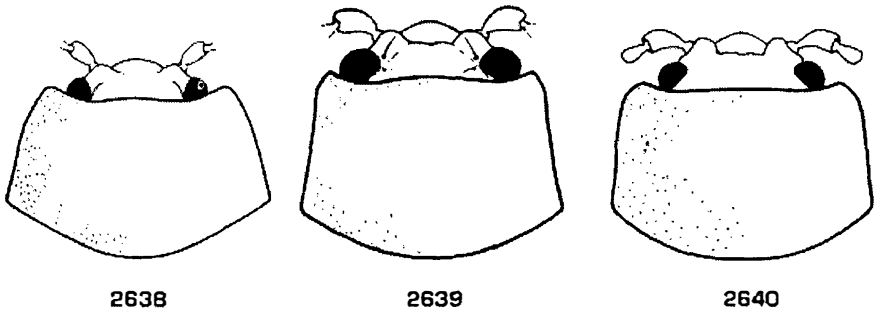
1. Body short oval, strongly convex. Pronotum trapezoidal (fig. 2635). Elytral punctures distinctly geminate ..... 2.
- Body elongate. Pronotum transverse (fig. 2640). Elytral punctures geminate, sometimes confuse or reticuliform ..... 4.
2. Lateral sides of pronotum on whole length straight (fig. 2636) or on anterior third convergent (fig. 2638) ..... 3.
- Lateral sides of pronotum slightly rounded (fig. 2635). Pronotum almost smooth, laterally and basally with sparse punctures. Elytral punctures geminate, distinct. Length 3.8 mm. One specimen (male) from Syria known only ..... *aeneomicans* FAIRMAIRE, 1874.



Figs 2635-2637. Pronotum, spermatheca (after BERTI and DACCORDI 1974): 2635 - *Cyrtonastes (Cyrtonastes) aeneomicans*; 2636 - *C. (C.) ovatus*; 2637 - *C. (C.) libanensis*.

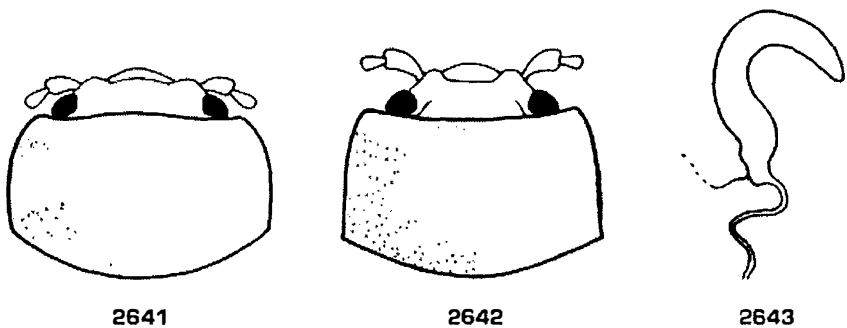
3. Lateral sides of pronotum on whole length straight (fig. 2636). Surface of pronotum densely punctate. Elytral punctures geminate, very distinct, intervals covered by fine secondary punctures. Length 4.0 mm. One specimen (male) from Syria known only ..... *ovatus* BERTI et DACCORDI, 1974.
- Lateral sides of pronotum straight, in anterior third stronger convergent (fig. 2638). Surface of pronotum less densely punctate. Elytral punctures very regularly geminate, shallow, secondary punctures of intervals hardly visible. Spermatheca as in fig 2637. Length 4.30 mm (male) and 4.55 mm (female). Described based on one pair from Lebanon only ..... *libanensis* BERTI et DACCORDI, 1974.
4. Pronotum moderately transverse (figs 2639, 2640) ..... 5.
- Pronotum transverse (figs 2644-2642) ..... 6.
5. Lateral sides of pronotum straight, anterior angles strongly rounded (fig. 2640). Punctures of pronotum fine, homogenous. Elytral punctures very distinct, rather regularly geminate. Length 4.3 mm. Described based on one specimen from Israel (male) only ..... *phaedonoides* FAIRMAIRE, 1874.

- Lateral sides of pronotum (fig. 2639) oblique, slightly sinuate, anterior angles obtuse. Punctures of pronotum very sparse, denser near anterior angles. Elytral punctures shallow, rows equidistant, here and there doubled. Length 3.85 mm. Described based on one specimen from Syria (male) only ..... *henoni* BERTI et DACCORDI, 1974.



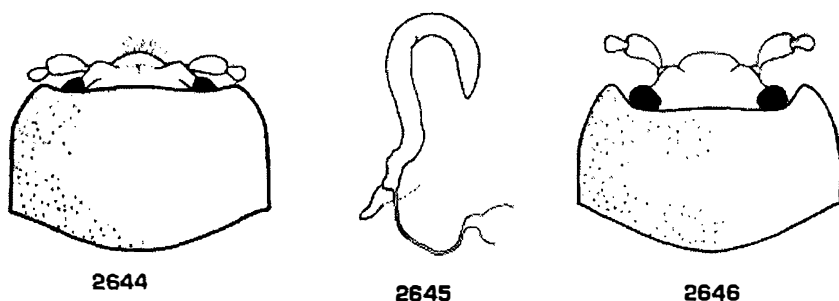
Figs 2638-2640. Pronotum (after BERTI and DACCORDI 1974): 1838 - *Cyrtonastes (Cyrtonastes) libanensis*; 1839 - *C. (C.) phaedonooides*; 1840 - *C. (C.) henoni*.

- 6. Lateral sides of pronotum straight ..... 7.
- Lateral sides of pronotum rounded. (fig. 2641). Pronotum very finely punctured, almost smooth, near anterior angles several strong punctures. Elytral punctures regular, uniserial, rather shallow. Intervals broad, more or less distinctly reticulate. Length 3.7 mm. Described based on one specimen (male) from Syria only ..... *balachowskyi* BERTI et DACCORDI, 1974.



Figs 2641-2643. Pronotum, spermatheca (after BERTI and DACCORDI 1974): 2641 - *Cyrtonastes (Cyrtonastes) balachowskyi*; 2642 - *C. (C.) schereri*; 2643 - *C. (C.) confusus*.

7. Lateral sides of pronotum feebly convergent, anterior margin regularly rounded (fig. 2642). Punctures of pronotum sparse, in basal part a little denser. Elytral punctures distinct, moderately geminate. Intervals narrow. Length 3.5 mm. Described based on one specimen (male) from Israel only ..... *schereri* BERTI et DACCORDI, 1974.
- . Lateral sides of pronotum strongly convergent, anterior margin sinuate (fig. 2644). Punctures of pronotum dense, laterally and basally more distinct. Elytral punctures rather regularly geminate. General aspect of sculpture confuse. Spermatheca as in fig. 1819. Length 3.65 mm (male), 4.60 mm (female). Described based on three specimens from Syria ..... *confusus* BERTI et DACCORDI, 1974.



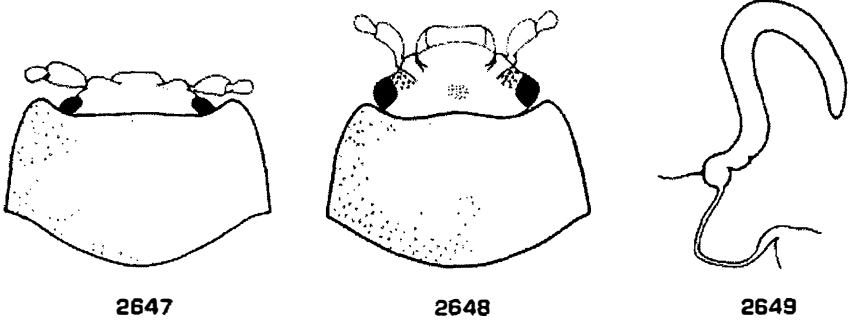
Figs 2644-2646. Pronotum, spermatheca (after BERTI and DACCORDI 1974): 2644 - *Cyrtanastes (Cyrtanastes) confusus*; 2645, 2646 - *C. (Natocyrstes) seriatoporus*.

### Subgenus *Natocyrstes* BERTI et DACCORDI, 1974

#### Key to species

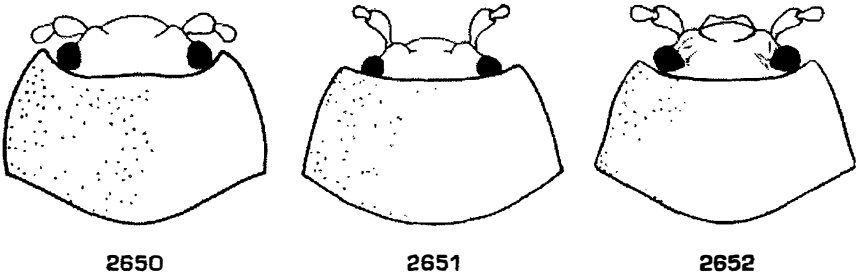
1. Pronotum transverse ..... **2.**  
 -. Pronotum trapezoidal ..... **3.**
2. Antennomeres subovate. Pronotum (fig. 2646) with projecting anterior angles, sparsely punctured. Elytral punctures distinct, irregularly uniserial. Spermatheca as in fig. 1820. Length 4.1-5.0 mm (= *cytherias* PIC, 1903). Distributed in southern Greece and in Crete ..... *seriatoporus* FAIRMAIRE, 1880.  
 -. Antennomeres subconical. Anterior angles of pronotum (fig. 2647) obtuse, punctures very sparse, on disc fine, stronger marked near angles. Elytral punctures shallower, regularly uniserial. Length 4.5 mm. Described based on one specimen (male) from Sparta only ..... *lacedaemonis* BERTI et DACCORDI, 1974.
3. Elytral punctures strong, secondary punctures of intervals homogenous or double. Anterior angles of pronotum feebly projecting ..... **4.**  
 -. Elytral punctures fine, uniserial, intervals broad. Anterior angles of pronotum (fig. 2648) form two projecting lobes. Length 4.1 mm. Described based on one specimen (male) from Peloponnes only ..... *peloponnesiacus* BERTI et DACCORDI, 1974.

- 4. Lateral sides of pronotum straight (figs **1833**, **1834**), surface very sparsely punctured ..... **5**.
- Lateral sides of pronotum regularly rounded (fig. **2650**), surface densely punctured. Spermatheca as in fig. **1821**. Length 4.1-5.1 mm. Known from Corfu only ..... **weisei** REITTER, 1884.



Figs 2647-2649. Pronotum, spermatheca (after BERTI and DACCORDI 1974): 2647 - *Cyrtanastes (Natocyrstes) lacedaemonis*; 2648 - *C. (N.) peloponnesiacus*; 2649 - *C. (N.) weisei*.

- 5. Secondary punctures of elytral intervals homogenous. Lateral sides of pronotum straight, on anterior third convergent (fig. **2651**). Length 4.3-5.6 mm. Known from Albania only. Perhaps conspecific with *weisei* (antithesis 4) ..... **ruffoi** BERTI et DACCORDI, 1974.
- Secondary punctures of elytral intervals double. Lateral sides of pronotum oblique, slightly sinuate (fig. **2652**). Length 4.7-5.5 mm. Known from isle Zante only ..... **zacynthi** BERTI et DACCORDI, 1974.

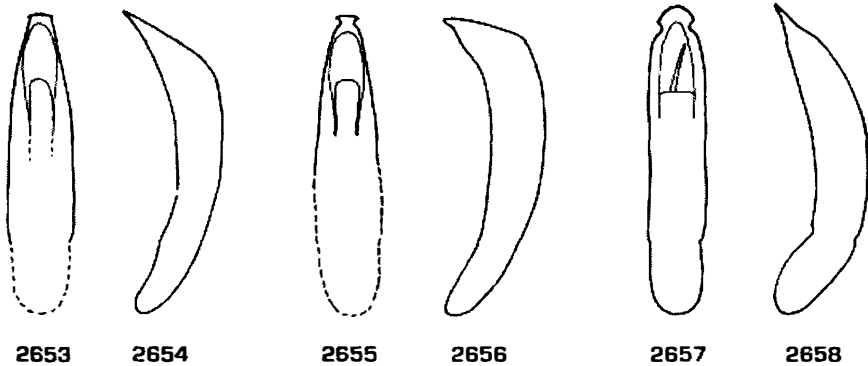


Figs 2650-2652. Pronotum (after BERTI and DACCORDI 1974): 2650 - *Cyrtanastes (Natocyrstes) weisei*; 2651 - *C. (N.) ruffoi*; 2652 - *C. (N.) zacynthi*.

The genus *Cyrtonus* has never been revised, hence only scattered descriptions of single species exist. Almost all the descriptions come from the 19<sup>th</sup> C. and are based on external, unstable and often poorly distinct characters; in consequence the taxonomic status of some formally described (nominal) species is extremely doubtful. Only 25 nominal species known to the author are included in the key below; the remaining 10 species require examination of the type material.

## Key to species

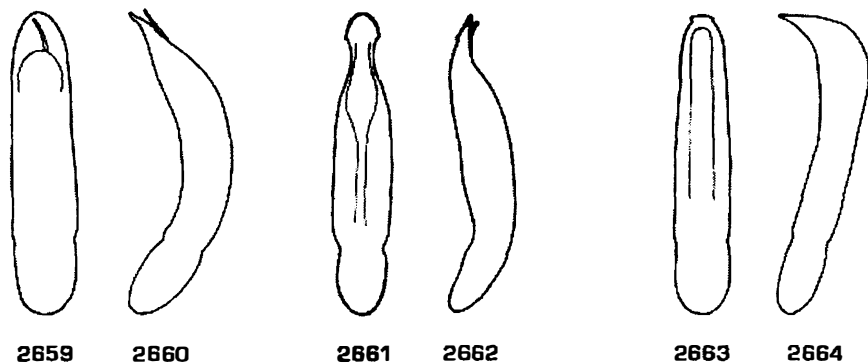
1. N African species ..... 2.
- European species ..... 3.
2. Upper side black with aeneous reflex. Pronotum very convex. On elytra intervals feebly but perceptibly convex. Aedeagus as in figs 2653, 2654. Length about 6.5 mm. Two subspecies from northern Morocco are described: subsp. *ouezzani* (KOCHER, 1958) from Ouezzan area and *antoinei* (KOCHER, 1958) from the region between Fes and Kenitra. Known from Morocco only ..... *gibbicollis* (FAIRMAIRE, 1866).
- Externally similar to *gibbicollis* (thesis 2), but a little smaller and aedeagus (figs 2655, 2656) differently formed. Length about 6.0 mm. Described as a subspecies of *gibbicollis* from N Morocco, but surely a distinct species ... *riffensis* (COBOS, 1954).



Figs 2653-2658. Aedeagus in dorsal and lateral view (2657, 2658 after WARCHALOWSKI 2003, remaining after COBOS 1954): 2653, 2654 – *Cyrtonus gibbicollis*; 2655, 2656 – *C. riffensis*; 2657, 2658 – *C. majoricensis*.

3. Species from Mallorca. Aedeagus as in figs 2657, 2658. Length 5.0–6.5 mm. Endemic to Balears ..... *majoricensis* (BREIT, 1908).
- Species from Iberian Peninsula and S France ..... 4.

4. Body large, 7.0–8.5 (on average about 7.5) mm long. On elytra primary punctures distinct, arranged in regular or almost regular, simple rows ..... 5.
- . Body smaller, almost always under 7.0 mm. On elytra rows of primary punctures often double, sometimes puncturation entirely or almost entirely randomly scattered ..... 6.
5. Upper side black with very feeble graphite or leady reflex. On elytra primary punctures very fine and shallow. Aedeagus (figs **2659**, **2660**) neither suddenly narrowed nor incised before apex. Length 7.0–8.5 mm (= *C. plumbea* FAIRMAIRE, 1883). In opinion of COBOS (1954) here probably also (FAIRMAIRE, 1882) described from Andalusia, *C. major* (FAIRMAIRE, 1883) based on one specimen only and *C. pazii* (FAIRMAIRE, 1883) also described based on one female only (both last species from Alicante) and perhaps *sycophanta* (FAIRMAIRE, 1883) described also from Alicante, whereas *C. gadorensis* COBOS, 1954 from Central Spain (aedeagus figs **1635**, **1636**, described as a subspecies of *plumbea*, should to be considered as a distinct species. Distributed in south-western Spain from Ronda to Alicante ..... *fairmairei* (ROSENHAUER, 1856).
- . Upper side strongly shining, with metallic gloss, usually bicolorous, normally dark green, on elytra alternate intervals with purplish reflex. General view as in plate LXVII, **phot. 598**. Aedeagus as in figs **2661**, **2662**. Variation: upper side uniformly dark cupreous (ab. *coruscans* VUILLEFROY, 1868). Length 7.0–8.5 mm. Distributed in Portugal (Algarve, Serra da Estrela) ..... *elegans* (GERMAR, 1813).



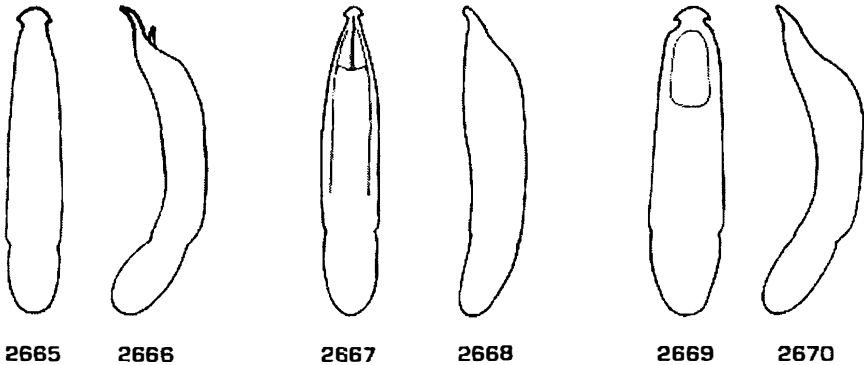
Figs 2659–2664. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 2003): 2659, 2660 – *Cyrtonus fairmairei*; 2661, 2662 – *C. elegans*; 2663, 2664 – *C. oomorphus*.

6. Puncturation on central part of pronotum relatively strong and dense, interstices usually on average 2.0–2.5 × broader than diameter of punctures ..... 7.
- . Puncturation on central part of pronotum very fine and shallow, sometimes almost disappearing ..... 9.
7. Apical part of aedeagus (figs **2663**, **2664**) strongly bent ventrally, its apex, limited by both lateral incisions, broad and very short. Pronotum longer, its lateral sides almost



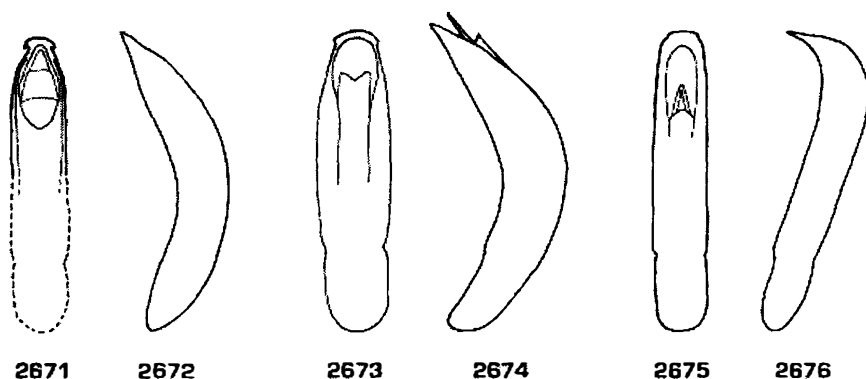
straight, in hind part slightly laterally impressed. Upper side dark aeneous, aeneous-green or almost pure green, metallic sheen usually strong, sometimes very strong. Primary puncturation of elytra strong and deep, arranged in distinct, simple rows. Secondary punctures fine but deep and distinct. Legs and antennae brown. Tarsi and a few basal antennomeres brownish yellow, antennomeres 7 and 8 as broad as long. Length 5.0–5.3 mm (male) to 5.5–5.8 mm (female). Distributed in Asturia and in W Pyrenees ..... *oomorphus* (FAIRMAIRE, 1882).

- Apex of aedeagus limited by both lateral incisions narrower and longer ..... **8**.
- 8. Pronotum shorter, its lateral sides rounded. General view as in plate LXVII, **phot. 599**. Antennae pitchy brown, first and second antennomeres dark red, antennomeres 6–9 distinctly broader than long. Upper side usually blue-black, sometimes almost pure black, rarely black with greenish reflex. Primary punctures on elytra arranged in simple rows, not always distinct and not always distinguishable from the secondary puncturation. Apical part of aedeagus in lateral view vavy bent (figs **2665**, **2666**). Length 4.3–6.2 mm (usually: male about 4.8 mm and female about 5.5 mm). Distributed in mountains of Central Spain (Cordillera Central: Sierra de Gredos and Sierra de Guadarrama), reported also from Badajoz and Andalusia ....  
..... *montanus* (FAIRMAIRE, 1850).
- Pronotum longer, its lateral sides feebly rounded. Antennomeres 6–9 longer than broad. Upper side black with bronzy metallic reflex. Metapleurae strongly punctate. Aedeagus as in figs **2667**, **2668**. Distributed in eastern Spain (La Alcarria, Serrania de Cuenca, Sierra de Gudar) ..... *puncticeps* (FAIRMAIRE, 1882).
- 9. Puncturation of pronotum extremely fine, barely visible. Primary Puncturation of elytra strong, partly alineate, here and there blurred by almost equally strong Puncturation of intervals. Upper side black with very feeble bluish reflex, antennae entirely light rust yellow. Third antennomeron almost 2 × longer than the fourth. Aedeagus not studied. Length (female) about 6.0 mm. Distributed in E Pyrenees ....  
..... *punctipennis* (FAIRMAIRE, 1857).
- Puncturation of pronotum and elytra not conspicuously different ..... **10**.



Figs 2665-2670. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 2003): 2665, 2666 – *Cyrtonus montanus*; 2667, 2668 – *C. puncticeps*; 2669, 2670 – *C. rotundatus*.

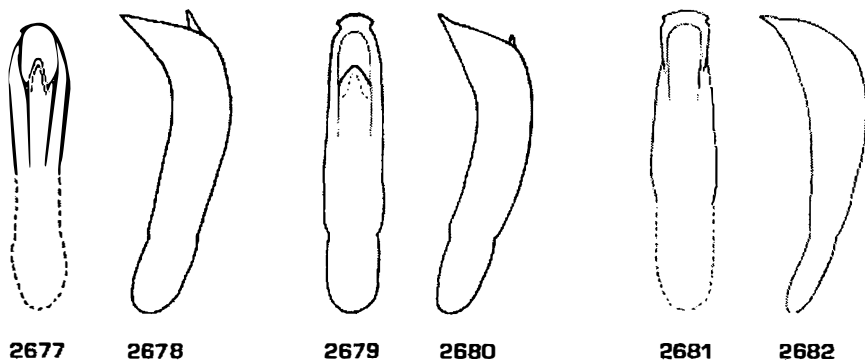
10. Outline of body very short and broad, elytra about 1.5 times longer than pronotum. Hind angles of pronotum surrounding the humeral calli ..... 11.  
 – Outline of body not very short and broad (see also *almeriensis*, thesis 24), elytra more than 1.5 times longer than pronotum ..... 12.
11. Aedeagus as in figs 2669, 2670. Smaller, length 5.0–6.0 mm. Distributed in S France and in Pyrenees. Perhaps conspecific with *C. denticulatus* (CHEVROLAT, 1872) described from northern part of Central Spain .....  
 ..... **rotundatus** (HERRICH-SCHÄFFER, 1838).  
 – Aedeagus as in figs 2671, 2672. Larger, length 6.0–7.5 mm. Described from SE Spain ..... **pardoi** (COBOS, 1953).
12. Apex of aedeagus limited by both lateral incisions, very short and broad, almost as broad as apical 1/4 of tubular part. Its anterior margin feebly arcuate or almost straight. Apical 1/3 or 1/4 of tubular part very distinctly or strongly bent ventrally ...  
 ..... 13.  
 – Apex of aedeagus limited by both lateral incisions, moderately broad or narrow, always narrower than apical 1/4 of tubular part. Its anterior margin distinctly arcuate ..... 18.
13. Incisions at apex of aedeagus (figs 2673, 2674) very long and shallow. Body relatively large, length in male over 6.0 mm, in female almost 8.0 mm. External characters as in *fairmairei* (thesis 5). Described from SE Spain (Sierra de Gador) as a subspecies of *plumbeus* ..... **gadorensis** (COBOS, 1954).  
 – Incisions at apex of aedeagus short and usually deep ..... 14.



Figs 2671-2676. Aedeagus in dorsal and lateral view (2671, 2672 after COBOS 1953; 2673, 2674 after COBOS 1954; 2675, 2676 after WARCHALOWSKI 2003): 2671, 2672 – *Cyrtonus pardoi*; 2673, 2674 – *C. gadorensis*; 2675, 2676 – *C. martorellii*.

14. Primary punctures of elytra arranged in longitudinal rows, rather strong ..... 15.  
 – Primary punctures of elytra arranged in longitudinal rows, fine or very fine .... 16.
15. Aedeagus as in fig. 2675, 2676. Antennae entirely light. Length 5.0–6.0 mm. Distributed in Central Spain ..... **martorellii** (FAIRMAIRE, 1880).

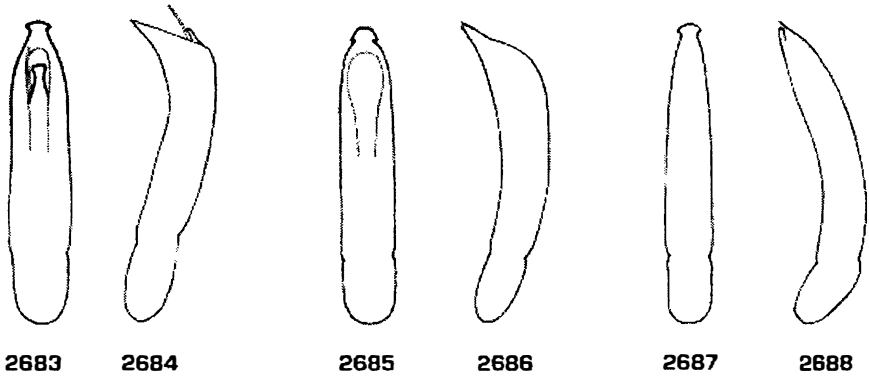
- Aedeagus as in figs **2663, 2664**. Metallic sheen of upper side usually strong. Length under 6.0 mm. Here some forms of oomorphus (thesis 7) with finely punctured pronotum.
- 16. Aedeagus (figs **2677, 2678**) with a long lateral furrow. Upper side black with feeble golden-greenish reflex. On elytra intervals entirely flat. Length 5.0–6.0 mm. Distributed in Sierra Nevada and in neighbouring area (Alpujarra, Granada, Almeria). Perhaps conspecific with *cylindrica* (MARSEUL, 1883) or/and *dorsolineata* (FAIRMAIRE, 1883) ..... **mateui** (COBOS, 1953).
- Aedeagus without lateral furrow ..... **17**.



Figs 2677-2682. Aedeagus in dorsal and lateral view (2677, 2678 after COBOS 1954, remaining after WARCHAŁOWSKI 2003): 2677, 2678 – *Cyrtonus mateui*; 2679, 2680 – *C. cuprevirens*; 2681, 2682 – *C. dufouri*.

- 17. Aedeagus as in figs **2679, 2680**. Upper side black with aeneous, cupreous or purplish reflex, shining. Lateral sides of pronotum in hind 2/3 almost parallel. Punctuation of elytra fine but distinct, primary punctures arranged in regular, longitudinal rows. Length 5.0–5.5 mm (male) to 5.5–6.4 mm (female). Described from Catalonia ..... **cuprevirens** (PEREZ, 1872).
- Aedeagus as in figs **2681, 2682**. Relatively small, rather elongate, shining. Upper side black with distinct metallic greenish, cupreous or purplish reflex. Primary punctures of elytra arranged in longitudinal rows, in male simple, in female a little confuse or doubly. Length 4.8–5.2 mm (male) to 5.0–5.5 mm (female) (= *coarctata* MULSANT, 1847). Distributed in southern France ..... **dufour** (DUFOUR, 1847).
- 18. Primary and secondary punctures of elytra equal strong, not alineate, but arranged in longitudinal stripes ..... **19**.
- Primary punctures of elytra distinctly sometimes very fine but always distinctly stronger than the secondary, usually arranged in longitudinal simple rows ..... **20**.
- 19. Upper side black with distinct aeneous or cupreous sheen, punctuation of pronotum and elytra rather fine, but deep and clear, ground strongly shining. In male first tarsomere of fore legs moderately broadened. Aedeagus dorsally without long and

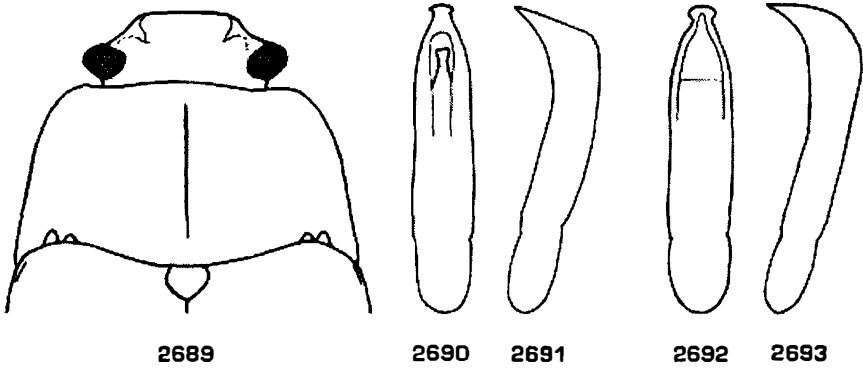
- broad gutter, (figs **2683**, **2684**) operculum narrowed before its apex. Length barely 5.0 mm. Described from Guarda (Portugal) ..... **punctulatus** (FAIRMAIRE, 1883).
- . Punctuation of upper side similar as in *punctulatus* (thesis 21), but interstices rather feebly shining. Upper side variously coloured, black with aeneous reflex sometimes with greenish or purplish sheen. In male first tarsomere of fore legs strongly broadened, roundish. Aedeagus (figs **2685**, **2686**) dorsally with long and broad gutter, operculum not narrowed before its apex. Length about 6.0 mm. Described from Portugal ..... **versicolor** (MARSEUL, 1883).



Figs 2683-2388. Aedeagus in dorsal and lateral view (2687, 2688 after COBOS 1954, remaining after WARCHAŁOWSKI 2003): 2683, 2684 – *Cyrtonus punctulatus*; 2685, 2686 – *C. versicolor*; 2687, 2688 – *C. arcasi*.

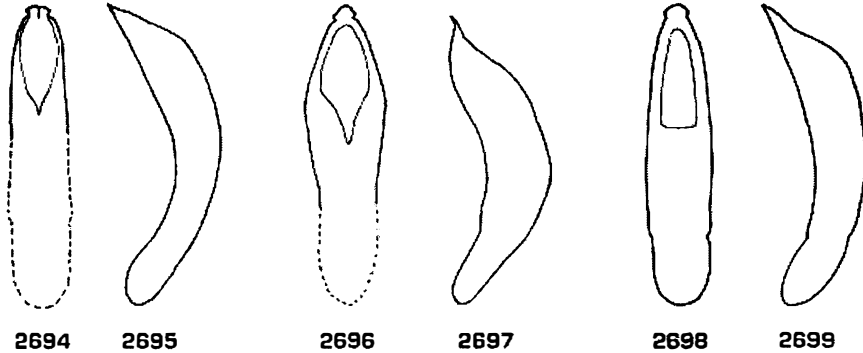
20. Tubular part of aedeagus gradually narrowed to apex, apical part limited by lateral incisions suddenly broader (figs **2687**, **2688**). Outline of head and pronotum as in fig. **2689**. Upper side black with aeneous reflex, externally similar to *dufouri* (antithesis 19), but on average larger. Length 5.5–6.5 mm. Distributed in SE Spain, known from Granada and La Sagra Mts ..... **arcasi** (FAIRMAIRE, 1884).
- . Aedeagus formed differently ..... **21**.
21. Apical 1/3 or 1/4 of tubular part of aedeagus strongly bent ventrally ..... **22**.
- . Apical 1/3 or 1/4 of tubular part of aedeagus not or indistinctly bent ventrally ... **23**.
22. Pronotum relatively long, distinctly narrower than elytra. Upper side black with feeble greenish or bluish reflex. Punctuation of upper side fine, on hind 1/3–1/2 of elytra entirely randomly scattered. Aedeagus formed almost identically as in *punctulata* (thesis) and also with operculum narrowed before its apex (figs **2690**, **2691**), without lateral furrow. Length 5.7–6.5 mm. Distributed in E Spain (Teruel, Murcia, E Andalusia) ..... **ruficornis** (FAIRMAIRE, 1850).
- . Pronotum shorter, not distinctly narrower than elytra. Upper side usually pure black or with feeble lead, only rarely with feeble aeneous reflex. On hind part of elytra at least traces of regular rows are perceptible. Aedeagus as in figs **2692**, **2693**, laterally with a short longitudinal furrow or impression. Length 5.5–6.5 mm. Distributed in Central Spain ..... **eumolpus** (FAIRMAIRE, 1850).

23. Apex of aedeagus (figs **2694**, **2695**) limited by both lateral incisions with longitudinal furrow, apparently bilobed. Body convex, short and broad. Length 6.0–6.5 mm. Described from eastern Andalusia (vicinity of Almeria) ..... *almeriensis* (COBOS, 1953).  
 -. Apex of aedeagus limited by both lateral incisions simple ..... **24**.



Figs 2689-2693 (2689 after COBOS 1954, remaining after WARCHALOWSKI 2003): 2689 – *Cyrtonus arcasi*, head and pronotum; 2690-2693 – aedeagus in dorsal and lateral view: 2690, 2691 – *C. ruficornis*; 2692, 2693 – *C. eumolpus*.

24. Eyes very strongly convex. Aedeagus as in figs **2696**, **2697**. Externally similar to *dufouri* (antithesis 19). Length about 5.0 mm. Described from NW Spain (prov. Pontevedra) ..... *franzi* (COBOS, 1954).  
 -. Eyes normal, not particularly strongly convex ..... **25**.



Figs 2694-2699. Aedeagus in dorsal and lateral view (2694, 2695 after COBOS 1953; 2696, 2697 after COBOS 1954; 2698, 2699 after WARCHALOWSKI 2003): 2694, 2695 – *Cyrtonus almeriensis*; 2696, 2697 – *C. franzi*; 2698, 2699 – *C. thoracicus*.

25. Short oval, upper side aeneous with feeble cupreous reflex, externally similar to *rotundata* (thesis 11). Head rather densely punctate, line over clypeus shallow, near eyes barely perceptible. Antennae dark reddish, their basis lighter. Sides of pronotum rather strongly rounded, near basis slightly sinuate, hind angles rounded, does not surround humeral calli. Surface of pronotum finely, but rather deep, densely and uniformly punctate. Ground of elytra shining, primary punctures sublineate, secondary puncturation relatively strong, as strong as puncturation of pronotum. Underside and legs pitchy with aeneous reflex, tarsi piceous, prosternum distinctly channeled. Aedeagus not studied. Length 5.4 mm (male) to 6.2 mm (female). Described from Catalonia ..... ***brevis*** (FAIRMAIRE, 1850).
- . Oval, convex, upper side very finely and scarcely punctate, on pronotum puncturation barely perceptible. Length 5.4–6.4 mm. Aedeagus as in figs **2698, 2699**. Distributed in Andalusia ..... ***thoracicus*** (FAIRMAIRE, 1850).

#### Remaining species

##### ***Cyrtonus angusticollis*** (FAIRMAIRE, 1850)

Oblong, greenish-aeneous, shining, antenna rusty reddish, their apices covered by grey pubescence. Anterior part of head strongly punctate, remaining part finely and loosely punctulate. Line over clypeus well-impressed. Pronotum perceptibly narrowed anteriorly, very finely punctulate. Elytra oval, in hind part slightly ampliate, primary punctures sublineate, secondary very fine. Underside shining. Tibiae apically and tarsi reddish; prosternum shallowly impressed. Aedeagus not studied. Length 7.0 mm. Described from Andalusia.

##### ***Cyrtonus canalisternus*** (MARSEUL, 1883)

Oval, rather convex, upper side dark bronzy, shining. Head fairly strongly punctate. Line over clypeus shallower in the middle, externally deepened, reaching to eyes. Elytra slightly convex, broadened posteriorly, in anterior part channeled, humeral calli absent. Puncturation arranged in rather regular rows. Prosternum channeled also at basis. Aedeagus not studied. Length 6.0 mm. Described from N Portugal (Bragança).

##### ***Cyrtonus curtus*** (FAIRMAIRE, 1883)

Oval, strongly convex, upper side cupreous, head and suture with greenish-aeneous reflex. From *thoracica* (antithesis 26) differs by form of body stronger convex and its colouration. Aedeagus not studied. Length 5.0–5.5 mm. Described from Asturia.

##### ***Cyrtonus curtulus*** (FAIRMAIRE, 1883)

Similar to *curtus*, but body more oblong. Puncturation finer and more distinct, prosternum without gutter, slightly impressed anteriorly. Aedeagus not studied. Length 5.0 mm. Locus typicus: Eborá. Described based on one specimen (sex not mentioned) only.

***Cyrtonus ehlersi*** (FAIRMAIRE, 1884)

In very curt original description compared with *contractus* (= ? *pardoi*), but smaller, hind angles of pronotum with strong points, parapleurae distinctly punctured. Aedeagus not studied. Length 5.5–6.5 mm. Described from S Spain (Sierra de Espuña).

***Cyrtonus gratiosus*** (ROSENHAUER, 1856)

Smaller than *fairmairei* and relatively less convex. Puncturation of elytra distinct, intervals perceptibly convex. Aedeagus not studied. Length 6.0 mm. Described from W Andalusia (Serrania de Ronda).

***Cyrtonus heydeni*** (FAIRMAIRE, 1884)

According to the curt original description generally similar to *dufouri*, but larger. Aedeagus not studied. Length 8.5 mm, described from Asturia (sex not mentioned), aedeagus not studied. The very large body size suggests a near affinity or conspecificity with *fairmairei*.

***Cyrtonus minor*** (FAIRMAIRE, 1883)

Small, oval, fairly shining. Pronotum at hind angles almost as finely punctate as in its central part. Primary punctures of elytra arranged in regular rows, rather shallow, secondary punctures barely perceptible. Aedeagus not studied. Length 4.5 mm. Described from W Andalusia (Serrania de Ronda).

***Cyrtonus scutellatus*** (FAIRMAIRE, 1883)

Upper side aeneous-greenish, pronotum and elytra with indistinct cupreous borders. Antenna dark testaceous, first antennomeron lighter. Similar to *punctipennis*, but sides of pronotum in hind part more parallel. Puncturation of upper side finer and body differently coloured. Aedeagus not studied. Length of body 6.0 mm. Described from Portugal.

***Cyrtonus strictus*** (FAIRMAIRE, 1883)

Externally similar to *puncticeps*, but antennae more slender and metapleurae barely punctate. Aedeagus not studied. Length of body 5.0 mm. Described from Central Spain (Montes de Toledo).

Genus ***Cystocnemis*** (MOTSCHOULSKY, 1860)

A small genus containing two species endemic to Transcaspia.

Key to species

1. Upper side rusty-reddish or pale brownish, in dark coloured specimens pitchy with paler borders. Anterior angles of pronotum obtuse or almost right, not protruding anteriorly. Punctures on elytra uniform. Length 5.8–8.0 mm (= *mohri* DACCORDI, 1975). Distributed in SE Kazakhstan ..... ***concolor*** KRAATZ, 1879.

- Uper side rusty-brown, on pronotum in basal part a black spot, sometimes strongly enlarged. Elytra with longitudinal black stripes or with large longitudinal discal spot. Anterior angles of pronotum broadly rounded, somewhat protruding anteriorly. Elytral punctures distinctly double. Length 6.0–8.0 mm. Distributed from E Kazakhstan to S Altai ..... **discoidea** (GEBLER, 1830).

Genus *Entomoscelis* CHEVROLAT, 1837

Literature: MADER 1943, LOPATIN 1967.

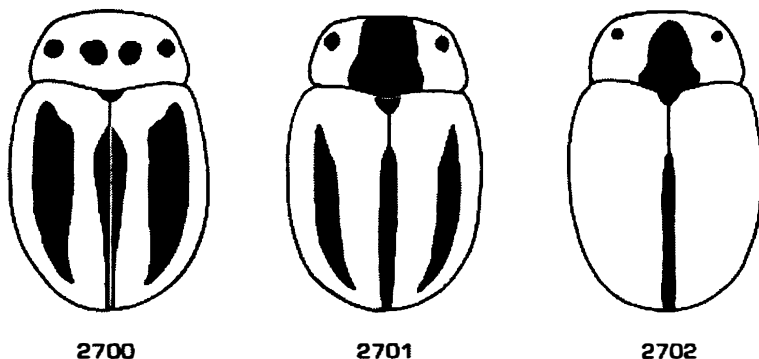
Key to subgenera

- 1. Upper side entirely metallic bronzy, often with bluish reflex ..... **Chrysollopsis** (p. 542).
- Upper side at least partly red with black or blackish marking ..... **Entomoscelis** s. str. (p. 543).

Subgenus *Chrysollopsis* ACHARD, 1922

= *Chrysollopsila* STRAND, 1935 (6?)

*Chrysollopsis* ACHARD, 1922 is often ranked as a distinct genus in the subtribe *Entomoscelina*. One species only. Body entirely dark coloured, on upper side metallic bronzy often with bluish reflex, underside pitchy or blackish. Pronotum uniformly convex without any depressions or furrows. Elytra convex, somewhat sharpened at apex, without humeral callus, puncturation partly arranged in longitudinal irregular rows, lateral sides broadly smooth. Externally similar to representatives of genus *Semenovia* (p. 605). Length 8.0 mm. Described from N China (Shantung) ..... **ecoffeti** (ACHARD, 1922).

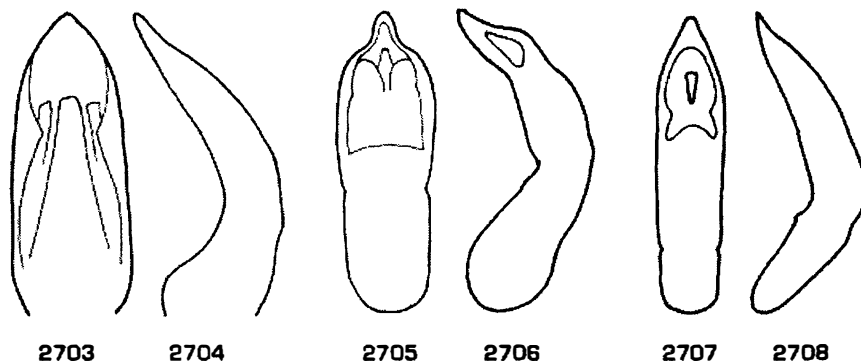


Figs 2700-2702. Pattern of upper side (after WARCHALOWSKI 1994): 2700 – *Entomoscelis rumicis*; 2701 – *E. adonidis*; 2702 – *E. suturalis*.



Key to species

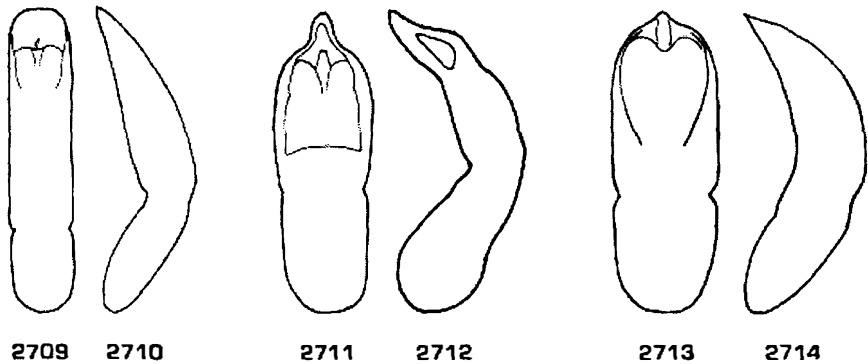
1. On pronotum black pattern form a transverse row of four spots (fig. 2700). Legs usually entirely red. General view as in plate LXVII, **phot. 600**. Length 6.0–6.5 mm. Distributed in southern Spain and in North Africa ..... *rumicis* (FABRICIUS, 1887).
- . On pronotum black pattern form a broad, longitudinal median stripe and two little spots laterally (figs 2701, 2702) ..... 2.
2. North-African species ..... 3.
- . European and Asiatic species ..... 4.
3. Legs red. Colouration of upper side as in *adonidis*, but median stripe on elytron usually absent. Length 5.8–7.0 mm. Distributed in Algeria .... *cornea* ABEILLE, 1897.
- . Legs black, tarsi and knees often reddish. Median stripe on elytron normally absent. Length 6.0–7.5 mm. Distributed in Morocco. In opinion of some authors a western form of *cornea* (thesis 3) ..... *occidentalis* ESCALERA, 1914.
4. Legs bicolorous, tibiae red, femora blackish. Black pattern on upper side similar as in *adonidis* (antithesis 6). Very tip of aedeagus (figs 2703, 2704) somewhat sharpened. Length 6.0–7.0 mm. Distributed in E Usbekistan and SE Kazakhstan ...  
..... *erythrocnema* JACOBSON, 1893.
- . Legs entirely black ..... 5.
5. Clypeus black ..... 6.
- . Clypeus (sometimes partly) red ..... 7.



Figs 2703-2708. Aedeagus in dorsal and lateral view (2703, 2704 after LOPATIN 1977, 2705, 2706 after LOPATIN 1967, 2707, 2708 after WARCHALOWSKI 1994): 2703, 2704 – *Entomoscelis erythrocnema*; 2705, 2706 – *E. pilula*; 2707, 2708 – *E. adonidis*.

6. Body very short and stout, length 5.0–6.0 mm. Aedeagus as in figs 2705, 2706. Distributed in Caucasian countries ..... *pilula* LOPATIN, 1967.
- . Body not particularly short and stout, length over 6.5 mm. General view as in plate LXVII, **phot. 601**. Very tip of aedeagus (figs 2707, 2708) obtusely rounded. Length usually 6.5–9.0 mm (= *trilineata* FABRICIUS, 1777). Variations: lateral spots on pronotum absent (ab. *hammarstroemi* JACOBSON, 1901), on elytron median stripe

- absent (ab. *dorsalis* FABRICIUS, 1777), upper side black, lateral margins of pronotum and elytra red (ab. *varentzowi* JACOBSON, 1895), body large, its length 8.5–10.0 mm (ab. *goliath* ABEILLE, 1897, a local form from Syria). On various *Brassicaceae*. Distributed from southern France to Mongolia ..... ***adonidis*** (PALLAS, 1771).
7. On pronotum small, lateral black spots absent ..... **8.**
- . On pronotum small, lateral black spots present ..... **9.**
8. On pronotum central large spot as in *adonidis* (antithesis 6). Elytron red with very large, blurred, dark, sometimes blackish area, lateral margins and suture red. General view as in plate LXVII, **phot. 603**. Aedeagus as in figs **2709, 2710**. Length 5.0–5.6 mm. Distributed in Mongolia, N China, E Siberia and Korea ..... ***orientalis*** MOTSCHULSKY, 1860.
- . On pronotum central large spot more narrowed anteriorly. Clypeus black with reddish anterior margin. Elytra black with orange lateral marginal stripes and with longitudinal, at scutellum broadened, orange stripe along suture. Length about 7.5 mm. Male unknown, species described from N China (Ningsia) based on two females only. Perhaps a form of *orientalis* (thesis 8) .... ***deserticola*** LOPATIN, 1967.
9. Length 6.5–7.5 mm. Colouring of body generally as in *adonidis* but median stripe on pronotum not reaching to anterior margin and on elytron black median stripe



Figs 2709-2714. Aedeagus in dorsal and lateral view (2709, 2710 orig., 2711-2714 after WARCHALOWSKI 1994): 2709, 2710 – *Entomoscelis orientalis*; 2711, 2712 – *E. suturalis*; 2713, 2714 – *Gastrophysa polygoni*.

- usually absent. General view as in plate LXVII, **phot. 602**. Aedeagus as in figs **2711, 2712**. Variations: on elytra black sutural stripe only (typical form), on each elytron black longitudinal stripe as in *adonidis* (ab. *sancta* MADER, 1943). Distributed in Romania, Bulgaria, southern part of Ukraine, Caspian area, Asia Minor, Caucasian countries and Near East ..... ***suturalis*** WEISE, 1882.
- . Length 6.0–7.0 mm. Remaining characters as in *suturalis* (= *melanostoma* GMELIN, 1790). Variation: on elytron median stripe absent (ab. *berytensis* REICHE et SAUCY, 1858). Perhaps conspecific (a southern form?) with *suturalis*. Distributed in Near East, another reports probably based on confusion with *suturalis* and *adonidis* ... ***sacra*** (LINNAEUS, 1758).

Genus *Falsocolaphellus* PIC, 1928

One species only. Upper side greenish black, labrum and legs testaceous. Length about 5.0 mm. Described from Syria ..... *syriacus* Pic, 1928.

Genus *Gastrolina* BALY, 1859

The genus *Gastrolina* BALY comprises two species distributed in E Asia.

Key to species

1. Pronotum very slightly narrowed in anterior part, its lateral margins perceptibly sinuate. Antennomeres 1–4 or 2–4 pale, legs usually bicolorous. General view as in plate LXVIII, **phot. 604**. Length 6.0–7.6 mm (= *japana* JACOBY, 1885). Distributed in E Siberia, N China and Japan (Hokkaido, Honshu, Shikoku) ..... *peltoidea* (GEBLER, 1832).
- . Pronotum very slightly broadened anteriorly, its lateral margins almost straight. Antennae black, legs usually also entirely black. General view as in plate LXVIII, **phot. 605**. Length 6.2–7.6 mm. Forms a few variations, described as subspecies: tarsomere 4 strongly bidentate below claws, pronotum entirely pale (typical form from China), as typical form, but pronotum black in the middle (ab. *thoracica* BALY, 1864), as *thoracica*, but tibiae testaceous (ab. *pallipes* CHEN, 1974 from Yunnan), tarsomere 4 feebly bidentate below claws, pronotum entirely pale (subspecies? *tonkinae* CHEN, 1931 from Yunnan and Tonkin. Distributed in E Siberia, China, N Indochina and Japan (Hokkaido, Honshu, Shikoku, Kyushu) ..... *depressa* BALY, 1859.

Genus *Gastrolinoides* CHŪJŌ et KIMOTO, 1960

The genus *Gastrolinoides* CHŪJŌ et KIMOTO, endemic to Japan, contains one species only. Upper side, antennomeres 1–3, tibiae except their basal part and underside (partly) yellowish-testaceous, remaining parts of body black. General view as in plate LXVIII, **phot. 606**. Length 4.9–6.0 mm. Distributed in Japan (Honshu, Shikoku, Kyushu) ..... *japonicus* (HAROLD, 1877).

Genus *Gastrophysa* CHEVROLAT, 1837

Literature: JOLIVET 1951.

In discussed area 7 species. Further 3 doubtful asiatic species: *G. virescens* GEBLER, 1843, *G. ruficeps* GEBLER, 1845 and *G. amphibia* MOTSCHULSKY, 1860, possibly belonging to other genera, not included in the key.

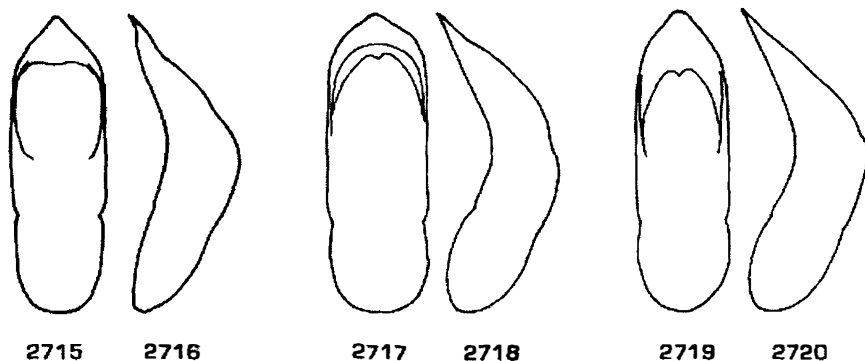
Key to subgenera

1. Wings normally developed. Body less stout, upper side variously coloured ..... *Gastrophysa* s. str. (p. 546).
- . Wings reduced. Body stout, upper side uniformly coloured, black-blue or black-violaceous with metallic sheen ..... *Exiguipenna* (p. 547).

Subgenus *Gastrophysa* s. str.

Key to species

1. Upper side pale, scutellum and sutural stripe black. Sternum, abdomen and legs black with greenish or bluish reflex. Length about 3.5–4.2 mm (= *suturalis* MOTSCHOUJSKY, 1860, *popovi* MARSEUL, 1888, *suturella* FAIRMAIRE, 1888, *amoena* WEISE, 1889). Distributed in Siberia, Mongolia and N China ..... *mannerheimi* STÅL, 1858.
- . At least elytra green or blue metallic ..... 2.
2. Upper side bicolorous: pronotum orange, elytra blue, green or violaceous with metallic sheen. General view as in plate LXVIII, **phot. 609**. Aedeagus as in figs **2713**, **2714**. Length 4.0–4.8 mm (= *elongata* JOLIVET, 1951). Variations: elytra blue or black-blue (typical form), elytra green or bronzy-green (ab. *ruficollis* FABRICIUS, 1781), elytra violaceous-purplish (ab. *obtusa* MÜLLER, 1776), antennae entirely black (ab. *nigricornis* JACOBSON, 1926) pronotum with great, blurred, dark spot in the middle (unnamed). More elongate forms from Central Asia were described as subsp. *elongata* JOLIVET, 1951. Distributed in almost all Europe, Asia Minor, Caucasian countries and Central Asia, introduced to N America ..... *polygona* (LINNAEUS, 1758).
- . Upper side uniformly with metallic gloss, green, blue, violaceous, or golden-green ..... 3.



Figs 2715–2720. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1994): 2715, 2716 – *Gastrophysa viridula*; 2717, 2718 – *G. analis*; 2719, 2720 – *G. unicolor*.

3. On average larger, length of body over 5.0 mm ..... 4.
- . On average smaller, length of body about 4.0–5.5 mm. General view as in plate LXVIII, **phot. 608**. Aedeagus as in figs **2715**, **2716**. Length 4.2–5.8 mm (= *raphani* HERBST, 1783, *rumicis* SCHRANK, 1785). Variations: upper side as above (typical form), upper side blue (ab. *cyanescens* WEISE, 1898), pronotum golden-green, elytra cupreous with greenish reflex, strongly shining (ab. *fulgurans* ACHARD, 1923), head and pronotum blue, elytra green (ab. *cyanicollis* MADER, 1931). In the discussed

- area forms two local subspecies: pronotum particularly strong and densely punctured, upper side usually green (subsp. *pennina* WEISE, 1882, occurring in Alps), punctures of pronotum very fine, in the middle almost disappearing (subsp. *caucasica* JOLIVET, 1951, occurring in Caucasus). Distributed in almost all Europe, Asia Minor, Caucasian countries and Central Asia. Reported also from East Siberia, Korea and United States, probably introduced ..... ***viridula*** (DEGEER, 1775).
4. Pronotum broadest in hind part, slightly narrowed anteriorly. Upper side dark green or violaceous, not strongly shining, very densely and finely punctured. Distributed in Mongolia and E Siberia ..... ***lenta*** (WEISE, 1887).
- . Pronotum broadest near or slightly behind the midlength. Humeral callus more protruding, puncturation of upper side fine, last abdominal segment of abdomen yellowish margined. Upper side usually very dark, black with bluish reflex or black-blue. Length 4.8–6.0 mm (= *tonkinea* ACHARD, 1925). Distributed in Mongolia, E Siberia, China, Japan and N Indochina ..... ***atrocyanea*** MOTSCHULSKY, 1860.

#### Subgenus *Exiguipecta* JOLIVET, 1951

##### Key to species

1. Body smaller, usually under 4.0 mm. Sides of apical part of abdomen rather broadly yellowish. Aedeagus as in figs 2717, 2718. Distributed in Balkans .....  ***analis*** REITTER, 1890.
- . Body on average greater, usually about 4.0 mm. Apical part of abdomen normally dark, sometimes with narrow yellowish margins. Aedeagus as in figs 2719, 2720 (= *janthina* SUFFRIAN, 1851). Distributed in Iberian Peninsula ..... ***unicolor*** MARSHAM, 1802.

#### Genus *Gnathomela* JACOBSON, 1895

Literature: LOPATIN 1972.

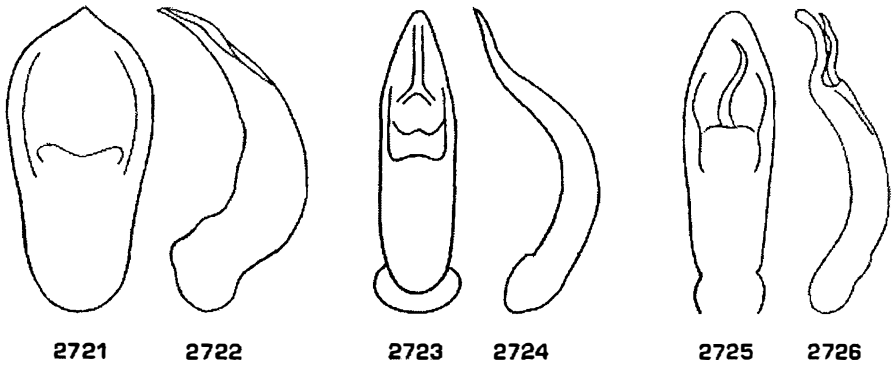
The genus *Gnathomela* JACOBSON includes 7 species distributed in Transcaspia.

##### Key to species

1. Pronotum very sparsely punctured, interstices smooth, much broader than diameter of punctures. Elytral primary punctures arranged in regular rows, intervals broad and smooth. General view as in plate LXVIII, **phot. 610**. Aedeagus as in figs 2721, 2722. Length 9.0–12.0 mm. Distributed in S Uzbekistan and in Turkmenistan .... ***meridionalis*** LOPATIN, 1972.
- . Pronotum more densely punctured, interstices not much broader than diameter of punctures ..... **2**.
2. Apical part of aedeagus (figs 2723, 2724) in dorsal view gradually narrowed, its very tip obtusely rounded, in lateral view apical part barely bent, almost straight. Body relatively slender. Primary punctures of elytra in anterior part arranged in regular semigeminate rows, intervals covered by extremely fine reticulation. In

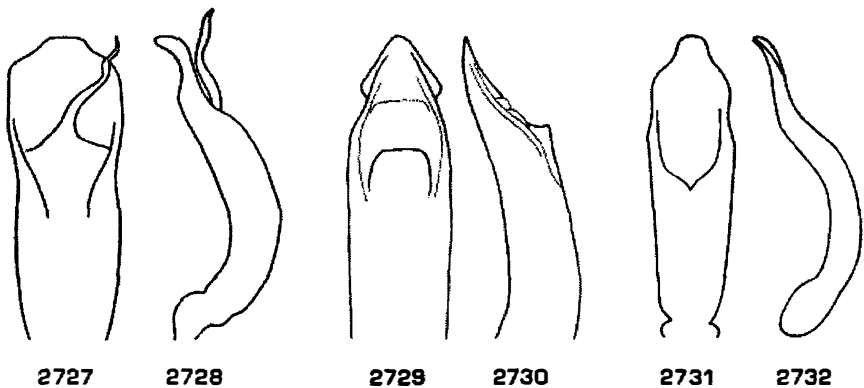
posterior half primary punctures very fine or disappearing. Length about 10.0 mm (= *chrysomeliformis* BOGACHEV, 1961). Known from Tadzhikistan only .....

- ..... ***dolens*** (KRAATZ, 1885).  
 -. Aedeagus formed differently ..... 3.



Figs 2721-2726. Aedeagus in dorsal and lateral view (2723, 2724 after LOPATIN 1990, remaining after LOPATIN 1977): 2721, 2722 - *Gnathomela meridionalis*; 2723, 2724 - *G. dolens*; 2725, 2726 - *G. praestans*.

3. Antennomere 3 shorter than antennomere 1 ..... 4.  
 -. Antennomere 3 not shorter than antennomere 1 ..... 5.



Figs 2727-2732. Aedeagus in dorsal and lateral view (2727, 2728 after LOPATIN 1977, remaining after LOPATIN 1990); 2727, 2728 - *Gnathomela mutica*; 2729, 2730 - *G. ovczinnikovi*; 2731, 2732 - *G. laevigata*.

4. Apex of aedeagus in dorsal view obtusely cut and shallowly emarginate. Length about 11.0 mm. Forms two subspecies: primary puncturation of pronotum fine or at most moderately strong (nominotypical subspecies), primary puncturation of pronotum strong (subsp. *nuratavica* LOPATIN, 1972). Nominotypical subspecies distributed

- in Kazakhstan (Karatau, Talass-Alatau) and Usbekistan (Karzhantau, Nuratau), subsp. *nuratavica* described from mountains Tshatkalskiy khrebet in Usbekistan ..... **valida** LOPATIN, 1972.
- . Apical part of aedeagus (figs 2725, 2726) narrowed and its very tip rounded. General view as in plate LXVIII, **phot. 611**. Length 10.0–11.0 mm. Distributed in mountains of Usbekistan and in Tadzhikistan ..... **praestans** LOPATIN, 1972.
5. Broad lamella on apex of aedeagus (figs 2727, 2728) very short. Length 8.0–10.0 mm. Distributed in mountains of E Usbekistan .... **mutica** LOPATIN, 1972.
- . Broad lamella on apex of aedeagus much longer ..... **6**.
6. Primary punctures on elytra not arranged in rows. Lateral borders of pronotum very weakly separated from disc. Aedeagus as in figs 2729, 2730. Length 10.5 mm ..... **ovczinnikovi** LOPATIN, 1990.
- . Primary punctures on elytra arranged in longitudinal rows. Lateral borders of pronotum distinctly separated from disc by longitudinal impression. General view as in plate LXVIII, **phot. 612**. Length 9.0–11.0 mm. Forms two subspecies differing in shape of aedeagus. Nominotypical subspecies (figs 2731, 2732) distributed in mountains of E Usbekistan and subsp. *kirghizica* LOPATIN, 1990 described from Kirgisia ..... **laevigata** LOPATIN, 1972.

Genus **Gonioctena** CHEVROLAT, 1837

Key to subgenera

1. Hind wings absent. One species from Altai and ?NE European Russia ..... **Cercyonops** (p. 550).
- . Hind wings present ..... **2**.
2. Pronotum without setigerous punctures in fore and in hind angles. Preapical antennomeres flattened, broader than long. E Asiatic species only ..... **Brachyphytodecta** (p. 550).
- . Pronotum with setigerous punctures at least on hind angles ..... **3**.
3. Setigerous punctures present on both fore and hind angles E Asiatic species only ..... **Sinomela** (p. 562).
- . Setigerous punctures on hind angles of pronotum ..... **4**.
4. Body somewhat flattened, black, a few basal antennomeres and ground of elytra red. One species from China only ..... **Platyphytodecta** (p. 562).
- . Not as above ..... **5**.
5. Body short-oval, strongly convex. Body elongate, moderately convex. Humeral calli well-developed ..... **8**.
6. Humeral calli absent, primary punctures on elytra fine, fore tibiae with a tooth .... **7**.
- . Humeral calli present, primary punctures on elytra strong, fore tibiae without tooth ..... **Spartophila** (p. 563).
7. Pronotum feebly convex, in lateral part usually with strong points. Elytral punctures arranged in 9 regular equidistant rows ..... **Spartoxena** (p. 564).
- . Pronotum strongly convex, on whole surface finely punctate. Elytral punctures confuse or partly arranged in geminate rows ..... **Spartomena** (p. 563).

- 8. Fore tibia with a great tooth. On pronotum setigerous fovea at the posterior angles only ..... *Gonioctena* s. str. (p. 551).
- Fore tibia without tooth. On pronotum setigerous fovea at all the angles .....  
..... *Goniomena* (p. 560).

Subgenus *Brachyphytodecta* BECHYNÉ, 1948

In discussed area five species distributed in E Siberia, Korea, N China and Japan.

Key to species

- 1. Length of body usually 9.0–11.0 mm. Femora red, tarsi and tibiae black. Body large, very broad, pronotum very short, about 4 × shorter than broad, upper side red. General view as in plate LXIX, **phot. 613**. Representative of Oriental fauna distributed in S China and Indochina, reported also from Sikang ..... *lesnei* (CHEN, 1931).
- Length of body under 7.0 mm ..... 2.
- 2. Pronotum and elytra concolorous, reddish or brownish ..... 3.
- Pronotum and elytra not concolorous ..... 4.
- 3. On average smaller. Scutellum black. Length 4.5–5.8 mm. Distributed in ?Tuva, E Siberia, Korea, China, and N Vietnam (*scutellaris* BALY, 1862, *thoracica* BALY, 1862 nec FOURCROY, *dichroa* FAIRMAIRE, 1888, *foochowensis* GRUEV, 1989) .....  
..... *fulva* (MOTSCHULSKY, 1860).
- On average larger. Scutellum reddish or brownish. Length 5.5–7.0 mm. Distributed in China and Tonkin ..... *flavipennis* (JACOBY, 1888).
- 4. Head, pronotum and scutellum black, elytra red, sometimes darkened on disc, rarely almost entirely black. Elytron with eleven longitudinal rows of punctures ... 5.
- Upper side pitchy or blackish, lateral sides of pronotum and/or proepipleura reddish. Dark aberrations of *fulva* (thesis 16).
- 5. Apical part of aedeagus in dorsal view (figs 2733, 2734) sharpened. Length 4.5–6.0 mm. General view as in plate LXIX, **phot. 614**. Variations: elytron with large, dark, blurred spot on disc (ab. *plagipennis* ACHARD, 1924), upper side almost entirely blackish (ab. *tenebrosa* WEISE, 1910). Distributed in Japan (Hokkaido, Honshu, Shikoku, Kyushu) ..... *rubripennis* BALY, 1862.
- Apical part of aedeagus in dorsal view (figs 2735, 2736) almost parallel, obtusely rounded. Length 4.5–5.5 mm. Described from Japan (Kyushu) .....  
..... *kidoi* TAKIZAWA et DACCORDI, 1998.

Subgenus *Cercyonops* JACOBSON, 1901

One species only. Body black, elytra testaceous usually with black pattern. Length about 4.5 mm. Variations: elytra testaceous with sutural margin black (ab. *simplex* JACOBSON, 1901), elytra testaceous with two spots on each (2, 2) and sutural margin black (typical form), elytra with longitudinal stripe and one spot on each black (ab. *sesquialtera* JACOBSON, 1901), black spots on elytra variously fused (ab. *hieroglyphica* JACOBSON, 1901), elytra



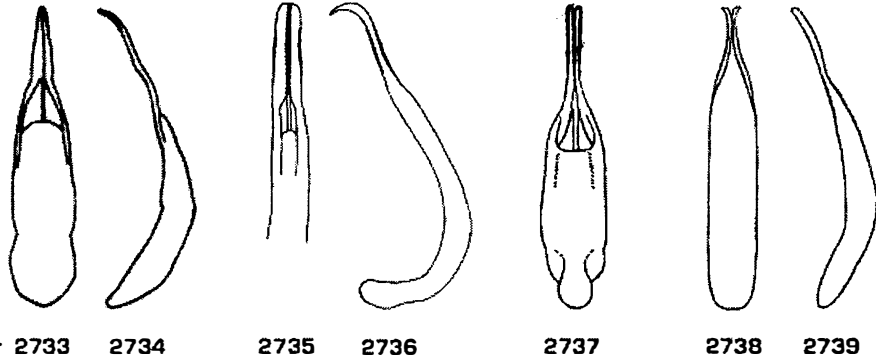
black with basal, lateral and apical margins testaceous (ab. *limbata* JACOBSON, 1901), elytra black, lateral and apical margins testaceous (ab. *menetriesii* GEBLER, 1841). General view as in plate LIX, phot. 526. Described and known from Altai, mentioned also from NE of European Russia ..... *caraganae* (GEBLER, 1823).

Subgenus *Gonioctena* s. str.

In discussed area about 25 species unambiguously determinable by shape of aedeagus only. External characters and particularly colouration of upper side are very variable in all here belonging species.

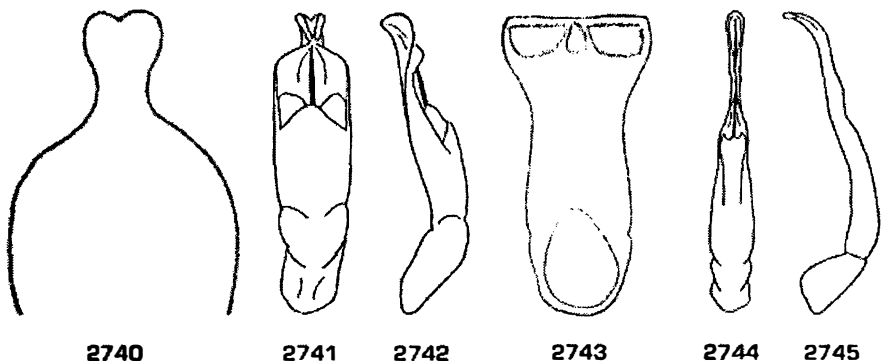
Key to species

- 1. Legs entirely pale, yellowish, testaceous or reddish-brown ..... 2.
- . Legs partly or entirely black, sometimes entirely pitchy or dark brown ..... 15.
- 2. Apical part of aedeagus (figs 2764, 2765) not distinguished, apex in dorsal view shortly narrowed with short, transverse, in the middle incised lamella, flagellum protruding. In lateral view on each side of apical part an impression. Here pale forms of *sibirica* (thesis 17).
- . Apical part of aedeagus distinguished, or at least distinctly, gradually narrowing anteriorad ..... 3.
- 3. Apex of aedeagus incised, forked or bilobed. E Palearctic species ..... 4.
- . Apex of aedeagus entire: transversely cut, rounded or sharpened ..... 8.
- 4. Narrowed apical part of aedeagus slender and long, about 2 × shorter than tubular part ..... 5.
- . Apical part of aedeagus much shorter ..... 6.



Figs 2733-2739. Aedeagus in dorsal and lateral view (2733, 2734 after TAKIZAWA 1985; 2735, 2736 after TAKIZAWA and DACCORDI 1998; 2737 after MEDVEDEV 1992; 2738, 2739 after KIMOTO and TAKIZAWA 1994): 2733, 2734 – *Gonioctena (Brachyphytodecta) rubripennis*; 2735, 2736 – *G. (B.) kidoi*; 2737 – *G. (Gonioctena) sundmani*; 2738, 2739 – *G. (G.) honshuensis*.

5. Apex of aedeagus (fig. 2737) not forked. Head, scutellum and underside black. Pronotum and elytra rusty-testaceous, on pronotum two roundish black spots in hind part, on elytra 2 or 3 spots in anterior part, sometimes black markings on elytra absent. Length 4.7–6.0 mm. Distributed from Mongolia to Kamchatka and basin of Amur ..... *sundmani* (JACOBSON, 1901).
- . Apex of aedeagus (figs 2738, 2739) narrowly but distinctly forked. Colouration of body very variable. Ground of upper side reddish brown, on pronotum sometimes two triangular blackish spots, elytron with 1–5 black or blackish spots. Legs usually entirely pale, in dark variations partly blackened. Length 6.0–7.0 mm (= *sibirica* BECHYNÉ, 1948, nec WEISE, 1893). Forms four subspecies: length of aedeagus about 3.0 mm, legs usually partly darkened (nominotypical subspecies from Japan), as previous, but legs pale (subsp. *chujoi* MEDVEDEV, 1966 from Kuriles), length of aedeagus under 2.6 mm, antennae entirely pale or with darkened antennomeres 10–11 (subsp. *sachalinensis* MEDVEDEV, 1978 from Sakhalin), as previous, but antennomeres 6–11 or 8–11 darkened (subsp. *ochotensis* MEDVEDEV, 1978, from Magadan and Kamchatka). Distributed in E Siberia, N China, Kuriles, Korea and Japan (Hokkaido, Honshu) ..... *honshuensis* NAKANE, 1963.
6. Apical part of aedeagus (fig. 2740) short and broad, narrowed basally. Head black except mouth parts and bilobed spot on frons. Pronotum with two triangular black spots at hind margin. Scutellum, shortened sutural stripe and 5 spots on each elytron black. On each elytron 5 black spots, remaining surface of pronotum and elytra rusty-brownish. Length 5.0–6.0 mm. Distributed in Ussuria and S Korea ..... *laeta* MEDVEDEV, 1973.
- . Apical part of aedeagus not narrowed bally ..... 7.



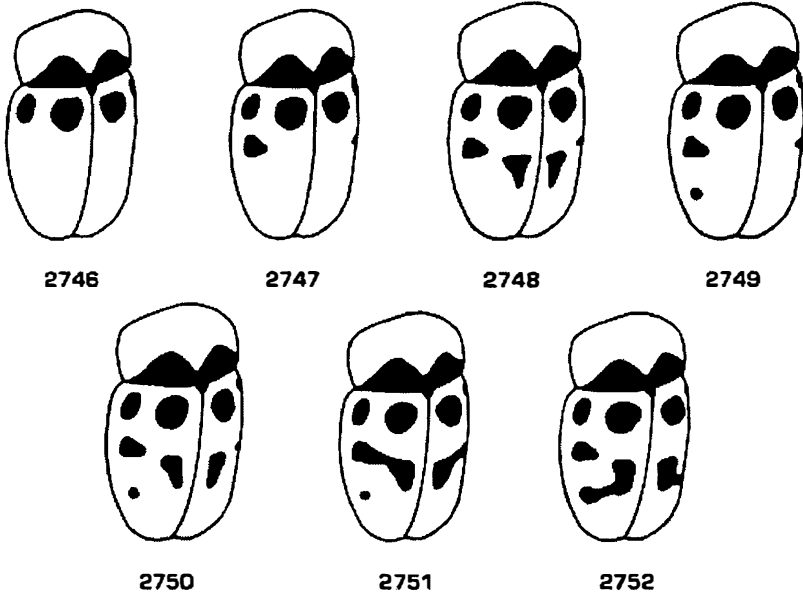
Figs 2740-2745. Aedeagus or its apical part in dorsal and lateral view (2740, 2743 after MEDVEDEV 1922, remaining after KIMOTO and TAKIZAWA 1994): 2740 – *Gonioctena (Gonioctena) laeta*; 2741, 2742 – *G. (G.) hiranoi*; 2743 – *G. (G.) jacobsoni*; 2744, 2745 – *G. (G.) japonica*.

7. Apical part of aedeagus (figs 2741, 2742) in dorsal view short and broad, in lateral view distinctly elevated. Head and scutellum black, sutural margin blackened except for on basal 1/3. On pronotum two basal black patches, sometimes fused. On

each elytron 5 black spots. In paler coloured specimens two brownish spots on frons, in darker coloured an additional small black spot before scutellum, fused with both lateral spots. Length 4.7–5.7 mm. Described from Japan (Honshu) .....

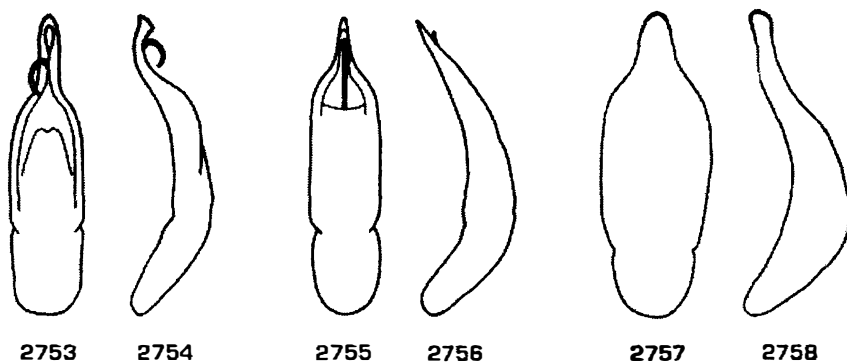
..... *hiranoi* TAKIZAWA, 1989.

- Apical part of aedeagus narrow, parallel, on apex slightly forked. Go back to thesis 4.
- 8. Apical part of aedeagus (fig. 2743) very strongly broadened, distinctly more broad than tubular part, and suddenly, transversely cut. Head, scutellum and underside black, remaining parts of body pale rusty-yellowish. Length 5.0–6.5 mm. Distributed in Mongolia and E Siberia ..... *jacobsoni* OGLOBLIN et MEDVEDEV, 1956.
- Apical part of aedeagus always narrower than tubular part ..... 9.
- 9. Apical part of aedeagus (figs 2744, 2745) very long, longer than 1/2 of tubular part. Ground of upper side rusty-testaceous, two basal black spots on pronotum usually fused, on each elytron 5 spots, preapical spots elongate, situated longitudinally. Length 6.5–7.5 mm (*gracilicornis* MATSUMURA, 1931 nec KRAATZ, 1879, *rufipes* BALY, 1874 nec DEGEER, 1777). Distributed in Kuriles and Japan (Hokkaido, Honshu, Shikoku, Kyushu) ..... *japonica* CHŪJŌ et KIMOTO, 1960.
- Apical part of aedeagus as long as or shorter than 1/2 of tubular part ..... 10.
- 10. Apical part of aedeagus short and broad, basally narrowed, flagellum protruding. Here *G. viminalis* (thesis 24) subsp. *rufa* KRAATZ, 1879 with entirely or almost entirely reddish legs and strongly reduced black marking of upper side, distributed from Sayan Mountains to NE China and Korea.
- Apical part of aedeagus differently formed ..... 11.



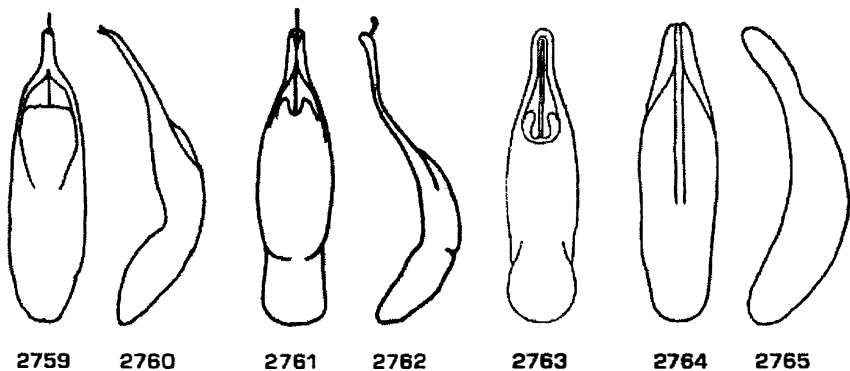
Figs 2746-2752. *Goniocetena (Goniocetena) decemnotata*, variations (after WARCHAŁOWSKI 1994; 2746 – ab. *praecox* BECHYNÉ 1947; 2747 – ab. *sexpunctata* FABRICIUS 1787; 2748 – ab. *tremulae* BECHYNÉ 1947; 2749 – ab. *populi* BECHYNÉ 1947; 2750 – typical form; 2751 – ab. *conjuncta* REINECK 1910; 2752 – ab. *taeniolata* BECHYNÉ 1947.

11. Apical part of aedeagus (figs 2753, 2754) long, about 2 × shorter than tubular part, flagellum thin, protruding. Legs usually entirely yellowish red, tarsi sometimes darkened. Upper side reddish with black pattern. Length 5.0–6.0 mm (= *sexpunctata* FABRICIUS, 1787 nec LINNAEUS, 1758, *rufipes* DEGEER, 1777 nec LINNAEUS 1758). Variations and their names see figs 2746–2752. On *Salicaceae*. Transpalaeartic species, distributed from British Isles to Japan ..... *decemnotata* (MARSHAM, 1802).
- . Apical part of aedeagus shorter, at least 3 × shorter than tubular part ..... 12.
12. Apical part of aedeagus (figs 2755, 2756) small, narrowed anteriorly. Antenna short, reaching to basis of elytra only. Body bicolorous. Apical 5–6 antennomeres, mid part of pronotum, underside, femora and elytral pattern (if present) black. Basal part of antennae, sides of pronotum, elytra and mid part of tibiae yellow, ochraceous or light brick-red. Aedeagus as in figs 1731, 1732. Length usually 6.0–7.0 mm, sometimes smaller, in extreme cases hardly 5.5 mm (= *triandrae* SUFFRIAN, 1851). Over 20 variations are described; the most important: elytra uniformly yellowish or reddish (typical form), pronotum bicolorous, on each elytron 5 black spots (ab. *decostigma* DUFFSCHMID, 1825), pronotum bicolorous, black pattern in anterior part of elytra fused (ab. *bohémica* ACHARD, 1924), pronotum black, elytra uniformly yellow or reddish (ab. *kraatzii* WESTHOFF, 1882), pronotum entirely black, on each elytron 5 black spots (ab. *nigricollis* WESTHOFF, 1882), upper side entirely black (ab. *satanas* WESTHOFF, 1882). Forms two subspecies: on elytra intervals reticulated, secondary punctures fine, surface in male moderately shining, in female matt (nominotypical subspecies), on elytra intervals shining in both sexes, secondary puncturation stronger (subsp. *bergrothi* JACOBSON, 1901 = *orientalis* WEISE, 1884, *correspondens* JACOBSON, 1901, *simplex* JACOBSON, 1901, *mutata* ACHARD, 1924), occurring from Altai to Pacific Coast). Transpalaeartic species, distributed from northern Spain and Norway to Mongolia and Sakhalin ..... *linnaeana* (SCHRANK, 1781).
- . Apical part of aedeagus larger, gradually narrowed toward apex, its very tip obtusely rounded. Three species, perhaps conspecific with *gracilicornis* (thesis 30), very variably coloured, similar as in *sibirica* (thesis 17) ..... 13.



Figs 2753-2758. Aedeagus in dorsal and lateral view (2759, 2760 after WARCHALOWSKI 1994; 2755, 2756 after MEDVEDEV 1992; 2757, 2758 after KIMOTO and TAKIZAWA 1994): 2753, 2754 – *Goniocтена* (*Goniocтена*) *decemnotata*; 2755, 2756 – *G. (G.) linnaeana*; 2757, 2758 – *G. (G.) takahashii*.

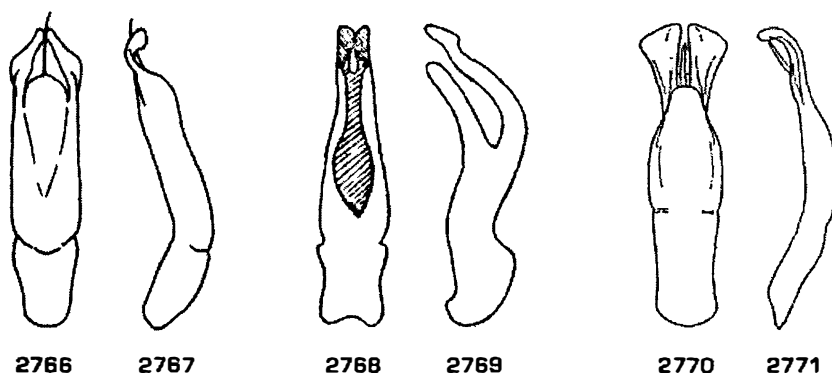
13. Outline of aedeagus as in figs **2757, 2758**, its apical part shorter and broader. Length 5.0–6.0. Described from Japan (Honshu, Shikoku) ..... **takahashii** NAKANE, 1963.
- . Outline of aedeagus different, its apical part narrower ..... **14.**
14. Femora black, tibiae reddish. Larger, general outline more stout and robust. Aedeagus as in figs **2759, 2760**. Length 7.0–8.0 mm. Distributed in NE China and Korea. Here *sungkangensis* KIMOTO et KAWASE, 1966 (thesis 30), perhaps conspecific with *gracilicornis* (thesis 30), probably its eastern race, differing from nominal species by larger body, but considered also as distinct species.
- . Legs entirely reddish. Smaller, general outline of body more slender ..... **15.**
15. Aedeagus as in figs **2761, 2762**. Length 5.0–6.5 mm. Described from Korea, perhaps conspecific with *ogloblini* (antithesis 15) ..... **suwai** TAKIZAWA, 1985.
- . Aedeagus as in fig **2763**. Length 5.0–6.5 mm. Described from E Siberia, reported also from Mongolia ..... **ogloblini** MEDVEDEV et DUBESHKO, 1972.



Figs 2759-2765. Aedeagus in dorsal and lateral view (2759-2762 after TAKIZAWA 1985, remaining after MEDVEDEV 1992): 2759, 2760 – *Gonioctena (Gonioctena) sungkangensis*; 2761, 2762 – *G. (G.) suwai*; 2763 – *G. (G.) ogloblini*; 2764, 2765 – *G. (G.) sibirica*.

16. Apex of aedeagus incised, forked or bilobed ..... **17.**
- . Apex of aedeagus entire: transversely cut, rounded or sharpened ..... **21.**
17. Apical part of aedeagus (figs **2764, 2765**) not distinguished, apex in dorsal view shortly narrowed with short, transverse, in the middle incised lamella, flagellum protruding. In lateral view on each side of apical part an impression. Colouration very variable. Body entirely pale or head, legs, underside and pronotum black, rarely also blurred spots on elytra. Length 5.2–6.9 mm (= *sorbi* MOTSCHULSKY, 1860 nec GRIMMER, 1841, *sobrina* WEISE, 1916). Distributed in Mongolia, E Siberia, Kamchatka and Japan (Hokkaido) ..... **sibirica** (WEISE, 1893).
- . Apical part of aedeagus distinguished, broadened or at least distinctly, gradually narrowing anteriorly ..... **18.**
18. Apical part of aedeagus (figs **2766, 2767**) broadened basally, its very tip incised, in lateral view dorsally bent. Externally similar to *sibirica* (thesis 17). Length 5.5–6.6 mm. Distributed in E Siberia and Korea ..... **cheni** (BECHYNÉ, 1947).
- . Apical part of aedeaguss not broadened basally ..... **19.**

19. Aedeagus very unusually formed (figs 2768, 2769), in lateral view divided into ventral and dorsal part. Body large, upper side red brick, scutellum black, antennomeres 5–11 or 6–11 black, legs black, mid part of tibiae red. Length 7.2–8.4 mm (= *ussuriensis* MEDVEDEV, 1964). Distributed in Ussuria and in Japan (Honshu) ..... **kamiyai** (KIMOTO, 1963).
- . Aedeagus not divided into ventral and dorsal part, apical lobes of aedeagus distinctly separated ..... **20.**
20. Apical lobes of aedeagus (figs 2770, 2771) large, flat, in dorsal view narrowly fan-shaped. Underside black, pronotum and elytra reddish brown. Length 7.0 mm. Described from Japan (Honshu) based on one male only ..... **shibatai** TAKIZAWA, 1982.
- . Apical lobes of aedeagus (figs 2776, 2777) rounded. Black, elytra reddish brown, antennomeres 1–5 or 1–6 brownish. Described from Japan (Honshu), based on two specimens only ..... **morimotoi** NAKANE, 1963.

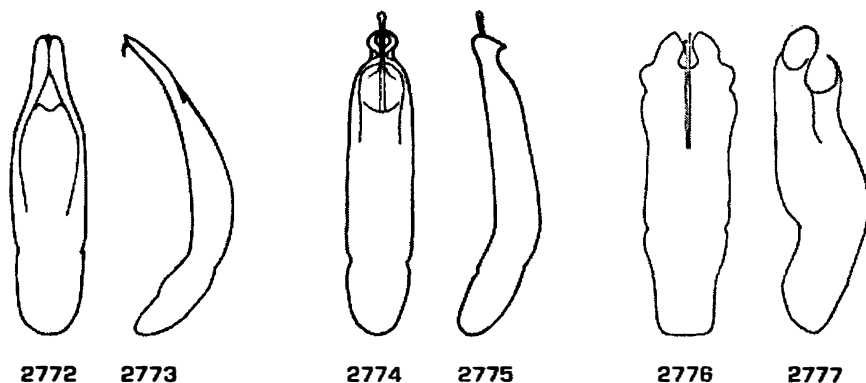


Figs 2766–2771. Aedeagus in dorsal and lateral view (2766–2767 after BECHYNE 1947; 2768, 2769 after TAKIZAWA 1985; 2770, 2771 after KIMOTO and TAKIZAWA 1994): 2766, 2767 – *Goniocтена (Goniocтена) cheni*; 2768, 2769 – *G. (G.) kamiyai*; 2770, 2771 – *G. (G.) shibatai*.

21. Apical part of aedeagus long and narrow. Here forms of *sundmani* and *honshuensis* (antithesis 5) with partly darkened legs.
- . Apical part of aedeagus not particularly long and narrow ..... **22.**
22. Surface of pronotum shining. Apical part of aedeagus relatively broad, gently narrowed anteriorly (figs 2772, 2773). Surface of pronotum shining. Lateral sides of pronotum in posterior part parallel. Tarsi (usually), most part of tibiae, basal part of antennae and elytra entirely brick-red, remaining parts of body black. Length 4.5–5.5 mm (*lurida* DUFTSCHMID, 1825, nec SCOPOLI, 1763). Variations: near anterior angles of pronotum two blurred, longitudinal, red spots (unnamed), elytra black, reddish margined (ab. *limbatipennis* ACHARD, 1924), upper side entirely black (ab. *infrafnalis* PENECKE, 1901 = *nigrivestis* REITTER, 1912). One subspecies is described: body on average smaller, intervals of elytral rows shining, covered by strong and dense puncturation (subsp. *borealis*, MEDVEDEV, 1963). Lives on *Salicaceae* (*Populus tremula* L., *Salix caprea* L. &c.). Borealpine species. European populations distributed

in Fennoscandia and in mountains (Pyrenees, Alps, Jura, Ardennes, Giant Mountains, Carpathians), Asiatic populations in E Siberia; the subsp. *borealis* was described from Kamchatka ..... *flavicornis* (SUFFRIAN, 1851).

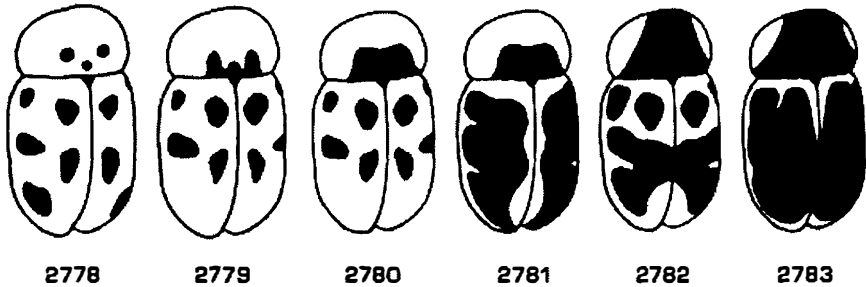
- Surface of pronotum reticulated, shape of aedeagus different ..... 23.
- 23. Antennomeres 3 and 5 subequal. On elytra intervals in both sexes shining, secondary punctures distinct and dense ..... 24.
- Third antennomere 1.5–2 × longer than the 5. On elytra intervals in male shining, in female often almost matt, secondary punctures perceptible, but somewhat indistinct ..... 26.



Figs 2772–2777. Aedeagus in dorsal and lateral view (2776, 2777 after KIMOTO and TAKIZAWA 1994, remaining after WARCHALOWSKI 1994): 2772, 2773 – *Gonioctena (Gonioctena) flavicornis*; 2774, 2775 – *G. (G.) viminalis*; 2776, 2777 – *G. (G.) morimotoi*.

- 24. Legs entirely black. Elytral pattern distinct. Colouring of body very variable. General view as in plate XLII, **phot. 375**. Aedeagus as in figs 2774, 2775. Length 5.4–7.0 mm (= *decempunctata* LINNAEUS, 1758, *haemorrhoidalis* SCOPOLI, 1763, *fridrichsdalensis* MÜLLER, 1764, *baaderi* PANZER, 1794, *collaris* GRADL, 1882). About 30 “varietates” considered recently as synonyms and over 90 (sic!) colour variations are described; the most important aberrations and their names see figs 2778–2783. Lives on different *Salix*-species and on mountain ash (*Sorbus aucuparia* L.). Transpalearctic species, distributed from Ireland to NE Siberia and Korea ..... *viminalis* (LINNAEUS, 1758).
- Tibiae at least partly reddish. Elytra uniformly red or brownish (in melanotic forms black), dark pattern absent or indistinct and blurred ..... 25.
- 25. Apical part of aedeagus short, narrowed basally. Aedeagus (figs 2784, 2785) in lateral view almost S-like bent. Antennae distinctly bicolorous: basal part yellowish red, 4–5 apical antennomeres blackened. Remaining part of antennae, tibiae and tarsi reddish brown. Pronotum dark red brick with black pattern, usually in form of two basally fused longitudinal stripes, sometimes entirely black. Elytra red brick, always without pattern, in melanotic aberrations darkened or entirely black. Punctures of

- pronotum in the middle fine and heterogenous, laterally very strong and deep. Elytral punctures strong, arranged in regular rows, in apical part usually somewhat confused. Length 5.5–7.0 mm. Variations: pronotum entirely black (ab. *obscuricollis* LEEDER, 1950), upper side entirely brownish black (ab. *nigrobrunnea* LEEDER, 1950). Endemic to Alps ..... **holdhausi** (LEEDER, 1950).
- . Apical part of aedeagus formed differently, tubular part suddenly cut anteriorly, apical part very distinctly distinguished, narrower at base, slightly but distinctly broadened at apex (figs 2786, 2787). Antennae towards apex gradually, feebly darkened. Colouration and sculpture of body as in *holdhausi* (thesis 5). Length 5.0–6.5 mm. Variations: reddish colour on pronotum divided into three longitudinal spots or stripes (typical form), pronotum entirely black, elytra dark brick-red (ab. *seminigra* WEISE, 1893), upper side entirely black (ab. *infernalis* PENECKE, 1901). Distributed in Eastern Alps ..... **kaufmanni** (MILLER, 1881).
26. Apical part of aedeagus (figs 2755, 2756) well distinguished, but small, narrowed anteriorly. Here variations of *linnaeana* (thesis 12) with darkened legs.
- . Apical part of aedeagus not as above ..... **27**.
27. Apical part of aedeagus (fig. 2788) short, narrow, parallel, with rounded apex. Antennomeres 7–10 relatively broad and short. Ground of upper side reddish brown, on pronotum two large black spots at hind margin, on each elytron 5 black spots (2, 2, 1). Described from Mongolia ..... **janovskii** MEDVEDEV, 1976.
- . Apical part of aedeagus not as above ..... **28**.

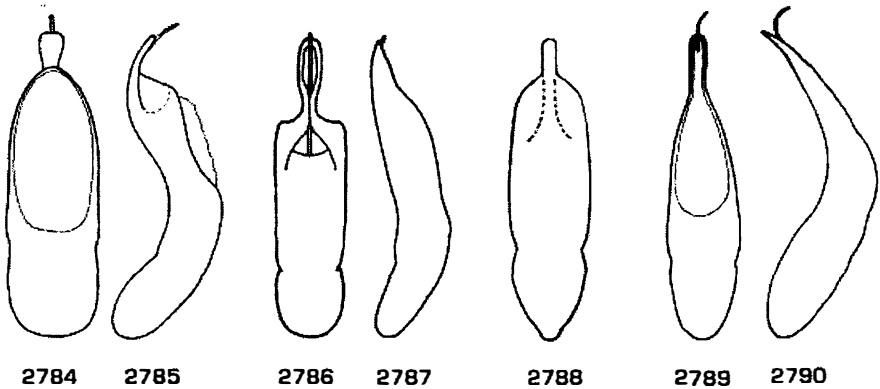


Figs 2778–2783. *Gonioctena* (*Gonioctena*) *vimalis*, variations (after WARCHAŁOWSKI 1994): 2778 – ab. *trimaculatis* PIC 1924; 2779 – ab. *marekorum* BECHYNÉ, 1947; 2780 – ab. *quadripunctata* HEYDEN, 1883; 2781 – ab. *baaderi* PANZER, 1794; 2782 – ab. *xnotata* BECHYNÉ, 1947; 2783 – ab. *nigrescens* GRADL, 1882.

28. Body smaller (4.0–5.0 mm in male, 4.5–5.5 mm in female), primary punctures on elytra rather strong. Body in male more slender and more shining than in female. Aedeagus as in figs 2789, 2790. General view as in plate LXIX, **phot. 617**. About 25 variations are described. The most important aberrations: pronotumbicolorous, elytra uniformly red (ab. *rufula* KRAATZ, 1879), pronotum black, elytra uniformly red (ab. *bicolor* HEYDEN, 1883), pronotum bicolorous, on each elytron 2–5 black spots (typical form and a number of aberrations), pronotum red, elytra black, reddish margined (ab. *ruficollis* WEISE, 1891), pronotum bicolorous, elytra black, reddish margined



- (*ab. marginata* GRADL, 1882), pronotum black, elytra black, reddish margined (*ab. eppelsheimi* WEISE, 1884), pronotum bicolorous, elytra black (*ab. immarginata* ACHARD, 1924), upper side entirely black (*ab. aethiops* HEYDEN, 1883). Distributed in Alps, reported also from Pyrenees. Possibly conspecific with *arctica* (thesis 29) ..... *nivosa* (SUFFRIAN, 1851).
- . Body on average larger, primary punctures on elytra rather fine ..... **29.**



Figs 2784-2790. Aedeagus in dorsal and lateral view (2786, 2787 after WARCHALOWSKI 1994; 2788 after MEDVEDEV 1976, remaining after WARCHALOWSKI 2003): 2784, 2785 - *Gonioctena (Gonioctena) holdhausi*; 2786, 2787 - *G. (G.) kaufmanni*; 2788 - *G. (G.) janovskii*; 2789, 2790 - *G. (G.) nivosa*.

29. Pronotum and legs entirely black, rarely lateral sides of pronotum red. On each elytron 5 black spots. Body in both sexes slender, upper side shining. Upper side bicolorous, red-black, black pattern as in figs **2791-2793**. Aedeagus similar as in *nivosa* (thesis 28). Length 5.0-6.5 mm (= *decaspilota* ACHARD, 1924, *norvegica* STRAND, 1936). Variations: lateral sides of pronotum red, on each elytron 5 black spots, as in fig. **2791** (*ab. affinis* GYLLENHAL, 1808), pronotum black, on elytra two middle spots joined as in fig. **2792** (*ab. fennica* BECHYNÉ, 1947), pronotum black, on elytra three spots joined as in fig. **2793** (*ab. hamata* ACHARD, 1924), upper side entirely black (*ab. aterrima* HELLÉN, 1937). Subpolar species, distributed in northern part of Fennoscandia, Siberia, Kamchatka and Sakhalin. Possibly subpolar race of the boreo-alpine species *nivosa* (thesis 28) only, differing from nominotypical subspecies by darker colouration of body and somewhat finer punctured elytra ..... *arctica* (MANNERHEIM, 1853).
- . Pronotum red with two fused black spots at hind margin, tibiae partly red ..... **30.**
30. Antennae longer, in male reaching to middle of body. Aedeagus as in figs **2757, 2758, 2796**. Head and scutellum black. In pale variations black marking reduced: on pronotum two separate spots, on elytra black pattern disappear. Length 5.2-6.8 mm (= *signaticollis* MADER, 1937, *kiberi* CHŪJŌ, 1941, *munaguro* CHŪJŌ, 1941, *?sungkangensis* KIMOTO, 1966). See also thesis 14. Distributed from Altai to Siberia and in N China ..... *gracilicornis* (KRAATZ, 1879).

- Antennae shorter, in male reaching to humeral callus. Aedeagus as in fig. 2797. Length 6.0–7.0 mm. Distributed in E Siberia, NE China and Korea ..... *coreana* (BECHYNÉ, 1947).

Subgenus *Goniomena* MOTSCHULSKY, 1860

Key to species

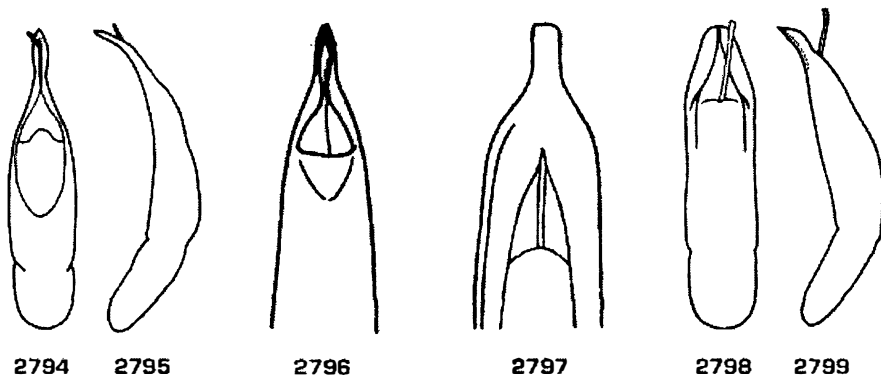
- 1. Pronotum broadest at basis, its sides feebly rounded. Apex of aedeagus symmetrical. Antennae robust ..... 2.
- Pronotum broader before basis, its sides rounded. Apex of aedeagus asymmetrical. Antennae rather slender ..... 3.



Figs 2791-2793. *Gonioctena* (*Gonioctena*) *arctica*, variations (after WARCHALOWSKI 1994): 2791 – ab. *affinis*; 2792 – ab. *fennica*; 2793 – ab. *hamata*.

- 2. Humeral callus indistinct. Hind wings shortened, shorter than elytra. Hind part of head usually yellowish, rarely blackened. Upper side in living insects straw-coloured, in dried specimens ochraceous or amber, in aberrations with black pattern or in most part blackish. Body shorter and stouter as in *quinquepunctata* (thesis 3). Aedeagus as in figs 2798, 2799. General view as in plate LXIX, phot. 618. Length 4.7–7.3 mm (= *frontalis* OLIVIER, 1807). About 45 aberrations are described; the most important aberrations: body entirely pale (typical form), upper side pale, underside brown or blackish (ab. *brunneiventris* KASZAB, 1962), underside darkened, pronotum pale, on elytra black spots (ab. *decipiens* WEISE, 1884), underside blackish, on pronotum and elytra undefined blackish pattern (ab. *borealis* WEISE, 1884), head, pronotum, scutellum and legs brownish red, elytra and abdomen entirely black (ab. *nigripennis* WEISE, 1893), pronotum, elytra and underside black (ab. *frontalis* WEISE, 1884). Distributed in western Palaearctic from southern France, The British Isles and Norway to central Siberia ..... *pallida* (LINNAEUS, 1758).
- Humeral callus distinct. Hind wings longer than elytra. Hind part of head always blackened, moreover colouration and sculpture of body as in *pallida* (thesis 2). Aedeagus as in figs 2800, 2801. Length 4.3–6.0 mm. Eight variations are descri-

bed, the most important aberrations: body entirely pale (typical form), underside reddish brown, elytra with black spots (ab. *rubriventris* KASZAB, 1962), underside black, pronotum entirely pale, elytra with spots (ab. *rufithorax* KASZAB, 1962), body entirely black (ab. *hades* KASZAB, 1962). Distributed in Alps, Sudetes and Carpathians ..... *interposita* (FRANZ et PALMÉN, 1950).

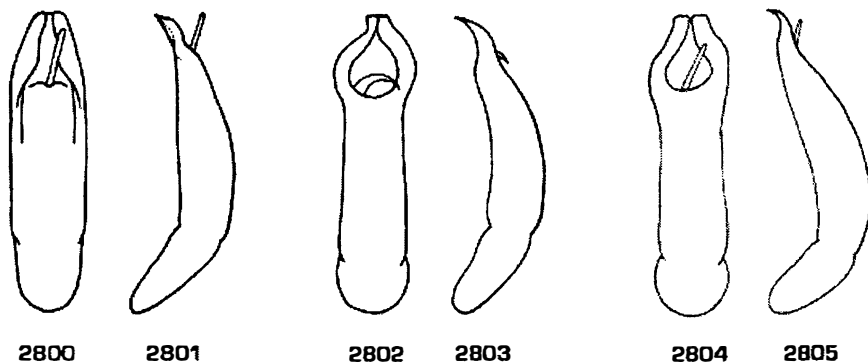


Figs 2794-2799. Aedeagus or its apical half in dorsal and lateral view (2796 after TAKIZAWA 1985; 2798, 2799 after WARCHAŁOWSKI 1994, remaining after MEDVEDEV 1992): 2794, 2795 – *Gonioctena (Gonioctena) arctica*; 2796 – *G. (G.) gracilicornis*; 2797 – *G. (G.) coreana*; 2798, 2799 – *G. (Goniomena) pallida*.

3. In male elytra shining, in female matt. Flagellum curved. Upper side ochraceous or amber, on each elytron two blackish spots (near scutellum and laterally in the middle) and one common spot in the middle of suture. In dark specimens additionally two apical spots on elytra and two spots on pronotum. General view as in plate LXIX, phot. 619. Aedeagus as in figs 2802, 2803. Length 5.0–6.8 mm. About 12 variations are described; the most important aberrations: body uniformly pale (ab. *unicolor* WEISE, 1884), underside and pronotum pale, elytral pattern as in description (typical form), underside blackish, elytra as in typical form, on pronotum two black spots (ab. *sorbi* WEISE, 1884), underside, legs and elytra black, pronotum and scutellum pale (ab. *melanoptera* PENECKE, 1898), body entirely black (ab. *obscura* GRIMMER, 1841). Lives on rowanberry – *Sorbus aucuparia* L. Distributed in northern- central- and southern Europe. Lives mostly on bird prune – *Padus avium* MILL ..... *quinquepunctata* (FABRICIUS, 1787).
- . In male elytra shining, in female matt. Flagellum not bent, protruding obliquely forward. General outline of aedeagus (figs 2804, 2805), external characters and colour variability similar as in *quinquepunctata*. On average a little smaller than *quinquepunctata*. Length 4.5–6.7 mm. Known from Fennoscandia and mountains of Central Europe (Alps, Carpathians ..... *intermerdia* (HELLIESEN, 1913).

Subgenus *Platyphytodecta* BECHYNÉ, 1948

One species only. General view as in plate LXIX, **phot. 620**. Length 6.0–8.0 mm. Variations: elytral pattern as in **phot. 620** (typical form), black spots on elytra free (ab. *quadriplagiata* FAIRMAIRE, 1889), elytra entirely red (ab. *inornata* CHEN, 1934). One subspecies from Kwantung was described: on average larger (7.0–8.6 mm), elytra always uniformly red (subsp. *melli* GRESSIT et KIMOTO, 1961). Species described from N China, but distributed mainly in southern provinces, belonging to Palaetropical area .....  
 ..... *flexuosa* BALY, 1859.



Figs 2800-2805. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1994): 2800, 2801 – *Goniocetena (Goniomena) interposita*; 2802, 2803 – *G. (G.) quinquepunctata*; 2804, 2805 – *G. (G.) intermedia*.

Subgenus *Sinomela* CHEN, 1934

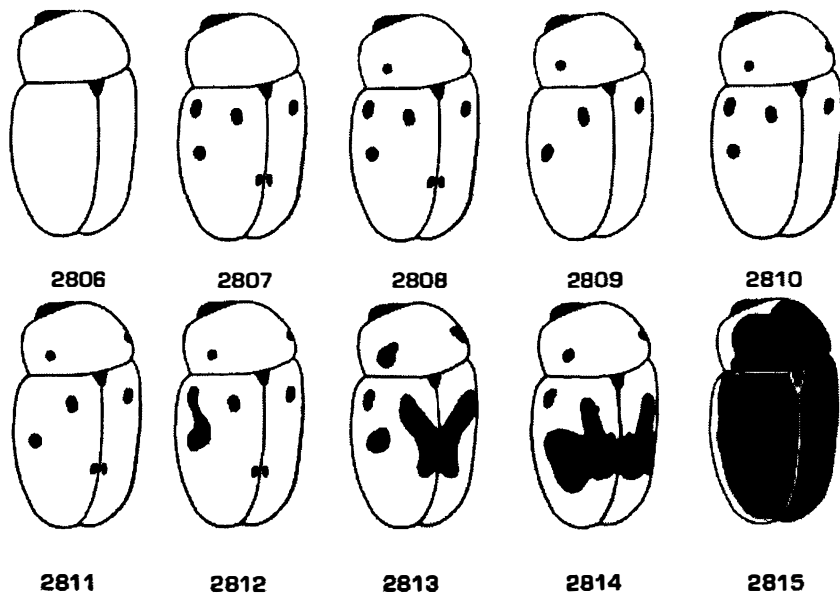
Subgenus *Sinomela* comprises 7 species, distributed in SE Asia; in discussed area three species.

Key to species

1. Body pale reddish brown, elytra green with metallic reflex. Length 5.5–6.5 mm. Described from China, reported also from Korea ..... *aeneipennis* (BALY, 1862).
- . Elytra without metallic reflex .....
2. Upper side pale reddish brown, on pronotum two back roundish spots, on each elytron 5 black spots. Length 5.5–6.0 mm. Distributed in Japan (Kyushu) .....
- . Upper side pale reddish brown, scutellum and 4 spots on each elytron black. Length 5.0–6.0 mm (= *robusta* JACOBY, 1885). Distributed in China and Japan (Honshu) ..... *nigroplagiata* BALY, 1862.

Subgenus *Spartomena* REITTER, 1912

One species only. Upper side brick red with black pattern, underside black, legs bicolorous. General view as in plate, **phot. 621**. Aedeagus as in figs **2816**, **2817**. Length 5.4–7.0 mm (= *akbesiana* FAIRMAIRE, 1884, *rossolus* MARSEUL, 1888). Black pattern of upper side very variable, for the most important aberrations and their names see caption to figs **2806–2815**. Pest of cultivated lucerne (*Medicago sativa* L.). Distributed in basin of Danube, S Poland, Balkan Peninsula, Ukraine, Southern Russia, Caucasian countries and Asia Minor ..... *fornicata* BRÜGGEMANN, 1873.

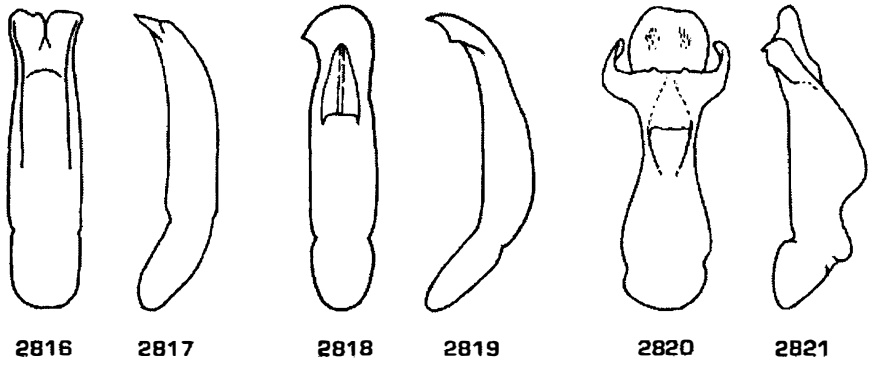


Figs 2806-2815. *Goniocetena (Spartomena) fornicata*, variations (after WARCHAŁOWSKI 1994): 2806 – ab. *septempunctata* BECHYNÉ, 1947; 2807 – ab. *nigriceps* CSIKI, 1953; 2808 – ab. *tetraspilota* BECHYNÉ, 1945; 2809 – ab. *triangularis* BECHYNÉ, 1945; 2810 – ab. *sexpunctata* PANZER, 1796; 2811 – typical form; 2812 – ab. *vittipennis* CSIKI, 1953; 2813 – ab. *conjuncta* ENDRÓDI, 1957; 2814 – ab. *bohumiæ* BECHYNÉ, 1945; 2815 – ab. *picea* WEISE, 1884.

Subgenus *Spartophila* CHEVROLAT, 1837

One species only. Body bicolorous, yellowish grey or greenish grey (dried specimens ochraceous or light brownish) with black pattern. Upper side strongly punctured and distinctly reticulated. Aedeagus as in figs **2817**, **2818**. Length 3.7–5.2 mm (= *weisei* REITTER, 1896, they also exist about 10 further synonyms, described mostly as varieties). Lives on broom (*Sarothamnus scoparius* L., *Genista tinctoria* L., *G. germanica* L.). Distributed in central and western part of Europe (The British Isles, Iberian Peninsula).

la, France, Germany, Poland, northern Italy, Hungaria) and in Morocco. Reported also from Ukraine ..... **olivacea** (FORSTER, 1771).



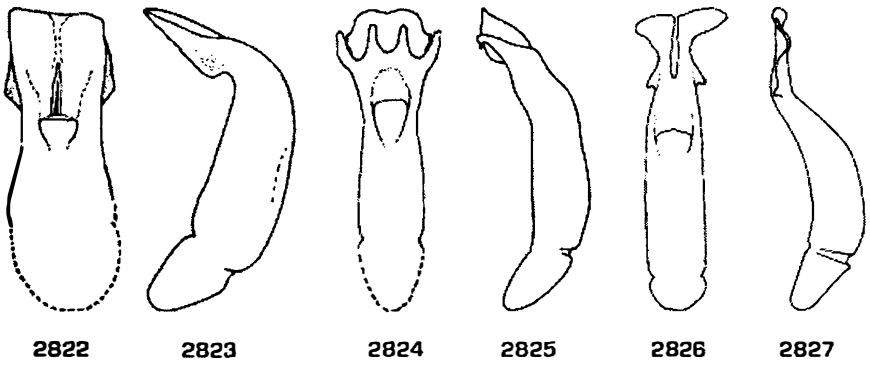
Figs 2816-2821. Aedeagus in dorsal and lateral view (2820, 2821 after KIPPENBERG 2001, remaining after WARCHALOWSKI 1994): 2816, 2817 – *Gonioctena (Spartomena) fornicata*; 2817, 2819 – *G. (Spartophila) olivacea*; 2820, 2821 – *G. (Spartoxena) procax*.

Subgenus **Spartoxena** MOTSCHULSKY, 1860

Literature: KIPPENBERG 2001.

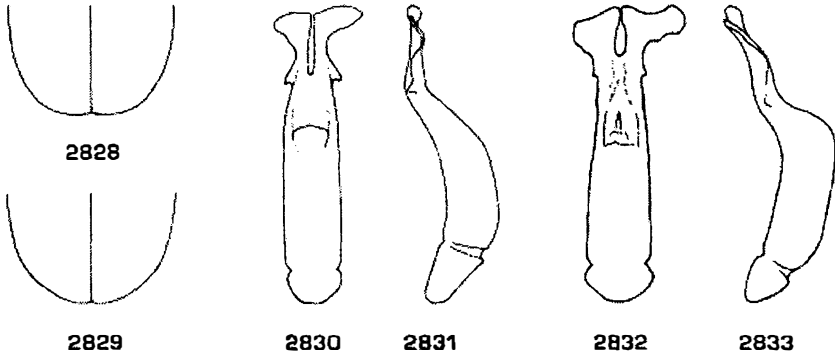
Key to species

- 1. First tarsomere of hind tarsi asymmetrical, particularly in male. General view as in plate LXX, phot. 622. Aedeagus as in figs 2820, 2821. Length 5.0–5.5 mm. Distributed in Algeria ..... **procax** (NORMAND, 1947).
- . First tarsomere of hind tarsi symmetrical ..... **2.**



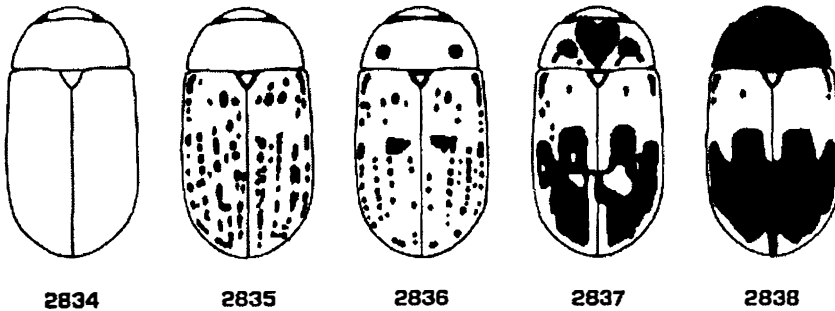
Figs 2822-2827. Aedeagus in dorsal and lateral view (after KIPPENBERG 2001): 2822, 2823 – *Gonioctena (Spartoxena) leprieuri*; 2824, 2825 – *G. (S.) irrorata*; 2826, 2827 – *G. (S.) gobanzi*.

- 2. External tooth of hind tibia in female longer than in remaining species of subgenus, in male forms a long process as in *Machomena lineata*. General view as in plate LXX, phot. 623. Aedeagus as in figs 2822, 2823. Length 5.8–6.6 mm (*marginata* ACHARD, 1924, *rubromarginata* ACHARD, 1924) ..... *leprieuri* (PIC, 1911).
- . External tooth of hind tibia strong, but in both sexes normally formed ..... 3.



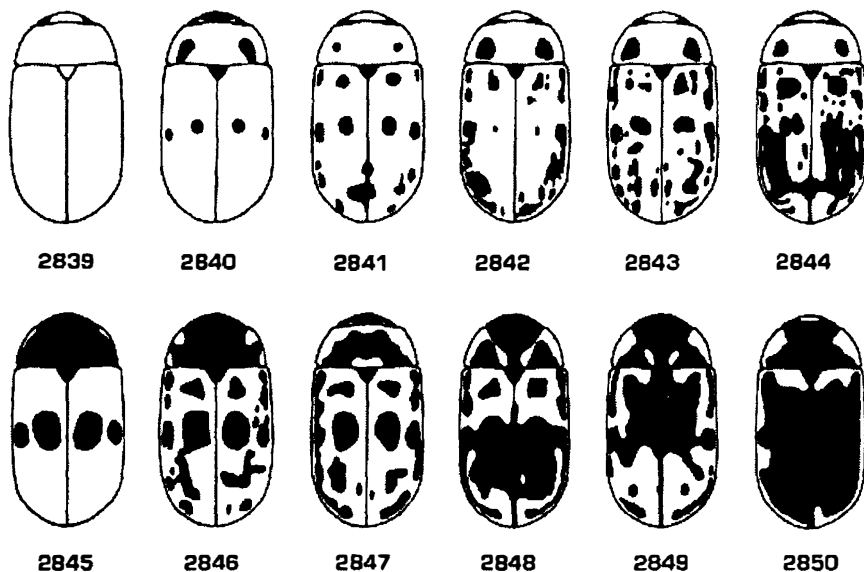
Figs 2828–2833 (after KIPPENBERG 2001): 2828, 2829 – apical part of elytra, remaining – aedeagus in dorsal and lateral view; 2828 – *Gonioctena (Spartoxena) irrorata*; 2829 – *G. (S.) aegrota*; 2830, 2831 – *G. (S.) pseudogobanzi*; 2832, 2833 – *G. (S.) variabilis*.

- 3. Apical margin of elytra broadly rounded. Apex of aedeagus symmetrical (figs 2824, 2825). Length 5.5–7.0 mm (= *pellax* NORMAND, 1947, *atlasica* KOCHER, 1953, *levasseuri* CANTONNET, 1968). Forms two subspecies. Apex of aedeagus as in fig. 2824 (nominotypical subspecies), central process a little shorter, lateral process longer (subsp. *lateralis* KOCHER, 1953 from Middle Atlas). Distributed in NW Africa from Morocco to Tunisia ..... *irrorata* (WEISE, 1891).
- . Apical margin of elytra not broadly rounded. Apex of aedeagus asymmetrical ..... 4.
- 4. On apex of aedeagus right lamella directed obliquely forward ..... 5.
- . On apex of aedeagus right lamella directed transversely. W Mediterranean species ..... 7.



Figs 2834–2838 (after KIPPENBERG 2001). *Gonioctena (Spartoxena) gobanzi*, variations (unnamed).

5. Central European species. Antennae relatively short, in female as long as anterior margin of pronotum. General view as in plate LXX, **phot. 625**. Aedeagus as in figs **2826**, **2827**. Length 6.5–8.5 mm. Variations as in figs **1763–1767**. Distributed in Alps, another reports (from Carpathians) surely erroneous ..... *gobanzi* (REITTER, 1902).
- . W Mediterranean species ..... **6**.

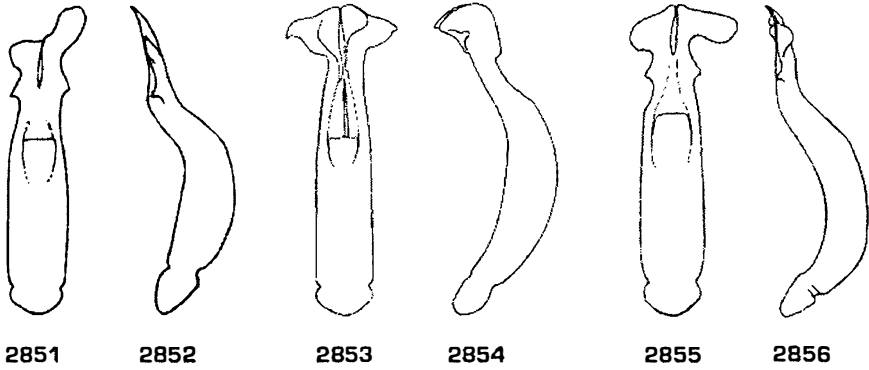


Figs 2839-2850 (after KIPPENBERG, 2001). *Gonioctena (Spartoxena) variabilis*, variations (unnamed).

6. Species from S Spain. Antennae longer, in female usually longer than anterior margin of pronotum. Aedeagus as in figs **2830**, **2831**. Length 6.0–8.0 mm. Distributed in SE Spain (Alpujarra) ..... *pseudogobanzi* KIPPENBERG, 2001.
- . On apex of aedeagus right lamella directed strongly forward. Aedeagus as in figs **2832**, **2833**. Length 5.5–7.2 mm (= *unipunctata* OLIVIER, 1790, *spartii* OLIVIER, 1807 *grandini* DESBROCHERS, 1870, *navasi* FUENTE, 1901, *binotaticeps* PIC, 1911, *luteonotata* PIC, 1912, *leseleuci* NORMAND, 1947). Lives on *Genista scorpius* DE CAND. Distributed in S France alike in M and NE Spain ..... *variabilis* (OLIVIER, 1790).
7. Length of body 7.5–9.5 mm. Both lamellae on apex of aedeagus sharpened or at least angular. General view as in plate LXX, **phot. 626**. Variations as in figs **1786–1789** (= *bilunata* ACHARD, 1924). Distributed in Morocco and Algeria ..... *secsaouia* (KOCHER, 1953).
- . Length of body under 8.0 mm. Both lamellae on apex of aedeagus rounded. General view as in plate LXX, **phot. 624**. Aedeagus as in figs **2829**, **2830** (= *icterica* WEISE, 1891, *koltzei* WEISE, 1891, *nubila* FUENTE, 1910, *marginata* FUENTE, 1920, *rubra* ZULUETA, 1925). Forms 3 subspecies: larger, length 6.0–8.0 mm (*aegrota* s. str. nomenclotypal subspecies distributed in M and S Spain); smaller, length 5.5–6.5 mm, in



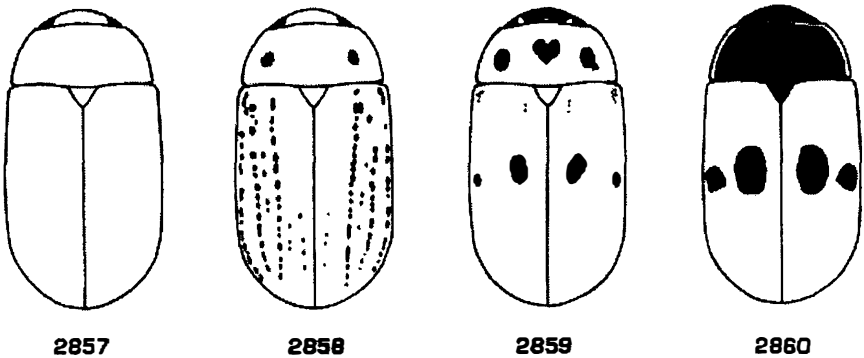
female ground of elytra matt (subsp. *litoralis* KIPPENBERG, 2001, from SW Spain), small, length 3.5–6.0 mm, ground of elytra in both sexes shining (subsp. *nana* KIPPENBERG, 2001, from Alpujarra) ..... ***aegrota*** (FABRICIUS, 1798).



Figs 2851-2856. Aedeagus in dorsal and lateral view (after KIPPENBERG 2001): 2851, 2852 – *Goniocтена (Spartoxena) variabilis*; 2853, 2854 – *G. (S.) secsaouia*; 2855, 2856 – *G. (S.) aegrota*.

Genus ***Humba*** CHEN, 1934

A small genus, comprising two species, belonging to Oriental fauna. Body large, blackish violaceous or deep blue, except for elytra and abdomen being dark yellow or pale orange. Punctuation of pronotum and elytra fine and shallow, not very densely scattered, uniform, on elytra here and there arranged in longitudinal rows. General view as in plate LXX, phot. 627. Length 12.0–14.5 mm (= *dauidis* FAIRMAIRE, 1878, *tonkinensis* WEISE, 1902). Distributed In Sikkim, Assam, S China and N Indochina, in discussed area known from S Kansu only ..... ***cyanicollis*** (HOPE, 1831).



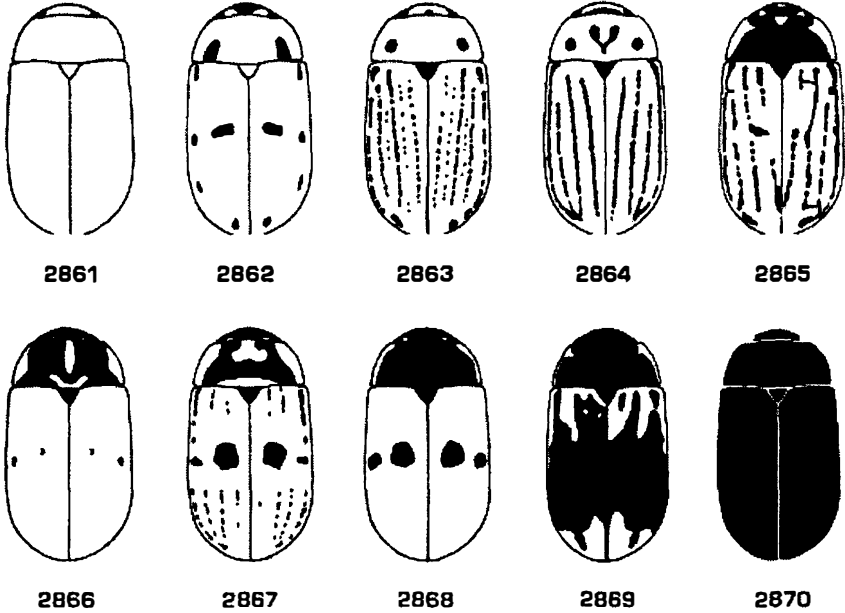
Figs 2857-2860 (after KIPPENBERG 2001). *Goniocтена (Spartoxena) secsaouia*, variations (unnamed).

Genus *Hydrothassa* THOMSON, 1866

285.

Key to subgenera

1. Transverse hollow on mesosternum shallow, without marginal ridge. Marginal ridge on anterior margin of first abdominal sternite absent or well-developed ..... *Hydrothassa*.
- . Transverse hollow on mesosternum deep, margined by a elevated marginal ridge. Marginal ridge on anterior margin of first abdominal sternite absent or very feebly developed ..... *Agrostithassa*.



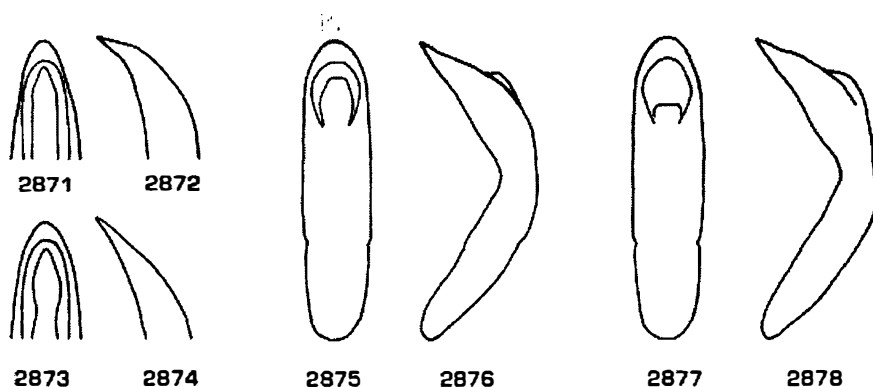
Figs 2861-2870 (after KIPPENBERG 2001). *Gonioctena (Spartoxena) aegrota*, variations (unnamed).

Subgenera *Hydrothassa* s. str. and *Agrostithassa* JACOBSON, 1921

Key to species (of both subgenera)

1. Pronotum with orange lateral margins ..... 2.
- . Pronotum uniformly greenish- or bluish-black ..... 3.
2. On elytron two orange longitudinal stripes: lateral and (often shortened) median stripe. Pronotum broader and shorter. General view as in plate LXX, **phot. 628**. Aedeagus as in figs **2875**, **2876**. Length 3.8–5.0 mm (= *ranunculi* HERBST, 1783). Variations: median stripe entire (typical form), median stripe one or two times interrupted, but not shortened (ab. *potentillae* HERBST, 1784), median stripe shortened, sometimes also interrupted (ab. *calthae* WEISE, 1883), median stripe absent

- (ab. *germanica* WEISE, 1883), body smaller, elytra particularly strongly and unevenly punctured (ab. *degenerata* MÄKLIN, 1881). On marsh marigold (*Caltha palustris* L.). Distributed in northern, northwestern and central part of Europe ..... (H.) ***hannoveriana*** (FABRICIUS, 1775).
- . On elytron lateral stripe only. Pronotum narrower and longer. General view as in plate LXX, **phot. 629**. Aedeagus as in figs **2877**, **2878**. Length 3.0–5.0 mm. Variations: metallic reflex on elytra bronzy (typical form), metallic reflex on elytra bluish or greenish (unnamed), orange pattern darkened, brown or pitchy black (ab. *devillei* BULLOCK, 1928). On *Ranunculaceae* (*Ranunculus*, *Caltha*). In NE Asia occurs subspecies *eoia* LOPATIN, 1962, differing by darker (red) colouration of elytral and pronotal borders and by form of aedeagus, narrowed before apical part. Probably a transpalaeartic species, known from all central and north parts of Europe and from E Siberia to Ussuria ..... (H.) ***marginella*** (LINNAEUS, 1758).
3. Elytra with orange lateral stripe ..... **4**.
- . Elytra uniformly blue black or greenish black ..... **6**.
4. Epipleura sometimes sparsely and unevenly, but distinctly punctured ..... **5**.
- . Epipleura not punctured. Aedeagus as in figs **2873**, **2874**. Length 3.4–4.4 mm. Distributed in Balkans, central part of basin of Danube, Apulia and Asia Minor ... (A.) ***flavocincta*** (BRULLÉ, 1832).
5. Aedeagus apically slightly narrowed (figs **2871**, **2872**). Sides of elytra slightly rounded. Length 3.2–4.4 mm. Variations: epipleura and two external intervals of elytra pitchy black or black (typical form), epipleura and two external intervals of elytra orange or red (ab. *aucta* FABRICIUS, 1787), punctures on pronotum very fine, in the middle almost disappearing (ab. *hispanica* GRAËLLS, 1851). On *Ranunculaceae* (*Ranunculus*, *Caltha*). Distributed in almost whole Europe, Morocco and Western Siberia ..... (A.) ***glabra*** (HERBST, 1783).
- . Aedeagus apically rather broadly rounded. Sides of elytra almost parallel. Distributed in Algeria and Tunisia ..... (A.) ***oblongiuscula*** FAIRMAIRE, 1884.



Figs 2871–2878. Aedeagus or its apical part in dorsal and lateral view (after WARCHAŁOWSKI 1994): 2871, 2872 – *Hydrothassa glabra*; 2873, 2874 – *H. flavocincta*; 2875, 2876 – *H. hannoveriana*; 2877, 2878 – *H. marginella*.

6. Humeral callus very narrow, often crest-like, strongly elevated, on the outer side limited by very deep 8. row of punctures. Body uniformly black with bluish reflex. Length 4.0–4.8 mm (= *planiuscula* WEISE, 1887, *burakowskii* WARCHAŁOWSKI, 1995). Distributed in Iberian Peninsula and in Pyrenees ..... (H.) *fairmairei* (BRISOUT, 1866).
- . Humeral callus and 8. row of punctures normal ..... 7.
7. Lateral sides of pronotum in posterior part almost straight. Epipleura sparsely and unevenly punctate. Typical form of H. (A.) *glabra* (see thesis 5).
- . Lateral sides of pronotum more rounded. Epipleura densely and rather finely punctate. Length 3.0–4.1 mm (= *pumila* REICHE, 1862). Upper side uniformly blue black. Endemic to Sardinia and Corsica ..... (A.) *suffriani* (KÜSTER, 1852).

Genus *Leptinotarsa* CHEVROLAT, 1837

In discussed area one species only. Upper side yellowish with black pattern. On pronotum several black spots, on each elytron 5 longitudinal black stripes. General view as in plate LXX, **phot. 630**. Length 7.0–11.0 mm. Known pest of potato cultures. Introduced from America, distributed in almost whole Europe ..... *decemlineata* (SAY, 1824).

Genus *Linaeidea* MOTSCHULSKY, 1860

The genus *Linaeidea* MOTSCHULSKY includes six species distributed in Palaearctic area and in SE Asia; of these two occur in the discussed area.

Key to species

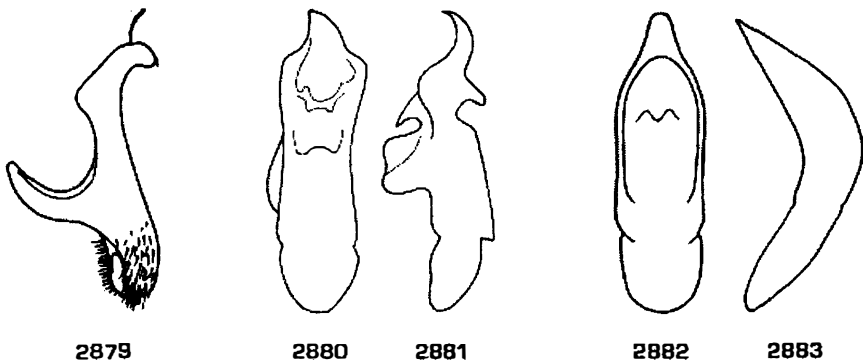
1. Pronotum without median longitudinal furrow ..... 2.
- . Pronotum with fine, linear, longitudinal furrow ..... 3.
2. Upper side entirely metallic green, blue or cupreous. Metallic sheen of upper side always distinct, in golden and green aberrations usually very strong, in blue and violaceous rather feeble. Apex of abdomen and six basal antennomeres yellowish-red, tibiae apically and knees sometimes reddish. On pronotum fine median longitudinal furrow not always distinct. Humeral calli very convex, elongate and shining. General view as in plate LXXI, **phot. 631**. Length 6.2–7.6 mm (= *betulae* SCOPOLI, 1763, *coeruleoviolacea* DEGEER, 1775, *haemorrhoidalis* MÜLLER, 1776, *fuscicornis* FABRICIUS, 1781, *ametysthica* GMELIN, 1790, *violacea* OLIVIER, 1790). Variations: metallic gloss of upper side green, vivid (typical form), metallic gloss of upper side golden-cupreous, vivid (ab. *vitellinae* SCOPOLI, 1763), metallic gloss of upper side blue, vivid (unnamed), upper side black, metallic sheen not very strong, green or olive (unnamed), pronotum green, elytra blue (unnamed), pronotum blue, elytra green (ab. *bicolor* SCHILSKY, 1908), pronotum and anterior third of elytra green, remaining part of elytra cupreous (ab. *discolor* GERHARDT, 1910). Two subspecies were described: legs reddish (subsp. *tsutsui* NAKANE, 1955 described from Honshu, but occurring sympatrically together with *aenea* s. str., perhaps a local variation only). Other subspecies see thesis 3. Transpalaearctic species, distributed from Ireland to Japan ..... *aenea* (LINNAEUS, 1758).

- Pronotum orange, reddish or reddish-brown, sometimes with black-green markings ..... 3.
- 3. Pronotum narrower, its lateral margins subparallel. General view as in plate LXXI, **phot. 632**. Remaining characters as in *aenea* s. str. Distributed in Japan ...  
..... *aenea* subsp. *insularis* CHŪJŌ, 1940.
- Pronotum broad, body more stout. Head usually red. Primary punctures on elytra arranged in semiregular rows at least near suture. Body yellowish or reddish testaceous, elytra metallic green with aeneous reflex, apical half of antennae black. General view as in plate LXXI, **phot. 633**. Length 8.0–10.5 mm. Distributed in N and W China ..... *aeneipennis* (BALY, 1859).
- 4. Pronotum uniformly reddish, head usually metallic green or black with greenish reflex. Legs dark reddish, uniformly coloured. General view as in plate LXXI, **phot. 634**. Length 6.9–8.3 mm. Described from Japan (Shikoku, Kyushu). Forms also unnamed variations differing in colouration of legs: piceous, dark red brown or orange ..... *adamsi* (BALY, 1884).
- Pronotum reddish with large central spot and two small spots blackish on each side. Remaining external characters as in *adamsi* (thesis 4) (= *placida* CHEN, 1934, *ornaticollis* CHEN, 1936), sometimes central spot disappear (ab. *praecox* BECHYNÉ, 1954). Possibly a distinct species .....  
..... *adamsi* subsp. *emmerichi* (PIC, 1934).

Genus *Machomena* DUBOIS, 1887

*Acanthodon* WEISE, 1880 nec GUÉRIN 1839

Often ranked as a subgenus of *Gonioctena*. One species only. Body yellowish orange. Pronotum with 2 or 4 black spots, punctures of elytra arranged in 9 geminate rows, intervals 2, 4, 6 and 8 entirely or partly black. General view as in plate LXXI, **phot. 635**. In male on hind tibia a great, curved tooth (fig. 2879). Aedeagus very asymmetrical. Length 6.0–7.0 mm. Endemic to Corsica and Sardinia ..... *lineata* (GENÉ, 1839).



Figs 2879–2883. Hind tibia in male, aedeagus in dorsal and lateral view (2880, 2881 orig., remaining after WARCHAŁOWSKI 1994): 2879–2881 – *Machomena lineata*; 2882, 2883 – *Neophaedon pyritosus*.

Genus *Neophaedon* JACOBSON, 1901

The genus *Neophaedon* contains 3 Westpalaearctic species.

Key to species

1. Upper side black with weak bronzy reflex. Legs dark brown. Body roundish, stout, convex ..... **2.**
- . Upper side greenish-blue, pronotum with feeble bronzy reflex. Legs yellow orange with slightly darkened joints. Body more slender, less convex, suboval. Aedeagus approximately as in *pyritosus* (thesis 2). General view as in plate LXXI, **phot. 636**. Length 2.8–3.0 mm. Endemic to Creta ..... **poneli** BERGEAL, 2001.
2. Species from Europe and Asia. Body black with bronzy reflex, antennae and legs brown, in immature specimens apex of elytra, epipleura, sometimes also scutellum shining trough reddish. Aedeagus as in figs **2882, 2883**. Length 3.2–3.8 mm (= *graminis* PANZER, 1799, *graminicola* DRAPIEZ, 1819). Variations: upper side bronzy black (typical form), upper side greenish black (unnamed), upper side blue black (ab. *coerulescens* WEISE, 1900). In Central Asia forms a subspecies *alutaceus* FLEISCHER, 1909, with upper side rather matt, finely rugose. Distributed in Central and south-eastern Europe, Asia Minor, Caucasian countries and Central Asia ..... **pyritosus** (ROSSI, 1792).
- . Species from North Africa. External characters as in *pyritosus* (thesis 1), but aedeagus formed somewhat differently. Length 3.2–3.8 mm. Described from Morocco ... **pseudopyritosus** CODINA, 1963.

Genus *Oreina* CHEVROLAT, 1837

Literature: KÜHNELT 1984.

The genus *Oreina*, often considered as a subgenus of *Chrysolina*, comprises 22 species distributed mainly in European mountains, two species from Altai are also described. Numerous nominal taxa within the genus were variously interpreted and synonymized in various combinations during the last 150 years. The assignment of varieties and species adopted here follows mainly KÜHNELT (1984), but a considerable part of the cited names still awaits revision.

Key to subgenera

1. Last maxillar palpomere at least as thick as the penultimate ..... **2.**
- . Last maxillar palpomere distinctly narrower than the penultimate. Basal antennomere with metallic sheen ..... **6.**
2. Elytral epipleura broad, reaching to end of 3. abdominal sternite. Elytra unicolorous with convex (at least in the middle) external interval. Thickened lateral border of pronotum clearly limited and elevate ..... **Allorina** (p. 573).
- . Elytral epipleura narrower, not reaching to end of 3. abdominal sternite. External interval of elytra flat. Thickened lateral border of pronotum more feebly elevate ..... **3.**

3. Last maxillar palpomere very broad, often almost axwe-shaped. Two basal antennomeres on underside usually reddish ..... **4.**
- Last maxillar palpomere not particularly broad. Basal antennomeres entirely dark ..... **5.**
4. Prosternal process flattened, thickened lateral border of pronotum broad and flat. Lateral furrow of pronotum on whole length distinct. Elytra without differently coloured longitudinal stripe ..... ***Intricatorina*** (p. 577).
- Prosternal process with longitudinal furrow. Lateral furrow of pronotum anteriorly shallow, in hind part deeper, in the middle interrupted ..... ***Oreina*** s. str. (p. 577).
5. Upper side with metallic sheen ..... ***Virgulatorina*** (p. 582).
- Upper side without metallic sheen, black, red or red with black pattern ..... ***Protorina*** (p. 580).
6. Antennomeres 5 and 6 short, only slightly longer than broad. Elytra unicolorous ... ***Frigidorina*** (p. 576).
- Antennomeres 5 and 6 longer, at least 1.5 × longer than broad ..... ***Chrysochloa*** (p. 574).

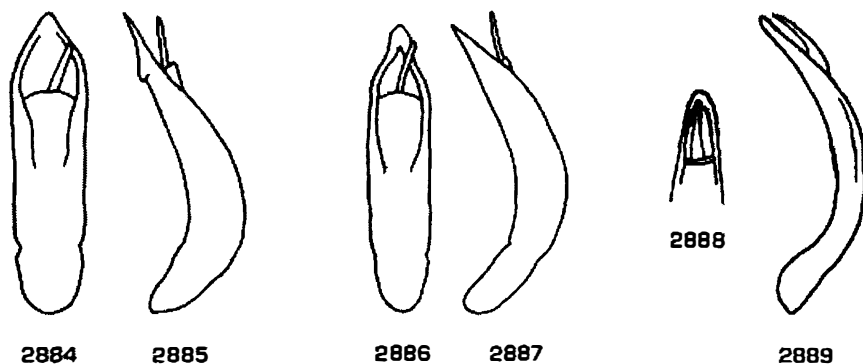
Subgenus ***Allorina*** WEISE, 1902

Key to species

1. Length of aedeagus 3.50–3.85 mm (on average 3.61 mm). On the underside of apical part two backwards bent teeth or lamellae. Upper side unicolorous. Aedeagus as in figs **2884**, **2885**. Length 9.0–13.0 mm (= *tristis* FABRICIUS, 1792 sensu WEISE, 1884). Forms 3 subspecies: darker, rather feebly shining, stronger punctate (nominotypical subspecies from Alps and Appenines), lighter blue and smaller (to 10.0 mm) (subsp. *collucens* DANIEL, 1903 from Alpes Maritimes, perhaps belonging to *coerulea*, antithesis 1) and larger (over 10.0 mm), relatively dark and more smooth (subsp. *tenebrosa* WEISE, 1884 from Pyrenees). Distributed in mentioned areas only, reports from other countries concern usually *coerulea* ..... ***bidentata*** BONTEMS, 1981.
- Length of aedeagus 2.75–3.25 mm (on average 2.98 mm). On the underside of apical part no teeth or lamellae. Elytra unicolorous, almost always coloured similar to pronotum. Aedeagus as in figs **2886**, **2887**. Length 9.0–10.5 mm. Variations: upper side deep dark blue (typical form), upper side black, almost matt (ab. *nigritula* WEISE, 1894), upper side green or bronzy-green (ab. *gaertneri* WEISE, 1894), pronotum violaceous, elytra dark blue (unnamed), pronotum green, elytra blue (unnamed). Four subspecies were described. Nominotypical subspecies inhabiting Carpathians and European lowland (N France, N Germany, Denmark, N Poland, Karelia, Central and NE Russia), subsp. *marxzellana* BECHYNÉ, 1958 from Schwarzwald and Vosges, subsp. *nobilis* WALTIL, 1839 from southern Germany, E Alps, Böhmerwald, Erzgebirge and Sudetes, subsp. *serbica* from Dinaric Alps and Bulgaria. A few further subspecies were described on the basis of body outline, sculpture and coloration, but at least a part of them probably belong elsewhere ..... ***coerulea*** (OLVIER, 1790).

Key to species

1. Siberian species. Hind wings shortened, humeral callus feebly developed. Elytra densely transversely rugose. Upper side green with aeneous or cupreous reflex, rarer blue. Aedeagus in general outline similar as in *speciosissima* (antithesis 5). Length 6.6–7.2 mm (male) to 7.3–7.8 mm (female). Distributed in mountains Sayan and the neighbouring area ..... ***redikorzevi*** (JACOBSON, 1925).
- . European species. Hind wings never shortened, humeral callus well-developed ... 2.



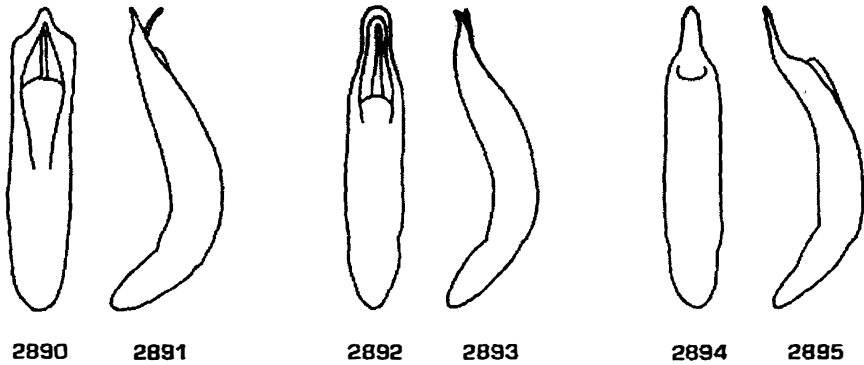
Figs 2884-2889. Aedeagus in dorsal and lateral view (after WARCHALOWSKI, 1993): 2884-2885 – *Oreina* (*Allorina*) *bidentata*; 2886, 2887 – *O. (A.) coerulea*; 2888, 2889 – *O. (Chrysochloa) splendidula*.

2. Pronotum without distinct lateral thickenings. Along the lateral margin of elytra run a longitudinal thickening, limited by a furrow with two rather confuse rows of punctures. Aedeagus as in figs **2888**, **2889**. Length 6.0–9.0 mm (= *fairmairiana* GOZIS, 1882). Variations: upper side blue or violaceous (typical form) or almost black to pure black (ab. *fairmairei* WEISE, 1893). Distributed in Pyrenees, reported also from Asturian mountains ..... ***splendidula*** (FAIRMAIRE, 1865).
- . Pronotum with distinct lateral thickenings. Lateral sides of elytra normal ..... 3.
3. Anterior margin of elytra with a rather irregular, impunctate thickening. Length 6.5–8.2 mm (= *elegans* ARAGONA, 1830, nec OLIVIER, 1807). Upper side green or bluish green with golden-bronzy to golden-red longitudinal stripe or blue with green stripe. Aedeagus as in figs **2890**, **2891**. Variation: upper side almost black (ab. *carbonaria* BINAGHI, 1973). Distributed in Appenines and Alpes Maritimes, reported also, probably erroneously, from Pyrenees ..... ***genei*** (SUFFRIAN, 1851).
- . Anterior margin of elytra without thickening ..... 4.
4. Elytra strongly and densely punctured, without longitudinal stripe, matt, secondary Puncturation distinct. Upper side always unicolorous. Length 6.5–7.0 mm. Forms 5 subspecies inhabiting rather small, separate areas: aedeagus apically only feebly narrowed (figs **2892**, **2893**) (subsp. *siparii* LUIGIONI, 1931 from Appenines), lateral



thickenings of pronotum elevate (nominotypical subspecies from Lessinisch Alps), antennomeres 3–11 widened, pronotum almost trapezoidal (subsp. *styriaca* Franz, 1949 from Austria), antennae normal, upper side stronger shining (subsp. *ruffoi* FRANZ, 1949 from Switzerland and Piemonte), antennae normal, upper side feebly shining (subsp. *occidentalis* RUFFO, 1946 from W Alps). Distributed in mentioned areas .....

- . Elytra finely punctate, usually with longitudinal stripe ..... **5.**



Figs 2890-2895. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI, 1993): 2890, 2891 – *Oreina (Chrysochloa) genei*; 2892, 2893 – *O. (C.) elongata*; 2894, 2895 – *O. (C.) splendidula*.

5. Body slender, lateral sides almost parallel. Lateral thickenings of pronotum at least partly strongly punctured. Each elytron often with two (sutural and lateral), matt longitudinal stripe. Very variable, names of varieties sometimes correspond with names of subspecies. Ground colour of upper side usually dark blue, more rarely bluish-green, green or bronzy-green. General view as in plate LXXI, **phot. 639**. Length 7.5–11.0 mm. Variations: upper side green, shining, elytral stripes matt, dark blue or violaceous (typical form), ground blue, stripes black violaceous (ab. *coeruleolineata* DUFTSCHMID, 1825); elytra (usually except anterior margin and humeral calli) matt, deep dark blue or dark violaceous (ab. *sumptuosa* REDTENBACHER, 1849); upper side unicolorous, violaceous-purplish (ab. *cyanipennis* WEISE, 1883); olive-black (ab. *tristicula* WEISE, 1883) or bronzy-green, shining (ab. *fraudulenta* WEISE, 1883). Forms 12 subspecies, not always well-distinguishable. Nominotypical subspecies (in which predominates ab. *coeruleolineata*) inhabits N Alps; typical form predominate, but here occurs also more vivid coloured specimens with bronzy stripes (subsp. *bohémica* WEISE, 1889); as *bohémica*, but larger (to 11.0 mm) and more convex (subsp. *feldbergensis* BECHYNĚ, 1958 from Schwarzwald); antennae thinner as normally, shining, dark bluish violaceous forms predominate (subsp. *tussilaginis* SUFFRIAN, 1851 from Central Pyrenees); length of body 8.0–9.0 mm, shining, unicolorous, black-blue or blue-violaceous forms predominate (subsp. *senecionis* SCHUMMEL, 1844 from Sudetes and Carpathians); outline of body more stout, green with blue stripes, shining forms predominate (subsp. *dinarica* APFELBECK, 1912 from Balkan

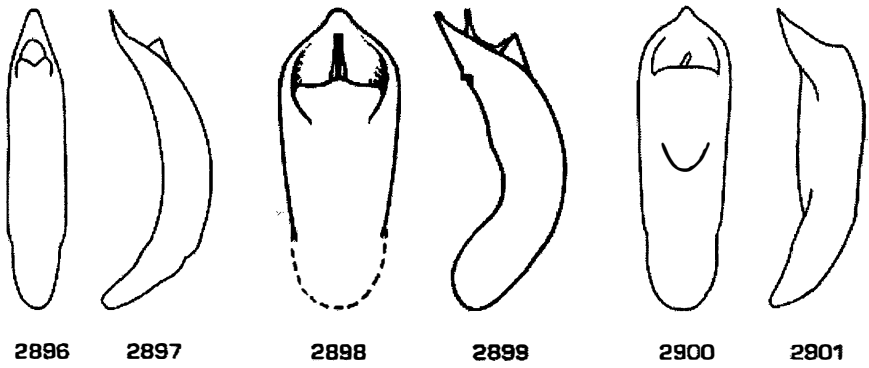
Peninsula); as *dinarica*, but blue and dark violaceous forms predominate (subsp. *albatica* MÜLLER, 1948 from N Albania); body slender, elytra even in female not broader than pronotum; typical form predominate (subsp. *macera* WEISE, 1884 from Julic Alps and Karawanken); apex of aedeagus less narrowed; shining, unicolorous, green or bronzy-green forms predominate (subsp. *barii* SCHATZMAYR, 1943 from Liguria); aedeagus as in *barii*, elytra in anterior part shining, besides matt (subsp. *magistrettii* SCHATZMAYR, 1941 from Appenines); upper side covered by fine rugosities (subsp. *senilis* DANIEL, 1903 from Alpes Maritimes); elytra entirely matt, ab. *sumptuosa* predominate (subsp. *sumptuosa* REDTENBACHER, 1849 from W Alps). Distributed in mentioned areas ..... ***cacaliae*** (SCHRANK, 1785).

- Body shorter, more oval, elytra widened posteriad. Lateral thickenings of pronotum almost smooth. Each eytron mostly with a shining longitudinal stripe. Aedeagus as in figs 2896, 2897. Length 6.5–9.5 mm. Very variable, about 40 forms were described, similarly as in *cacaliae* (thesis 4) names of varieties sometimes correspond with names of subspecies. Variations: upper side unicolorous, dark blue (typical form), almost black (ab. *nigrescens* LETZNER, 1853), dark green sometimes with bronzy reflex (ab. *viridescens* SUFFRIAN, 1851), upper side dark violaceous, on each elytron longitudinal, black stripe (ab. *violacea* LETZNER, 1953), upper side bluish green, stripes black violaceous (ab. *schummeli* WEISE, 1883), ground colour of upper side golden-green, golden or fiery red, stripes green or blue (subsp. *letzneri* WEISE, 1883). 12 subspecies were described. In nominotypical subspecies inhabiting the most part of Alps predominate ab. *viridescens*, *violacea*, *schummeli* and the typical form. Body more slender and flattened, ab. *violacea* predominate (subsp. *troglydites* KIESENWETTER, 1861, a alpine form from E Alps); as *troglydites*, typical form predominate (subsp. *binaghii* DACCORDI et RUFFO, 1976 from Italian part of Alpes Maritimes); as *troglydites*, upper side strongly shining, ab. *viridescens* predominate (subsp. *solarii* DACCORDI et RUFFO, 1976 from Toscana), as *troglydites*, typical form predominate (subsp. *crocetta* BECHYNÉ, 1958 from Alpi Graje), as *solarii* upper side matt (subsp. *priela* BECHYNÉ, 1958 from Asturia), sides of pronotum almost straight, dark unicolorous predominate (subsp. *convergens* SUFFRIAN, 1851 from Pyrenees), sexual dimorphism particularly strong, male considerably smaller and stronger punctate than female (subsp. *bisculpta* BECHYNÉ, 1958 from Schwarzwald), length 6.0–7.0 mm; puncturation of upper side strong, ab. *nigrescens* and *viridescens* predominate (subsp. *natarsia* BECHYNÉ, 1958 from Steiermark), very small, length about 6.0 mm, body slender (subsp. *phyrgassia* BECHYNÉ, 1958 from N Steiermark), very variously coloured forms, similar by body outline (subsp. *fuscoaenea* SCHUMMEL, 1843 inhabiting S Germany, Böhmerwald, Erzgebirge, Sudetes and Carpathians), body smaller, slender, humeral calli more protruding, ab. *violacea* and ab. *viridescens* predominate (subsp. *juncorum* SUFFRIAN, 1851 from S Carpathians and Balkan Peninsula). Distributed in mentioned areas ..... ***speciosissima*** (SCOPOLI, 1763).

Subgenus ***Frigidorina*** KÜHNELT, 1984

One species only. The smallest species of genus *Oreina*, body length always under 6.5 mm. Upper side black with greenish, bluish, bronzy or cupreous metallish sheen,

more rarely pure black. General appearance as in *speciosissima* (subg. *Chrysochloa*, antithesis 4), but ground of elytra not or only indistinct reticulate. Aedeagus as in figs **2898**, **2899**. Length 5.0–6.5 mm. Alpin, distributed from Savoy to Bavarian Alps .....  
 ..... *frigida* (WEISE, 1883).



Figs 2896-2901. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI, 1993): 2896 – 2897 – *Oreina (Chrysochloa) speciosissima*; 2898, 2899 – *O. (Frigidorina) frigida*; 2900, 2901 – *O. (Intricatorina) intricata*.

Subgenus *Intricatorina* KÜHNELT, 1984

One species only. Upper side rugose. Aedeagus as in figs **2900**, **2901**. Length 8.5–11.0 mm. Variations: upper side black blue (typical form), green or bluish green (unnamed), violaceous or purplish (ab. *amethystina* WEISE, 1883), black or almost black (ab. *seminigra* WEISE, 1883). Forms two subspecies: rugosities of upper side more strongly developed, colouration usually dark, black or black blue (nominotypical subspecies inhabiting Sudetes and Carpathians from Tatra to Rodna), rugosities of upper sideshallower, usually green or bluish (subsp. *anderschi* DUFTSCHMIDT, 1825 from remaining part of area). Distributed in Sudetes, Alps, Carpathians and in mountains of Balkan Peninsula .....  
 ..... *intricata* (GERMAR, 1824).

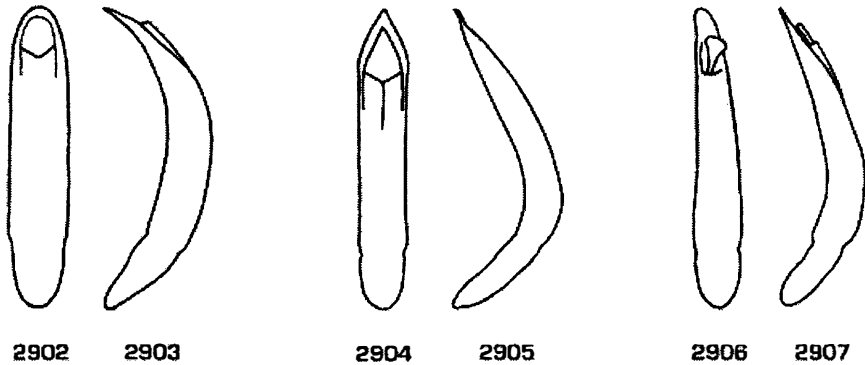
Subgenus *Oreina* s. str.

Key to species

- 1. European species ..... **2.**
- . Siberian species. General view as in plate LXXI, **phot. 637**. Upper side in male shining, in female matt, unicolorous, usually dark green. Length 7.0–9.0 mm. Variations: upper side green (typical form = ab. *virens* JACOBSON, 1901), golden-green (ab. *aureoviridis* JACOBSON, 1901), golden red (unnamed), cupreous (ab. *cuprescens* JACOBSON, 1901), blue (ab. *coerulea* HÄNEL, 1938), black blue (ab. *nigrocoerulea* JACOBSON, 1901),

JACOBSON, 1901) or violaceous (ab. *violacea* HÄNEL, 1938). Forms one subspecies: in female elytra with shallow, longitudinal furrows, upper side often bicolorous (head and pronotum green, elytra cupreous) (subsp. *sulcata* GEBLER, 1823). Distributed mainly in Altai and Sayan range and in southern part of basin of Yenisey. Subspecies distributed from Tuva to (?) Transbaicalia ..... ***basilea*** (GEBLER, 1823).

2. Lateral impressions on pronotum very shallow, lateral thickenings rather indistinct. Apex of aedeagus (figs 2902, 2903) evenly rounded. Length 8.0–10.5 mm. Variations: upper side uniformly dark green, sometimes with feeble bronzy or bluish reflex (typical form), upper side uniformly purplish, cupreous or golden-cupreous (ab. *ignita* COMOLLI, 1837), upper side blue, sides of pronotum sometimes greenish (ab. *heeri* SUFFRIAN, 1851), upper side black blue or pure black, sides of elytra and epipleura or epipleura only golden-green (ab. *lugubris* WEISE, 1883), upper side green or bronzy-green, on each elytron a very broad, longitudinal black stripe with bluish-green margins (ab. *mirifica* WEISE, 1883). Forms two subspecies: body outline more stout, pronotum rather feebly narrowed anteriorly (nominotypical subspecies, distributed in Alps, Vosges and Alps), body more slender, pronotum stronger narrowed anteriorly (subsp. *merkli* WEISE, 1884. distributed in Carpathians). Distributed in mentioned areas ..... ***viridis*** (DUFTSCHMID, 1825).
- . Lateral impressions and lateral thickenings at least in hind part well-developed ... 3.



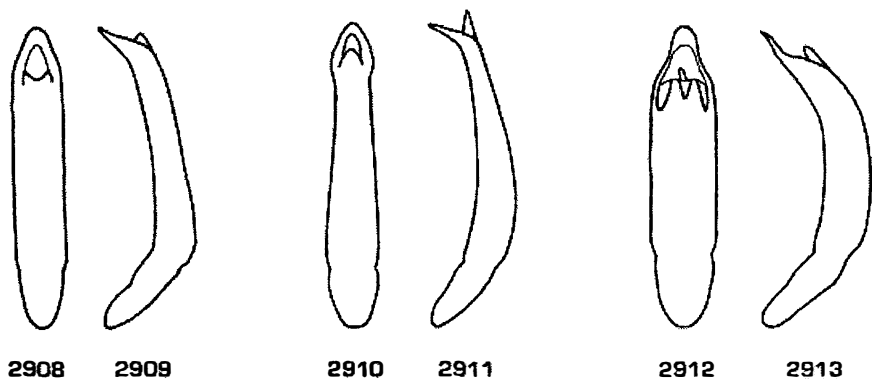
Figs 2902-2907. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1993): 2902 – 2903 – *Oreina* (*Oreina*) *viridis*; 2904, 2905 – *O. (O.) liturata*; 2906, 2907 – *O. (O.) bifrons*.

3. Puncturation of pronotum passes gradually from strong (in lateral impressions) to very fine (on central part). Elytra usually blue with two longitudinal black stripes on each. Apex of aedeagus (figs 2904, 2905) slightly bent upwards. Length 8.0–10.0 mm (= *phalerata* GERMAR, 1834). Variations: ground colour of elytra green, pronotum blue (ab. *cyanicollis* KÜHNELT, 1984), ground colour of elytra green, pronotum violaceous (ab. *violaceicollis* KÜHNELT, 1984). Forms two subspecies: elytra not very densely punctate, rather shining, lateral thickenings of pronotum slightly flattened (nominotypical subspecies), elytra densely punctate, rather matt, lateral thickening of pronotum more elevate (subsp. *thomasi* DACCORDI et RUFFO, 1977).

- Distributed in eastern part of Alps; subsp. *thomasi* in Karawanken, nominotypical subspecies in remaining part of area ..... **liturata** (SCOPOLI, 1763).
- . Puncturation of pronotum passes suddenly from strong (in lateral impressions) to very fine (on central part) ..... **4.**
4. On elytra fine secondary punctures numerous. Apical part of elytra at suture slightly flattened. Aedeagus asymmetric, its apex narrowed and rounded (figs **2906, 2907**). Length 8.0–11.0 mm. Variations: elytra unicolorous, violaceous (ab. *violacea* HÄNEL, 1938), blue or greenish-blue (ab. *cyanea* HÄNEL, 1938), black-green (ab. *aenescens* WEISE, 1884), green or bronzy-green (typical form), bronzy or cupreous (ab. *aerosa* WEISE, 1884), elytra blue with black longitudinal stripe (ab. *cyanescens* WEISE, 1884), elytra green with blue longitudinal stripe (ab. *stussineri* WEISE, 1884), elytra bronzy with bluish-green longitudinal stripe (ab. *aurata* WEISE, 1884). Forms two subspecies: body larger and broader. Puncturation of elytra entirely randomly scattered (nominotypical subspecies distributed in Alps, Dinaric Alps and Balkans), body more slender, punctures of elytra tending to form longitudinal stripes or rows (subsp. *decora* RICHTER, 1820 from Sudetes and Carpathians). Distributed in Alps, mountains of Balkan Peninsula, Carpathians and Sudetes. Reported also from Harz ..... **bifrons** (FABRICIUS, 1792).
- . On elytra fine secondary punctures sparsely scattered or almost absent ..... **5.**
5. In lateral view pronotum and elytra form two separate convexities. In female last abdominal sternite weakly but distinctly, doubly emarginate. Apex of aedeagus (figs **2908, 2909**) bent ventrally. Extremely variable species, about 60 variations were described. Upper side can be unicolorous (purply, cupreous, golden, green, blue, violaceous) or with longitudinal, usually blue stripe on each elytron. The variability involves also length and outline of body alike the sculpture of its surface. 19 subspecies were described, the most important are: subsp. *nigrina* SUFFRIAN, 1851 from Massif Central, Vosges and Pyrenees (in Pyrenees black form predominate), subsp. *straubiana* MARCHAND, 1938 from Schwarzwald, subsp. *gersfeldiana* BECHYNÉ, 1958 from Rhön (small, slender, rainbow-coloured), subsp. *gaukleri* BECHYNÉ, 1958 from Franken (small, stout, similar to *speciosissima*, subg. *Chrysochloa*, antithesis 4), subsp. *polymorpha* KRAATZ, 1880 from Harz (rainbow-coloured), subsp. *umbrosa* WEISE, 1884 from W Sudetes (dark, unicolorous), nominotypical subspecies from E Sudetes (violaceous or dark blue, unicolorous, strongly punctate), subsp. *stejskali* FLEISCHER, 1914 from Silesian part of Carpathians (finely punctate and often multicolorous), subsp. *punctatissima* SUFFRIAN, 1851 from Tatra (deep dark blue, very strongly punctate), subsp. *polonina* BECHYNÉ, 1958 from N Carpathians (large, dark violaceous), subsp. *variabilis* WEISE, 1884 from Alps (uniformly dark coloured), subsp. *kraussi* Bechyné, 1958 from Julic Alps (small, stout, rainbow-coloured), subsp. *balcanica* WEISE, 1883 (large, with dark blue pronotum and multicolorous elytra, very similar to *speciosa* (thesis 6). Distributed in all mountains of Europe except Scandinavia and Iberian Peninsula ..... **alpestris** (SCHUMMEL, 1844).
- . In lateral view pronotum and elytra form one common convexity. In female last abdominal sternite almost regularly rounded ..... **6.**
6. In lateral view operculum and apex of aedeagus (figs **2910, 2911**) form an angle of almost 90°. In dorsal view apex of aedeagus widened. Almost equally variable as *alpestris* (thesis 4), numerous forms of different rank were described. General view as in plate LXXI, **phot. 6363**. Length 8.5–12.0 mm. Forms 4 subspecies: slen-

der, usually pronotum, sides and longitudinal stripe on elytra blue, ground colour of elytra green (nominotypical subspecies from northern part of Alps), body short and stout (subsp. *ganglbaueri* JAKOB, 1953 from Pyrenees), body large and broad, longitudinal stripe on elytra vivid red (subsp. *excellens* WEISE, 1884 from Appenines and southern part of Alps), body slightly flattened, aedeagus behind apex more strongly narrowed (subsp. *pseudoliturata* MÜLLER, 1916). Distributed in all European mountains south of Danube and in Pyrenees ..... ***speciosa*** (FABRICIUS, 1781).

- In lateral view operculum and apex of aedeagus (figs **2912**, **2913**) form an acute angle. In dorsal view apex of aedeagus narrowed. Length 8.0–10.0 mm. Variations: upper side green, more rarely bronzy-green, on elytra sutural and median stripes darker (typical form), upper side blue or black blue on elytra, sutural and median stripes dark violaceous (ab. *glacialis* WEISE, 1883). Distributed in Alps ..... ***vittigera*** (SUFFRIAN, 1851).



Figs 2908-2913. Aedeagus in dorsal and lateral view (after WARCHALOWSKI 1993): 2908, 2909 – *Oreina (Oreina) alpestris*; 2910, 2911 – *O. (O.) speciosa*; 2912, 2913 – *O. (O.) vittigera*.

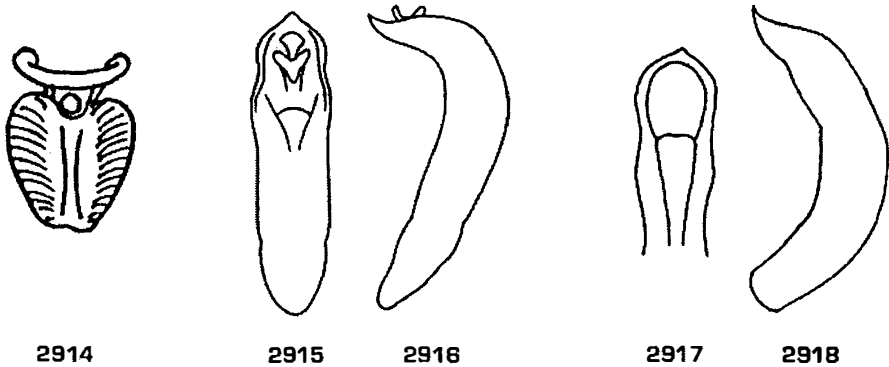
### Subgenus ***Protorina*** WEISE, 1894

#### Key to species

1. Upper side matt, body broad and flattened, lateral thickenings of pronotum flat. Usually pronotum red, elytra pitchy with reddish margins, flagellum as in fig. **2914**. General view as in plate LXXII, **phot. 640**. Length 8.0–11.0 mm (= *nigripes* FAIRMAIRE, 1856). Variation: upper side entirely black (unnamed). Alpine species, distributed in Pyrenees ..... ***ludovicae*** (MULSANT, 1854).
- Upper side or at least elytra shining, lateral thickenings of pronotum convex ... **2**.
2. Body in lateral view convex. Upper side red brick, mostly with black sutural stripe, head, underside, legs and antennae usually black. General view as in plate LXXII, **phot. 641**. Aedeagus as in figs **2915**, **2916**. Length 8.0–10.0 mm. Variations: colouration of body as in description (typical form), elytra blackish except lateral

margins and epipleura (ab. *dorsalis* WEISE, 1887), elytra uniformly red, without sutural stripe (ab. *distinctissima* ULANOWSKI, 1886), on upper side only hind part of head black, antennae and legs almost entirely red (ab. *rufipes* WEISE, 1894). Forms 7 subspecies: upper side finely punctate, body slightly more convex than in remaining forms (nominotypical subspecies from Carpathians), aedeagus similar as in *melancholica* (figs 2919, 2920) (subsp. *shipkana* JAKOB, 1952 from Stara Planina); length of body not exceeding 10.0 mm, upper side feebly shining, (subsp. *retenta* WEISE, 1884 from northern part of Dinaric Alps), lateral thickenings of pronotum broader and more elevate than in remaining forms (subsp. *herzegoviniensis* BECHYNÉ, 1958 from southern part of Dinaric Alps); in further subspecies aedeagus somewhat different: ab. *distinctissima* predominates (subsp. *commutata* SUFFRIAN, 1861 from E Alps), black pattern of elytra always present (subsp. *pennina* BINAGHI, 1938 from southern part of Central Alps), body more stout, upper side dark red (subsp. *sibylla* BINAGHI, 1938 from Appenines). Distributed in Appenines, Alps, Carpathians and in mountains of Balkan Peninsula ..... ***plagiata*** (SUFFRIAN, 1861).

-. Body in lateral view flat ..... **3.**

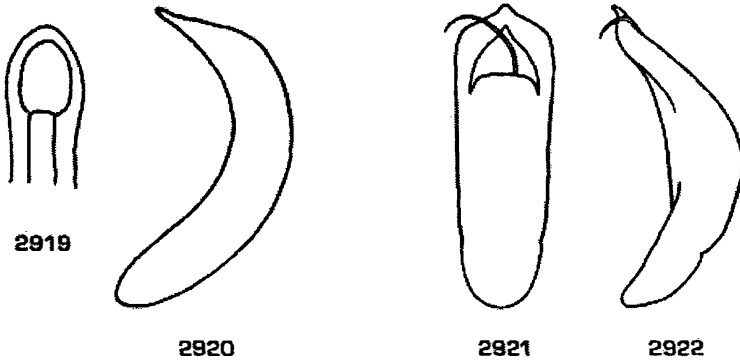


Figs 2914-2918. Aedeagus in dorsal and lateral view, flagellum (after WARCHAŁOWSKI 1993): 2914 – *Oreina (Protorina) ludovicae*; 2915, 2916 – *O. (P.) plagiata*; 2917, 2918 – *O. (P.) peirolerii*.

3. Anterior angles of pronotum obtuse, thickened. Elytra widened posteriad, strongly and densely punctured. Lateral thickening of pronotum distinct on almost whole length. Aedeagus as in figs 2917, 2918. Length 9.0–11.0 mm. Distributed in Alps (Alpi Cozie and Alpi Pennine) ..... ***peirolerii*** (BASSI, 1834).
- . Anterior angles of pronotum sharp, flattened. Lateral margins of elytra parallel, its surface less densely and strongly punctate. Aedeagus as in figs 2919, 2920. Length 7.5–10.0 mm (= *melanocephala* DUFTSCHMIDT, 1825, nec DEGEER, 1775). Variations: head black, pronotum and elytra red (ab. *melanocephala* DUFTSCHMIDT, 1825), upper side entirely black (typical form). Distributed in Alps ..... ***melancholica*** (HEER, 1845).

Subgenus *Virgulatorina* KÜHNELT, 1984

One species only. Aedeagus as in figs 2921, 2922. Geographical and individual variability very great, at least 30 forms were described. Names of varieties sometimes correspond with names of subspecies. Length 7.0–9.5 mm. The most important forms: elytra matt, upper side usually multicolorous (typical form), elytra matt, pure black, strongly punctate (ab. *peneau* DAVID, 1953), elytra shining, upper side unicolorous, usually greenish blue and blue (ab. *mona* BECHYNÉ, 1958), elytra shining, multicolorous (ab. *ljubetensis* APFELBECK, 1912), elytra shining, upper side blue black or black violaceous (ab. *praefica* WEISE, 1884). Forms 5 subspecies: elytra reticulate, matt (nominotypical subspecies from western part of Alps), elytra shining, unicolorous (subsp. *mona* BECHYNÉ, 1958 from SE Alps, Carpathians and Sudetes), elytra shining, usually multicolorous (subsp. *candens* WEISE, 1884 from northern part of Alps), sides of pronotum strongly punctate (subsp. *ljubetensis* APFELBECK, 1912 from mountains of Balkan Peninsula), body conspicuously slender (subsp. *isofastuosa* BECHYNÉ, 1958 from Apennines and Julic Alps). Distributed in mentioned areas ..... *virgulata* (GERMAR, 1824).



Figs 2919–2922. Aedeagus or its apical part in dorsal and lateral view (after WARCHALOWSKI 1993): 2919, 2920 – *Oreina (Protorina) melancholica*; 2921, 2922 – *O. (P.) virgulata*.

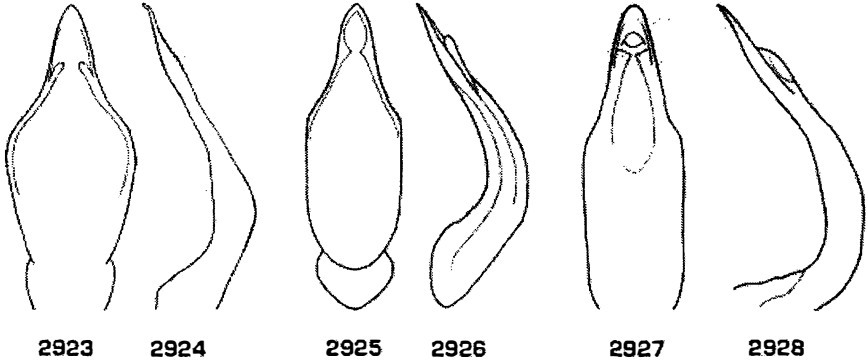
Genus *Oreomela* JACOBSON, 1895

Genus *Oreomela* contains about 90 species distributed exclusively in mountains of continental Asia from Transcaspia to S China. It was divided by JACOBSON (1926) into six subgenera, but this division was later rejected (SEENO and WILCOX 1982) or applied only partly and inconsistently. In discussed area about 60 species, remaining occurs in Kashmir, Nepal, Bhutan, Tibet (Xizang) and S China. Females are often indeterminate. Insufficiently studied species *O. cupreata* CHEN, 1976 from Tsinghai not included in the key.



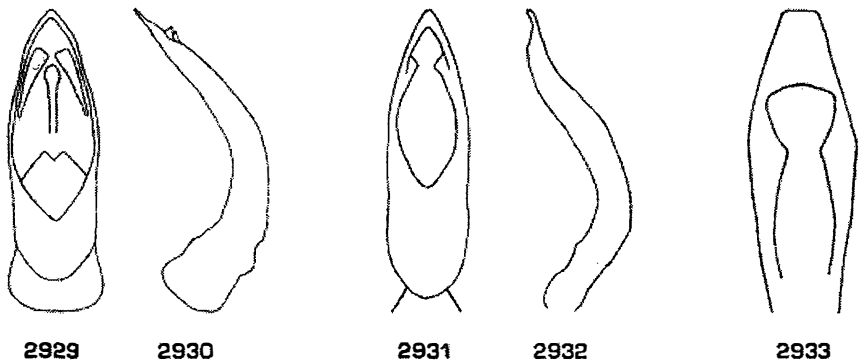
Key to species

- 1. Primary puncturation on elytra arranged in longitudinal rows ..... 2.
- Primary puncturation random or at most here and where arranged in indistinct rows ..... 5.



Figs 2923-2928. Aedeagus in dorsal and lateral view (2925, 2926 after LOPATIN 2007, remaining after LOPATIN 1977): 2923, 2924 – *Oreomela (Oreomela) sworovi*; 2925, 2926 – *O. (O.) milae*; 2927, 2928 – *O. (O.) korolkovi*.

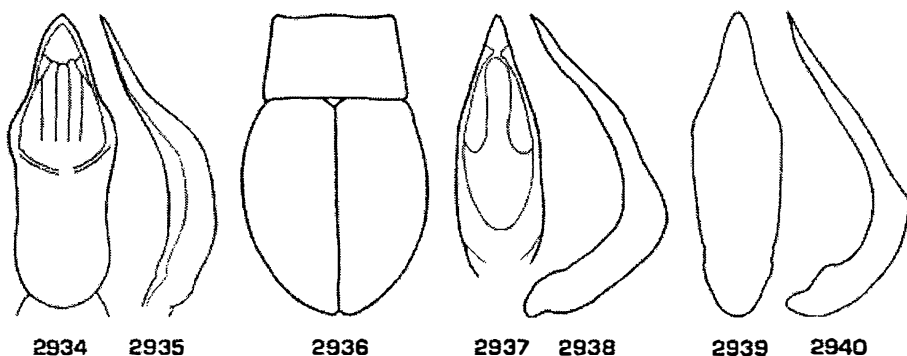
- 2. Upper side bicolorous: pronotum black, elytra red or orange. Rows on elytra distinct, punctures rather strong ..... 3.
- Upper side unicolorous, black-green, with metallic reflex. Puncture rows regular on disc of elytra, on sides somewhat random ..... 4.



Figs 2929-2933. Aedeagus in dorsal and lateral view (2929, 2930 after LOPATIN 2005, 2931, 2932 after LOPATIN 2002, 2933 after LOPATIN 1974): 2929, 2930 – *Oreomela (Oreomela) dolini*; 2931, 2932 – *O. (Oreomela) borochorensis*; 2933 – *O. (O.) arnoldii*.

3. Elytra red, rows of punctures more regular. Intervals slightly convex. General view as in plate LXXII, **phot. 642**. Aedeagus as in figs **2923, 2924**. Length 5.1–6.6 mm. Described from NW China (Sinkiang, mountains Borochooro) ..... *(Olcomela) suvorovi* JACOBSON, 1910.
- . Elytra orange, puncture rows somewhat less regular. Intervals flat. Aedeagus as in figs **2925, 2926**. Length 5.5–6.7 mm ..... *(Olcomela) milae* LOPATIN, 2007.
4. Antennae not particularly short or thickened. Aedeagus as in figs **2927, 2928**. Length 4.8–5.8 mm. Described from E Kazakhstan ..... *(Olcomela) korolkovi* JACOBSON, 1926.
- . Antennae short and relatively thick, antennomeres 7–9 barely longer than broad. Aedeagus as in figs **2929, 2930**. Female unknown. Length of body not given, described from E Kazakhstan based on one male only ..... *(Olcomela) dolini* LOPATIN, 2005.
5. Epipleura narrow, from basis to 2/3 of their length only weakly narrowed. Species from Mongolia, Tibet and Tsinghai ..... **6**.
- . Epipleura anteriorly broad, from basis to 2/3 of their length distinctly narrowed. Species from other areas..... **12**.
6. Head punctured stronger than elytra. Pronotum not subquadrate, about 1.8 × broader than long ..... **8**.
- . Head punctured finer than elytra. Pronotum subquadrate ..... **7**.
7. Pubescence on pronotum and elytra very sparse, not distinctly visible. Upperside with purplish or violaceous reflex, underside brownish black. Legs piceous with metallic reflex. Antennae brown. four basal antennomeres paler. Aedeagus not studied. Length 4.0–4.5 mm. Described from Tsinghai ..... (subgenus?) *nigroviolacea* CHEN, 1976.
- . Pubescence on pronotum and elytra fairly distinct. Externally similar to *nigroviolacea* (thesis 7). Aedeagus not studied. Length 4.5 mm. Described from vicinity of lake Kuku-Nor ..... *(Leptomela) koltzei* WEISE, 1896.
8. Hind angles of pronotum obtuse, often rounded. Legs pale. Puncturation of elytra arranged in somewhat indistinct geminate rows. Aedeagus insufficiently studied. Length 3.9–4.1 mm (male) to 4.2–5.0 mm (female). One variation (as subspecies) is described: puncturation of pronotum less densely scattered, femora darkened (var. *njamtzoana* JACOBSON, 1926). Described from NW China (Tsinghai) ..... *(Leptomela) kaznakovi* JACOBSON, 1926.
- . Hind angles of pronotum right or almost right ..... **9**.
9. Puncturation of elytra somewhat stronger than on pronotum, punctures connected by fine scratches or rugosities, upper side feebly shining, somewhat silky ..... **10**.
- . Puncturation of elytra considerably finer than on pronotum. Pronotum 1.4 × broader than long, on lateral borders somewhat stronger punctured than on disc. Lateral sides in hind 2/3 almost straight. Marginal ridge surrounds Anterior angles encroaching on anterior margin approximately to eye. Aedeagus as in figs **2931, 2932**. Length 4.5–5.6 mm. Described from Sinkiang (Borochooro mountains, E Tian-Shan) ..... (s. str.) *borochoensis* LOPATIN, 2002.
10. Puncturation of elytra somewhat rugulose, in female almost entirely random, in male arranged in short rows. Aedeagus insufficiently studied. Length about 4.0 mm (male) to 5.1 mm (female). Described from Tsinghai ..... *(Leptomela) grumi* JACOBSON, 1926.

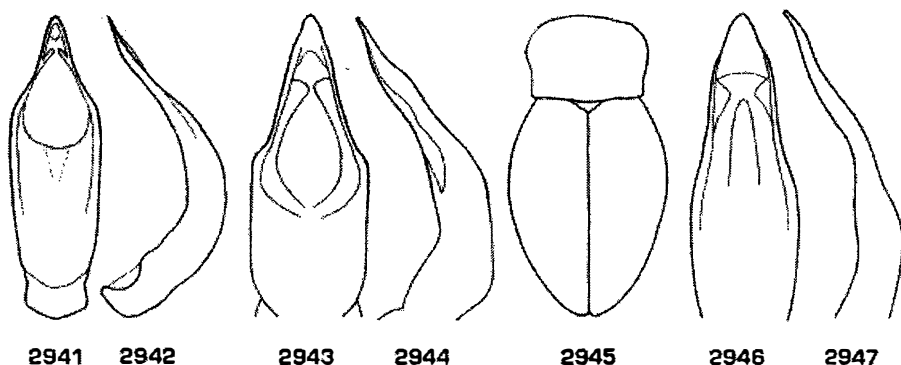
- Punctuation of elytra not rugulose ..... 11.
- 11. Apex of aedeagus narrowed and broadly rounded. Length 5.2–5.4 mm. Described from NW Mongolia ..... (*Entomomela*) ***oirata*** JACOBSON, 1926.
- Apical part of aedeagus (fig. 2933) gradually narrowed, apex almost transversely cut. Body not large, its length in the original description not given, pitchy black, upper side moderately shining, legs pale rusty-brownish, femora partly blackened. Described from W Mongolia ..... (*Entomomela*) ***arnoldii*** LOPATIN, 1974.
- 12. Anterior angles of pronotum angulated or narrowly rounded ..... 13.
- Anterior angles of pronotum rounded ..... 32.
- 13. Basal margin of pronotum without marginal ridge ..... 14.
- Basal margin of pronotum with marginal ridge ..... 18.
- 14. Pronotum 1.85 × broader than long, almost regularly rectangular (fig. 2936), only very slightly trapezium-like broadened posteriad, strongly flattened, lateral sides straight with very narrow marginal ridge. Upper side black with dark green metallic reflex. Femora pitchy-brown, tibiae and tarsi rusty-yellow, claw tarsomeres darkened. Aedeagus as in figs 2934, 2935. Length 5.0–5.8 mm. Described from Kyrghyzstan (N Tian-Shan, Kungey Alatau mountains) ..... (s. str.) ***recticollis*** LOPATIN, 1995.
- Pronotum not rectangular ..... 15.



Figs 2934-2940. Outline of body, aedeagus in dorsal and lateral view (2934-2936 after LOPATIN 1995; 2937-2940 after LOPATIN 1977): 2934-2936 – *Oreomela (Oreomela) recticollis*; 2937, 2938 – *O. (O.) semenovi*; 2939, 2940 – *O. (O.) transiliensis*.

- 15. General colour dark bronzy. Pronotum strongly and closely punctured, basal and anterior margins without marginal ridge. Elytra reticulated or finely rugulose, distinctly finer punctured than pronotum. Aedeagus not studied. Length of male 3.8 mm, of female 5.5–6.0 mm. Insufficiently studied species, described from NW China as representative of ?subgenus *Apaksha* MAULIK, 1926, because of not completely closed anterior coxal cavities ..... (?*Apaksha*) ***tianshanica*** CHEN, 1961.
- General colour not dark bronzy ..... 16.

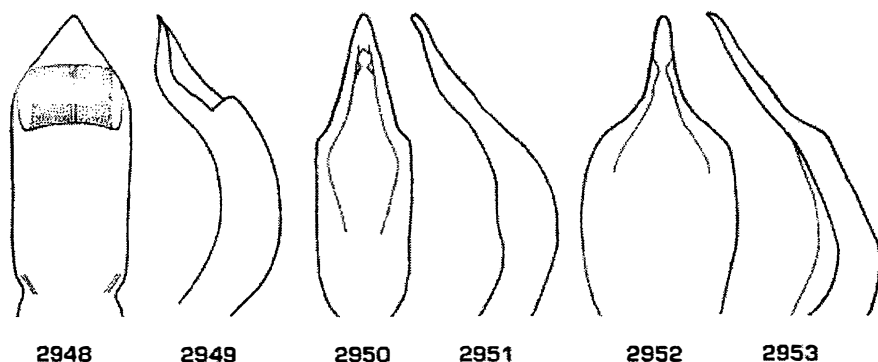
16. Legs pitchy, sometimes knees and tarsi paler. Upper side golden-green or metallic blue, rarely bluish-violaceous. Pronotum near hind angles covered by strong and deep punctures, in central part puncturation fine and not dense. Hind angles of pronotum right or somewhat sharpened. Aedeagus as in figs 2937, 2938. Length 4.0–5.6 mm. Described from S Kazakhstan ..... (s. str.) *semenovi* JACOBSON, 1895.
- . Legs yellow or rusty-yellow ..... 17.
17. Pronotum on whole surface finely and very densely punctured, its borders in hind part additionally covered by considerably stronger punctures. Pronotum shorter, 1.5–1.6 × broader than long. Elytra stronger and less densely punctured than pronotum. Upper side with metallic shine, greenish-blue. Aedeagus as in figs 2939, 2940. Length 4.8–5.2 mm. Described from S Kazakhstan ..... (s. str.) *transiliensis* LOPATIN, 1976.
- . Pronotum on whole surface stronger and less densely, uniformly punctured. Pronotum longer, 1.3–1.4 × broader than long. Upper side bluis-green or bluish-violaceous. General view as in plate LXXII, phot. 643. Aedeagus as in figs 2941, 2942. Length 5.0–6.2 mm. Described from Kyrghyzstan ..... (s. str.) *fuscipes* (WEISE, 1885).
18. Basal ridge of pronotum narrower than lateral ridge, distinctly punctured. Legs and basal antennomeres rusty-yellowish ..... 19.
- . Basal ridge of pronotum not narrower than lateral ridge, somewhat indistinctly punctured ..... 27.



Figs 2941–2947. Outline of body, aedeagus in dorsal and lateral view (2941, 2942 after LOPATIN 1977; 2946, 2947 after LOPATIN 1990, remaining after LOPATIN 1995): 2941, 2942 – *Oreomela (Oreomela) fuscipes*; 2943–2945 – *O. (O.) kabaki*; 2946, 2947 – *O. (O.) dzhungara*.

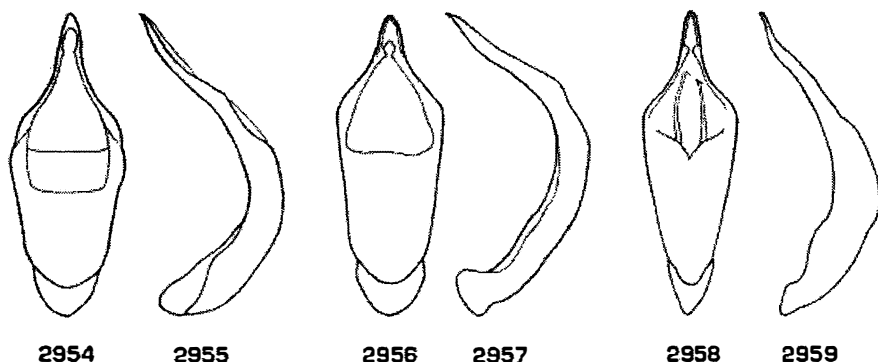
19. Upper side pure black, at most with very weak bronzy reflex, feebly shining ... 26.
- . Upper side with metallic shine, golden-black or greenish-black ..... 20.
20. Pronotum 1.6–1.7 × broader than long, hind angles straight, anterior angles slightly obtuse ..... 21.
- . Pronotum 1.4 × broader than long ..... 24.
21. Body elongate, slender, general outline as in fig. 2945. Anterior angles of pronotum rounded, hind angles approximately right. Puncturation of pronotum differen-

- tiated, consisting of strong and fine punctures. Antenna relatively short, antennomeres 7–11 thickened. Elytra covered by punctures similar to fine punctures of pronotum. Aedeagus as in figs **2943**, **2944**. Length 5.4 mm. Described from E Tian-Shan (Dzhungarskiy Alatau) ..... (s. str.) ***kabaki*** LOPATIN, 1995.
- . Body not slender ..... **22**.
22. Antennomere 2 as long as 3. Elytra rather stronger punctured than pronotum. Surface of pronotum covered by loosely scattered, minute, barely perceptible hairs. Legs black or pitchy black, tibiae somewhat slightly lightened. Aedeagus as in figs **2946**, **2947**. Length 5.5–6.0 mm. Described from E Kazakhstan (Dzhungarskiy Alatau range) ..... (s. str.) ***dzhungara*** LOPATIN, 1990.
- . Antennomere 2 distinctly, 1.5–2.0 × shorter than 3. Elytra not stronger punctured than pronotum ..... **23**.
23. Species from Dhungaria (NW China and E Kazakhstan). Aedeagus not studied. Length 4.8–6.6 mm. Described, possibly based on mixed material ..... (s. str.) ***przewalskii*** JACOBSON, 1897.
- . Species from Iran and Pakistan. Apex of aedeagus in dorsal view triangular (figs **2948**, **2949**). Length about 5.0 mm (nominotypical subspecies from Pakistan) to 6.8–7.7 mm (subsp. *mohri* DACCORDI, 1975 from Iran) ..... (s. str.) ***meridionalis*** LOPATIN, 1967.
24. Larger. Elytra somewhat rugulose, Legs and antennomeres 1–5 yellowish red. Frons with deep punctures and a longitudinal furrow. Here two very similar and perhaps conspecific species from E Kazakhstan ..... **25**.
- . Smaller. Elytra not rugulose, ground very finely scratched. Antennomeres 1–5. Femora and tibiae reddish yellow, tarsi dark brown. Aedeagus not studied. Length 4.8–5.0 mm. Described from W Sinkiang ..... (s. str.) ***juldušana*** LOPATIN, 1962.
25. Male unknown, aedeagus not studied. Length 6.2 mm. Described from SE Kazakhstan ..... (s. str.) ***joliveti*** LOPATIN, 1976.
- . Aedeagus as in figs **2950**, **2951**. Length 5.8–6.1 mm. Described from SE Kazakhstan ..... (s. str.) ***korotjaevi*** LOPATIN, 1983.



Figs 2948-2953. Aedeagus in dorsal and lateral view (2948, 2949 after LOPATIN 1967; 2950, 2951 after LOPATIN and KULENOVA 1986; 2952, 2953 after LOPATIN 1977): 2948, 2949 – *Oreomela (Oreomela) meridionalis*; 2950, 2951 – *O. (O.) korotjaevi*; 2952, 2953 – *O. (O.) dungana*.

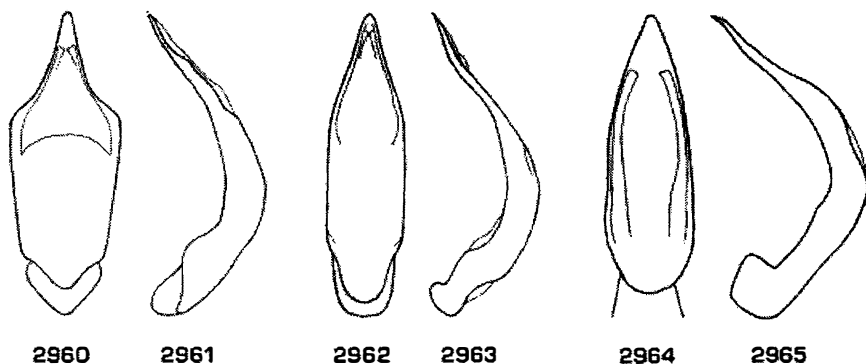
26. Body more elongate, somewhat flattened, elytra in female not discoidal. Pronotum with right angles, in male hind angles slightly sharpened, its central part not densely punctate, lateral borders and basal part covered by strong puncturation. Aedeagus as in figs **2952, 2953**. Length 5.0–6.0 mm. Described from E Kirghyzstan ..... (s. str.) ***dungana*** JACOBSON, 1926.
- . Body shorter, elytra in female discoidal. Pronotum covered by rather sparse, deep punctures, its lateral borders and basal part punctured strongly, but also rather sparsely. Elytra shining, distinctly and moderately strongly punctured, interstices covered by sparse, thin scratches. Aedeagus as in figs **2954, 2955**. Length 4.8–6.0 mm (= *invisa* LOPATIN, 1962). Described from Kirghyzstan ..... (s. str.) ***weisei*** JACOBSON, 1995.
27. Pronotum distinctly narrower than basal part of elytra, its hind angles right .... **28**.
- . Pronotum broad, not narrower than basal part of elytra, hind angles obtuse, anterior margin at angles with ridge ..... **30**.
28. Antennae and legs dark, pitchy-brown, tibiae somewhat lightened. Pronotum 1.7 × broader than long, its lateral sides feebly and only in anterior part rounded, in hind part straight or slightly emarginate. Strong punctures at hind angles sparse, disc covered by sparse, fine, distinct puncturation. Aedeagus as in figs **2956, 2957**. Length 4.8–5.8 mm. Described from Kirghyzstan ..... (s. str.) ***rueckbeili*** JACOBSON, 1926.
- . Most part of antennae, legs and pygidium yellow ..... **12**.



Figs 2954-2959. Aedeagus in dorsal and lateral view (after LOPATIN 1977): 2954, 2955 – *Oreomela (Oreomela) weisei*; 2956, 2957 – *O. (O.) rueckbeili*; 2958, 2959 – *O. (O.) scutellaris*.

29. Scutellum and basal border of pronotum rusty-yellow or brownish-red. Upper side blue or black-blue. Lateral sides of pronotum steadily rounded. Elytra shining, covered by fine puncturation and fine scratches. Aedeagus as in figs **2958, 2959**. Length 4.8–5.0 mm. Described from Kirghyzstan ..... (s. str.) ***scutellaris*** JACOBSON, 1926.
- . Scutellum and basal border of pronotum dark. Upper side blackish greenish blue. Lateral sides of pronotum in anterior half stronger rounded. Elytra densely

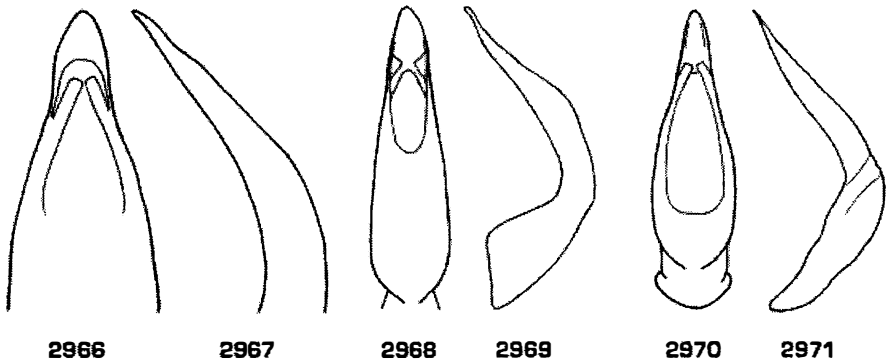
- rugulose, their punctures moderately fine. Male unknown, aedeagus not studied. Length 5.7 mm. Described from Kirghyzstan ..... (s.str.) *sarydzhasea* JACOBSON, 1926.
30. Legs dark ..... **31.**
- . Legs yellow. Hind angles of pronotum almost right, lateral sides more gently rounded. Elytra blue-violaceous, pronotum with golden-cupreous reflex. Pronotum almost 2 × broader than long, its puncturation triple: large, pit-like punctures situated laterally, moderately strong and fine punctures on the central part. Elytra covered by fine, somewhat rugulose puncturation. Aedeagus not studied. Female unknown. Length 4.8 mm. Described from Kirghyzstan ..... (s. str.) *andreevi* JACOBSON, 1926.
31. Punctures on pronotum more fine and dense. Hind angles of pronotum obtuse, lateral sides steadil and strongly rounded. Upper side dark blue or dark greenish-blue, shining, elytra often blackish violaceous. Antennae yellow with black spots on antennomeres. Pronotum 1.7–1.8 × broader than long. Elytra covered by fine punctures and thin scratches. Aedeagus as in figs **2960**, **2961**. Length 5.0–6.0 mm. Described from Ketmen mountains in SE Kirghyzstan ..... (s. str.) *tarantscha* JACOBSON, 1926.
- . Punctures of pronotum more coarse and close. Remaining characters as in *tarantscha* (thesis 31). Aedeagus not studied. Length 5.5 mm. Described from Tsinghai based on one female only ..... (s. str.) *coerulea* CHEN, 1976.



Figs 2960-2965. Aedeagus in dorsal and lateral view (after LOPATIN 1977): 2960, 2961 – *Oreomela (Oreomela) tarantscha*; 2962, 2963 – *O. (O.) hohlbecki*; 2964, 2965 – *O. (O.) celyphoides*.

32. Puncturation of pronotum strongly differentiated, stronger punctures on sides and on basis almost pit-like, fine or moderately fine puncturation covers the disc. Pronotum usually less convex and less narrowed posteriad ..... **33.**
- . Puncturation on pronotum more or less uniform, rather strong. Pronotum usually strongly convex, basal margin without ridge ..... **37.**
33. Marginal ridge on sides of pronotum broad. Legs dark. Puncturation of elytra fine ..... **34.**
- . Marginal ridge on sides of pronotum thin ..... **35.**

34. Antennomere 2 almost 2 × shorter than 3. Pronotum almost 2 × broader than long, covered by rugulose punctures. Punctures of elytra rugulose, random. Upper side black-violaceous. Aedeagus as in figs **2962**, **2963**. Length 4.6–6.0 mm. Kirghyzstan ..... (s. str.) ***hohlbecki*** JACOBSON, 1926.
- . Antennomere 2 somewhat, but not 2 × shorter than 3. Pronotum in anterior part broadened, its puncturation not rugulose. Upper side bronzy-black. Aedeagus as in figs **2964**, **2965**. Length 4.5–5.5 mm. Distributed in SE Kazakhstan (Dzhungar Alatau) and NW China (Sinkiang) ..... (s. str.) ***celyphoides*** JACOBSON, 1897.
35. Strong punctures scattered on whole surface of pronotum ..... **36**.
- . Strong punctures on pronotum scattered on its basal part only. Pronotum 1.6 × broader than long. Upper side silky, with dark greenish shine. Antennomeres 4–11 black. Puncturation of elytra uniform, rather fine, interstices densely and finely rugulose. Aedeagus as in figs **2966**, **2967**. Length 6.0–6.8 mm. Described from E Kazakhstan (Tarbagatai) ..... (s. str.) ***tarbagataica*** LOPATIN, 1968.

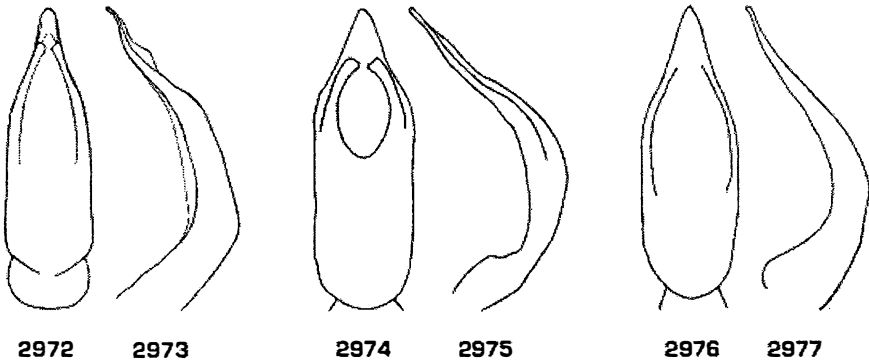


Figs 2966-2971. Aedeagus in dorsal and lateral view (after LOPATIN 1977): 2966, 2967 – *Oreomela (Oreomela) tarbagataica*; 2968, 2969 – *O. (O.) jacobsoni*; 2970, 2971 – *O. (O.) bergi*.

36. Lateral sides of pronotum distinctly emarginate before hind angles. Hind angles right, protruding. Anterior angles rounded somewhat only on apex. Upper side shining, bronzy-black, legs and antennae dark, antennomeres 1–3 rusty beneath. Aedeagus as in figs **2968**, **2969**. Length 5.0–6.3 mm (= *trotzinai* JACOBSON, 1894). Described from Kirghyzstan (Alai Range) ..... (s. str.) ***jacobsoni*** SEMENOV, 1894.
- . Lateral sides of pronotum not or indistinctly emarginate before hind angles. Hind angles not protruding. Anterior angles broadly rounded. Upper side, bronzy-black, sometimes with golden hue. Aedeagus as in figs **2970**, **2971**. Length 5.0–6.5 mm. Distributed in Turkmenistan and Tadzhikistan ..... (s. str.) ***bergi*** JACOBSON, 1910.
37. Anterior margin of pronotum without ridge or the ridge is present only at angles ..... **40**.
- . Anterior margin of pronotum with ridge on whole length ..... **38**.
38. Pronotum short, about 2 × broader than long. Puncturation of pronotal disc dense and relatively fine, hind angles obtuse, often rounded. Upper side violaceous or



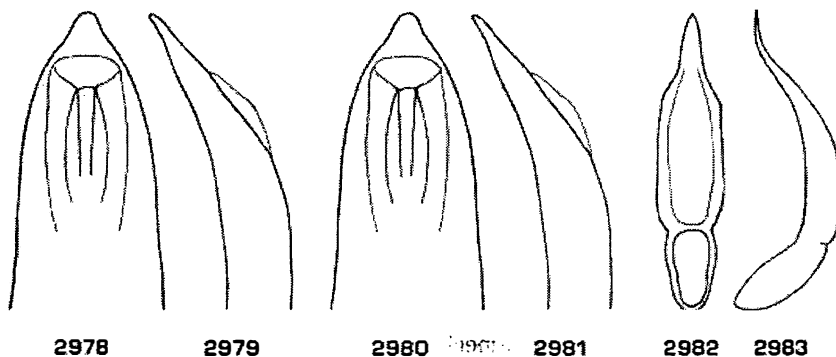
- bluish violaceous, more rarely greenish or with golden-cupreous reflex. Antennomeres 1–3, hind borders of abdominal sternites, femora and tibiae rusty-yellow, tarsi and clypeus pichy brown. Aedeagus as in figs 2972, 2973. Length 4.6–6.4 mm. Distributed in Kirghyzstan ..... (s. str.) *tschernavini* JACOBSON, 1926.
- . Pronotum longer, about 1.4–1.5 × broader than long. Puncturation of pronotum strong and deep ..... 39.
39. Larger. Upper side black-blue, shining. Antennomeres 1–3 and legs yellow orange. Aedeagus as in figs 2974, 2975. Length 5.7–6.5 mm. Described from Sinkiang .... (s. str.) *rufipes* LOPATIN, 2002.
- . Somewhat smaller. Upper side black-brown with bronzy reflex, stronger on elytra. Antennomeres 1–5 basally, femora and tibiae yellow orange, tarsi brown. Aedeagus as in figs 2976, 2977. Length 5.4–5.6 mm. Described from Sinkiang ..... (s. str.) *cheni* LOPATIN, 2002.



Figs 2972-2977. Aedeagus in dorsal and lateral view (2972, 2973 after LOPATIN 1977, remaining after LOPATIN 2002): 2972, 2973 – *Oreomela (Oreomela) tschernavini*; 2974, 2975 – *O. (O.) rufipes*; 2976, 2977 – *O. (O.) cheni*.

40. Basis of elytra entirely without marginal ridge ..... 44.
- . Basis of elytra margined near humeri ..... 41.
41. Disc of pronotum covered by not particularly strong puncturation, without impressions ..... 42.
- . Disc of pronotum covered by strong punctures and with 4 small impressions in the middle. Pronotum short, more than 2 × broader than long. Upper side dark golden-cupreous, pronotum with more greenish hue. Legs dark. Punctures on elytra barely finer than on pronotum, slightly rugulose. Aedeagus not studied, female unknown ... (s. str.) *radkewiczi* JACOBSON, 1926.
42. Black with a violaceous sheen. Antennae red brown, antennomeres 6–11 black. Apex of abdomen and legs fulvous. Aedeagus not studied. Externally similar to *radkewiczi*, (antithesis 41), differing by other colouration of legs. Length 4.2–5.5 mm. Described from Tsinghai ..... (s. str.) *caudata* CHEN, 1976.
- . Metallic reflex of upper side greenish or absent ..... 43.

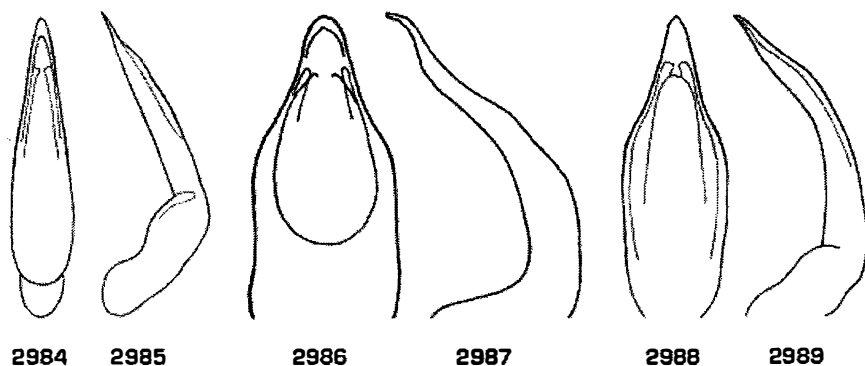
43. Pronotum  $1.7 \times$  broader than long. Upper side black with greenish reflex, antennae and legs black, antennomeres 2 and 3, tarsi and tibiae partly brown. Aedeagus as in figs 2978, 2979. Length 5.5–6.5 mm. Described from Kansu ..... (s. str.) *gansuica* LOPATIN, 2002.
- . Pronotum  $1.3 \times$  broader than long. Upper side black-brown, antennomeres 1–4 reddish yellow, remaining pitchy. Legs pale brown. Anterior angles of pronotum rounded, hind angles somewhat obtuse. Male unknown, length of body not given. Description based on one female only, from vicinity of lake Kuku-Nor (Tsinghai) ... (s. str.) *kaszabi* LOPATIN, 1962.
44. Marginal ridge on lateral sides of pronotum at less in the middle broadened .... 45.
- . Marginal ridge on lateral sides of pronotum thin on whole length ..... 46.
45. Lateral margins of pronotum slightly bent up and with a narrow gutter. Hind angles sharp, protruding. Lateral margin of elytra on anterior  $1/4$  bent up, sharp. Punctuation on central part of elytra stronger, but considerably finer than on pronotum, interstices rather sparsely covered by thin scratches. Upper side black with greenish-bronzy reflex, legs and antennae black. General view as in plate LXXII, phot. 645. Aedeagus as in figs 2980, 2981. Length 6.0–6.3 mm. Described from Tadzhikistan ..... (s. str.) *medvedevi* LOPATIN, 1968.
- . Lateral margins of pronotum broadened only in the middle. Upper side blue, shining, antennae and legs dark. Male unknown, aedeagus not studied. Length 6.0 mm. Described from Kirghyzstan (Talasskiy Alatau mountains) ..... (s. str.) *abramovi* JACOBSON, 1926.



Figs 2978–2983. Aedeagus in dorsal and lateral view (2978, 2979 after LOPATIN 2002; 2980, 2981 after LOPATIN 1977; 2982, 2983 after GRUEV 1991): 2978, 2979 – *Oreomela (Oreomela) gansuica*; 2980, 2981 – *O. (O.) medvedevi*; 2982, 2983 – *O. (O.) lopatini*.

46. Punctuation on elytra considerably finer than on pronotum ..... 48.
- . Punctuation on elytra stronger and more densely scattered than on pronotum ... 47.
47. Upper side vivid golden-green, basis of antennae, legs, metasternum and epipleura of elytra rusty-yellow. Aedeagus not studied. Length 5.9 mm. Described from Kirghyzstan ..... (s. str.) *kutzenkoi* JACOBSON, 1926.

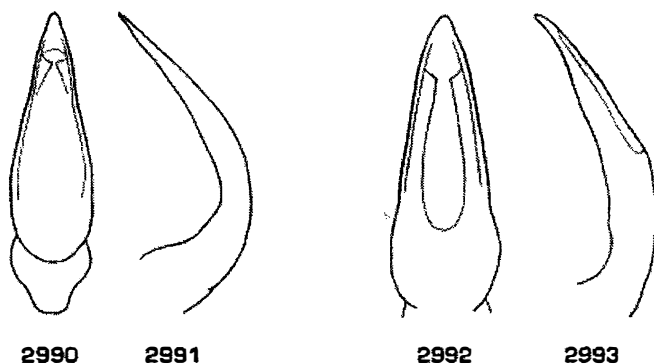
- Upper side more weakly shining, body outline somewhat more slender. Aedeagus as in figs **2982, 2983**. Length 4.9 mm. perhaps conspecific with *kutzenkoi* (thesis 47). Described from Kirghyzstan ..... (s. str.) **lopardini** GRUEV, 1991.
- 48. Pronotum only slightly broader than head, in anterior half uniformly, feebly, roundish broadened ..... **49**.
- Pronotum considerably broader than head, in anterior half strongly, roundish broadened ..... **53**.
- 49. Body more stout, oval. lateral sides distinctly rounded also in males. Pronotum 1.4 × broader than long. Elytra blue, pronotum with greenish hue. Elytra regularly oval, 1.25 × longer than together broad, covered by moderately fine, rugulose puncturation. Aedeagus not studied. Length 5.2–5.6 mm. Described based on two males from Kirghyzstan (Kungei Alatau mountains) ..... (s. str.) **kungeica** LOPATIN, 1976.
- Body elongate-oval, lateral sides in males weakly rounded. Elytra dark black-green, with bronzy or bluish reflex ..... **50**.
- 50. Legs and antennae black with metallic reflex ..... **51**.
- Legs and antennae brown, knees and basis of antennae rusty-reddish. Aedeagus as in figs **2984, 2985**. Length 4.7–5.5 mm. Described from Kirghyzstan ..... (s. str.) **zaslavskii** LOPATIN, 1976.



Figs 2984-2989. Aedeagus in dorsal and lateral view (2986, 2987 after LOPATIN 1987, remaining after LOPATIN 1977): 2984, 2985 - *Oreomela (Oreomela) zaslavskii*; 2986, 2987 - *O. (O.) susamyrica*; 2988, 2989 - *O. (O.) transalaica*.

- 51. Externally similar to *heydeni* (thesis 58), but on average smaller, pronotum narrower and only feebly broadened anteriorly. Aedeagus not studied. Length 4.8–5.5 mm. Insufficiently studied species, described from NW China (Sinkiang) ..... (s. str.) **muzartea** JACOBSON, 1926.
- Not as above ..... **52**.
- 52. Aedeagus as in figs **2984, 2985**. Length 4.3–5.3 mm. Described from Kirghyzstan (Susamyr) ..... (s. str.) **susamyrica** LOPATIN, 1987.

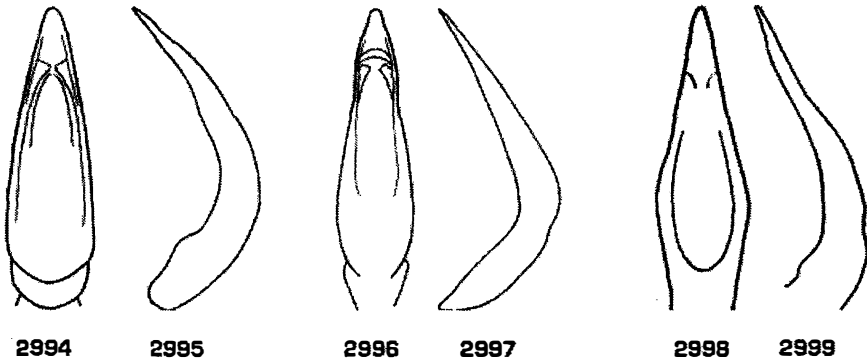
- Aedeagus as in figs **2988, 2989**. Length 7.0–7.5 mm. Described from Kirghyzstan ...  
..... (s. str.) ***transsalaica*** LOPATIN, 1965.
- 53. Hind angles of pronotum sharp, protruding. Punctures on pronotum large and deep, somewhat larger than on head. Elytra covered by fine puncturation and rugosities. Upper side black with bluish or bluish-greenish reflex, slightly silky. Antennae and legs rusty-brownish, except for darkened tarsi and a few apical antennomeres. Aedeagus as in figs **2990, 2991**. Length 4.8–6.1 mm. Described from Kirghyzstan ..... (s. str.) ***sapozhnikovi*** JACOBSON, 1926.
- Hind angles of pronotum right, not protruding ..... **54.**



Figs 2990-2993. Aedeagus in dorsal and lateral view (after LOPATIN 1977): 2990, 2991 – *Oreomela (Oreomela) sapozhnikovi*; 2992, 2993 – *O. (O.) clypealis*.

- 54. Clypeus punctured, feebly convex. Gutter on frons weak or absent ..... **55.**
- Clypeus smooth, strongly convex. Frons on whole length with a deep gutter, rugosely punctured. Elytra finely punctured, in female oval. Antennae and legs dark. Aedeagus as in figs **2992, 2993**. Length 4.8–6.0 mm. Described from Kirghyzstan ..... (s. str.) ***clypealis*** JACOBSON, 1901.
- 55. Antennomere 2 much shorter than 3. Body length 5.3–6.4 mm, elytra strongly and densely punctured ..... **30.**
- Antennomere 2 as long as 3. Body black, often with weak golden reflex. Metallic reflex on elytra blue, blue-violaceous or blue-greenish. Pronotum 2 × broader than long, in anterior half strongly broadened. Aedeagus as in figs **2994, 2995**. Length 4.5–5.2 mm. Described from Kirghyzstan ..... (s. str.) ***shnitnikovi*** JACOBSON, 1926.
- 56. Length of body about 8.0 mm. Uncertain species described based on one immature female from Mongolia ..... (s. str.) ***dubeshkoe*** MEDVEDEV, 1977.
- Length of body under 6.5 mm ..... **57.**
- 57. Legs and antennae black, rarely brown with basal part of femora and tibiae blackish ..... **58.**
- Legs and basal part of antennae rusty-brownish. Shining, black with bronzy reflex, elytra with weak greenish or bluish reflex. Puncturation of pronotum strong and

- rugulose only on lateral parts of surface. Aedeagus as in figs **2996, 2997**. Length 5.3–6.0 mm. Described from Kirghyzstan ..... (s. str.) ***pedaschenkoi*** JACOBSON, 1926.
58. Pronotum on whole surface covered by strong, relatively dense, rugose puncturation. Aedeagus not studied. Length 5.4–6.4 mm. Described from Kirghyzstan (vicinity of lake Son-Kul) ..... (s. str.) ***heydeni*** (WEISE, 1885).
- . Puncturation of pronotum in anterior half strong, uniform but not densely and not very uniformly scattered, in hind part, more dense and somewhat differentiated. Aedeagus as in figs **2998, 2999**. Length 4.8–5.8 mm. Described from Kirghyzstan (Susamyr) ..... (s. str.) ***montivaga*** LOPATIN, 1987.



Figs 2994-2999. Aedeagus in dorsal and lateral view (2998, 2999 after LOPATIN 1987, remaining after LOPATIN 1977): 2994, 2995 – *Oreomela (Oreomela) shnitnikovi*; 2996, 2997 – *O. (O.) pedaschenkoi*; 2998, 2999 – *O. (O.) montivaga*.

Genus ***Oreothassa*** JACOBSON, 1901

One species only. Body blue-black, legs and antennae black or blackish, lateral borders of elytra orange or rusty-red. Upper side covered by fine reticulation, feebly shining. Hind wings absent or strongly shortened, humeral calli absent, general outline of body elongate, parallel. General view as in plate LXXII, **phot. 645**. Length 3.3–4.0 mm. Distributed in W Siberia (Gornaya Shoriya) ..... ***martjanowi*** JACOBSON, 1901.

Genus ***Paropsides*** MOTSCHULSKY, 1860

*Paropsis auctorum*

Genus *Paropsides* MOTSCHULSKY, considered by some authors as subgenus of *Gonioctena* (p. 549) contains about 25 species distributed in Palaetropical superregion, mainly in Oriental region. In the discussed area two species.

Key to species

1. Pronotum pale usually with 2 large black spots, more rarely with two additional smaller spots or unicolorous. On each elytron 3 or 4 longitudinal stripes black, rarely whole upper side pale. General view as in plate 72, **phot. 646**. Body large, length 10.5–12.5 mm. Distributed in S China and in Korea ..... **nigrofasciatus** JACOBY, 1888.
- . Pronotum pale with 3 black spots, uniformly black, black with pale anterior margin or black with pale markings. Very variable, forms numerous aberrations and local races, sometimes considered as subspecies: pronotum black except for lateral and anterior margins and median line; elytra pale with black sutural stripe and one spot laterally on each (ab. *suturalis* CHEN, 1934 from China), pronotum black with two yellow spots; elytra black, each with four (2, 1, 1) yellow spots (ab. *maculicollis* JACOBY, 1890), pronotum black without pale spots, elytra black with yellow spots arranged in four (2, 2, 1, 1) band on each (typical form, as typical form, but yellow spots on each elytron arranged in three (2, 2, 1) bands (ab. *decempustulata* CHEN, 1934 from S China), as typical form, but on each elytron three (1, 1, 1) spots only (ab. *sexmaculata* REINECK, 1922). Pale forms with 3 black spots on pronotum are considered as subspecies *hieroglyphicus* GEBLER, 1825, with two aberrations: on each elytron sixteen (5, 5, 5, 1) often partly fused black spots (*hieroglyphicus*, typical form, General view as in plate 72, **phot. 647**), on each elytron eleven (4, 3, 3, 1) mostly free black spots (ab. *melli* REINECK, 1922). Length 7.0–10.0 mm. Distributed in Mongolia, E Siberia, Korea, Japan, China, N Indochina and Taiwan ..... **soriculatus** (SWARTZ, 1808).

Genus **Phaedon** DAHL, 1823

Literature: DACCORDI 1993.

Genus *Phaedon* DAHL sensu lato comprises almost 50 species, distributed in Palaearctica, Oriental and Neotropical regions. In discussed area 9 species.

Key to subgenera

1. Tarsi narrow, in female with bare stripe along middle, lobi of tarsomere 3 narrowly rounded ..... **Hemiphaedon** (p. 596).
- . Tarsi broader, in both sexes covered by short setae, lobi of tarsomere 3 broadly rounded ..... **2**.
2. Humeral callus distinct, on the inner side limited by a impression or a shallow furrow ..... **Phaedon** (p. 598).
- . Humeral callus very feebly pronounced, on the inner side not limited by a impression or furrow ..... **Paraphaedon** (p. 597).

Subgenus **Hemiphaedon** JACOBSON, 1901

Here belong two Transcaspian species.

Key to species

1. Length of body over 5.0 mm. Upper side dark green with feeble violaceous reflex. Labrum, antennomeres 6–11 and tarsi black, claws yellow, blackened at base.

Primary puncturation of elytra fine and dense, arranged in regular rows. Described from vicinity of Aral Sea in Kazakhstan, based on one specimen only (sex not determined) ..... **magnificus** LOPATIN, 1985.

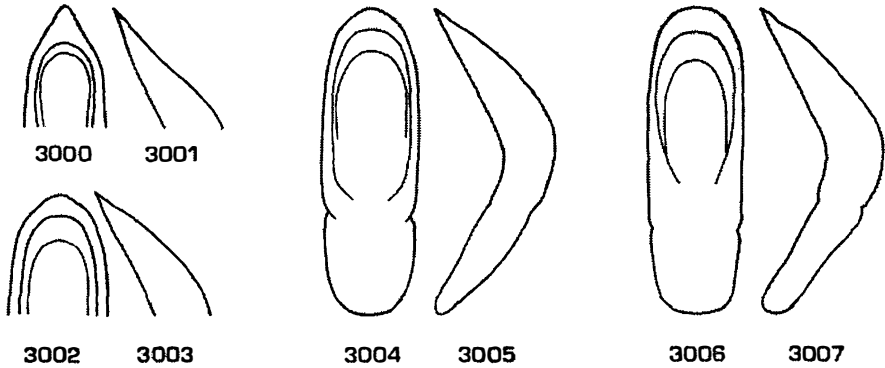
- Length of body at most 4.0 mm. Upper side dark green, dark blue or violaceous, sometimes with golden or bronzy reflex. Length 3.2–4.0 mm. Forms two subspecies: ground of elytral intervals matt, covered by small ridges and very small punctures (subsp. *opacus* LOPATIN, 1976 from SE Kazakhstan), ground of elytral intervals shining (nominotypical subspecies, distributed in remaining part of Kazakhstan, Usbekistan, Tadzhikistan and Kirgisia) ..... **subtilis** (JACOBSON, 1901).

Subgenus **Paraphaedon** SHARP, 1910

To the subgenus *Paraphaedon* belong two species.

Key to species

1. Body oval, humeral callus entirely absent, tough hind wings are normally developed. Upper side black, shining, with feeble metallic (bronzy, cupreous, greenish, bluish, violaceous) reflex. Tarsi and antennae pitchy brown. Central part of pronotum smooth and strongly shining, entirely without any punctures. Aedeagus as in figs **3000**, **3001**. Length 3.2–3.9 mm (= *ignitus* REICHE, 1864). On *Apiaceae* (*Heracleum*, *Anthriscus*). Distributed in The British Isles and locally in southern France ..... **tumidulus** (GERMAR, 1824).
- Body somewhat more broad, colouration of upper side as in *tumidulus* (thesis 1). Antennae brown, tarsi relatively pale, rusty-red. Central part of pronotum covered by dense, extremely fine punctures, feebly shining. Length 3.2–3.9 mm. Endemic to Canary Islands ..... **menthae** WOLLASTON, 1864.



Figs 3000-3007. Aedeagus or its apical part in dorsal and lateral view (after WARCHAŁOWSKI 1994): 3000, 3001 – *Phaedon* (*Paraphaedon*) *tumidulus*; 3002, 3003 – *P.* (*Phaedon*) *laevigatus*; 3004, 3005 – *P.* (*P.*) *cochleariae*; 3006, 3007 – *P.* (*P.*) *concinus*.

Subgenus *Phaedon* s. str.

In the discussed area occur 5 species.

Key to species

1. Body almost always shorter than 3.0 mm, very short-oval, almost hemispherical. Elytra very finely punctured, external (ninth) row indistinct. Upper side cupreous or bronzy. Aedeagus as in figs **3002, 3003**. Length 2.6–3.1 mm (= *gramicus* DUFTSCHMID, 1825, *sabulicola* SUFFRIAN, 1851). Variations: metallic sheen of upper side stronger, black, with cupreous or violaceous reflex (ab. *violaceus* WEISE, 1884), metallic sheen of upper side bronzy or greenish, primary punctures of elytra very fine, hardly visible (ab. ?subsp. *caucasicus* WEISE, 1884 occurring in Caucasus). Distributed in southern part of Central Europe, northern Italy, Croatia, Bulgaria, Ukraine and Caucasian countries ..... ***laevigatus*** (DUFTSCHMID, 1825).
- . Length of body at least 3.0 mm, his outline not very short-oval. Elytra not particularly finely punctured, ninth row fine, but distinct. Upper side usually blackish blue or blackish green, rarely bronzy ..... **2.**
2. Underside of the second and third antennomeres reddish or at least with a small red spot. General view as in plate LXXII, **phot. 648**. Aedeagus as in figs **3004, 3005**. Length 3.1–3.5 mm (= *egenus* GYLLENHAL, 1827, *omissus* SAHLBERG, 1838, *galeopsis* LETZNER, 1849, *grammicus*, SUFFRIAN, 1851, *regnianum*, 1941). Variations: upperside dark blue or blue with a feeble, greenish reflex (typical form), upper side green or green with bronzy reflex (ab. *neglectus* SAHLBERG, 1838), upper side black with very feeble bronzy reflex (ab. *hederae* SUFFRIAN, 1851), body on average greater, upper side strongly shining, secondary punctures of elytra very fine or almost disappearing (ab. *obesus* WEISE, 1884). Distributed in almost all Europe, Asia Minor, Caucasian countries and Central Asia ..... ***cochleariae*** (FABRICIUS, 1792).
- . Antennae entirely black ..... **3.**
3. Humeral callus feebly developed. Elytra strongly shining, usually greenish-blue, often with golden, purplish or violaceous reflex. Anal sternite usually entirely black. Apex of aedeagus broadly rounded (figs **3006, 3007**). Length 3.2–3.8 mm (= *commutatus* KONTKANEN, 1933, *contemptus* KONTKANEN, 1933). Halophil, distributed in northern and central part of Europe on coasts and salt marshes ..... ***concinnus*** STEPHENS, 1831.
- . Humeral callus rather distinct, on the inner side limited by a little impression. Elytra not particularly strongly shining, usually blue-black. Anal sternite broadly yellowish margined. Apex of aedeagus forms a rounded angle (figs **3008, 3009**) .... **4.**
4. On average larger. Length of body 3.6–4.7 mm (= *betulae* KÜSTER, 1846). On *Scrophulariaceae*, usually on *Veronica anagallis* L. Distributed in almost all Europe, Asia Minor, Caucasian countries and Central Asia to Transbaikalia ..... ***armoraciae*** (LINNAEUS, 1758).
- . On average smaller. Length 3.0–3.7 mm. In all morphological characters similar to *armoraciae* (thesis 4), considered as distinct species, but probably a local form of *armoraciae*, distributed in Alps and Pyrenees only ..... ***salicinus*** (HEER, 1845).



Genus *Phola* WEISE, 1890

To genus *Phola* WEISE belong representatives of Oriental and Australian fauna. In discussed area one species. Body elongate, upper side feebly shining. Head, antennomeres 1–4, pronotum and legs dark yellow or orange, antennomeres 5–11 and scutellum black. On vertex a black spot. On pronotum two roundish, small, black spots, often additionally one spot before scutellum. Elytra chestnut-brown or pitchy, on each elytron apex and eight (2, 2, 2, 2) large roundish spots pale yellow. General view as in plate LXXIII, **phot. 649**. Length 5.0–6.0 mm (= *cybele* STÅL, 1860, *viticis* FAIRMAIRE, 1888, *keyserlingi* WEISE, 1890). Distributed in India, China, Indochina, Indonesia, Philippines and New Guinea, known also from Japan (Kyushu) ..... *octodecimguttata* (FABRICIUS, 1775).

Genus *Phratora* CHEVROLAT, 1837

Genus *Phratora* CHEVROLAT (= *Phyllodecta* KIRBY, 1837) contains about 20 species distributed in Palaearctic and partly in Oriental area. One species (*vulgatissima* LINNAEUS) encroaches also in Alaska.

Key to subgenera

1. Second antennomere distinctly shorter than the third. Pubescence of all antennomeres uniform, rather short ..... *Phratora* s. str. (p. 599).
- . Second and third antennomeres subequal. Pubescence of antennomeres 4–6, particularly in male, longer, bristle-like ..... *Chaetoceroides* (p. 599).

Subgenus *Chaetoceroides* STRAND, 1935

One species only. Colouration and sculpture of upper side as in remaining species of the genus *Phratora*. Body slender, as *intibialis* (thesis 1). Aedeagus as in figs **3022**, **3023**. Length 4.3–5.6 mm. Transpalaearctic species, distributed from The British Isles to Kamchatka and Ussuri area. E Palaearctic populations often considered as a distinct subspecies (subsp. *obtusicollis* MOTSCHULSKY, 1860 = *inhonesta* WEISE, 1884, *longula* CHŪJŌ, 1959) ..... *vulgatissima* (LINNAEUS, 1758).

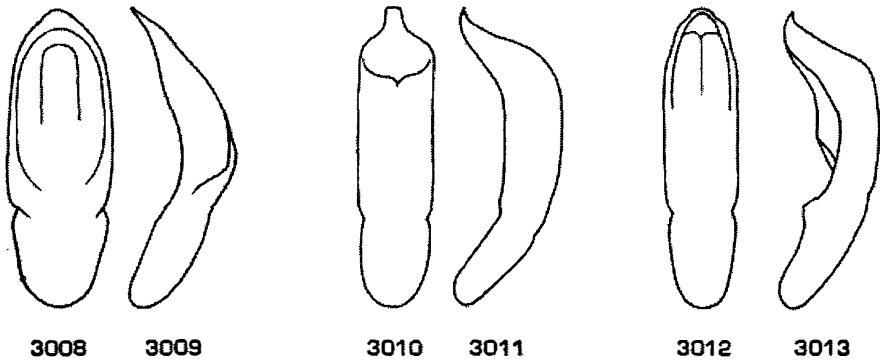
Subgenus *Phratora* s. str.

Key to species

1. In male first tarsomere of all legs strongly enlarged, as broad as the third. In female first tarsomere of hind tarsi 2 × longer than the second. In both sexes major part of fourth tarsomere free. Tibiae and tarsi often entirely or partly reddish. General view as in plate LXXIII, **phot. 650**. Aedeagus as in figs **3010**, **3011**. Length 4.7–5.9 mm. Variations: upper side black green, tibiae reddish (typical form), upper side pure deep blue or blue-violaceous, tibiae reddish (ab. *coerulea* WEISE, 1884),

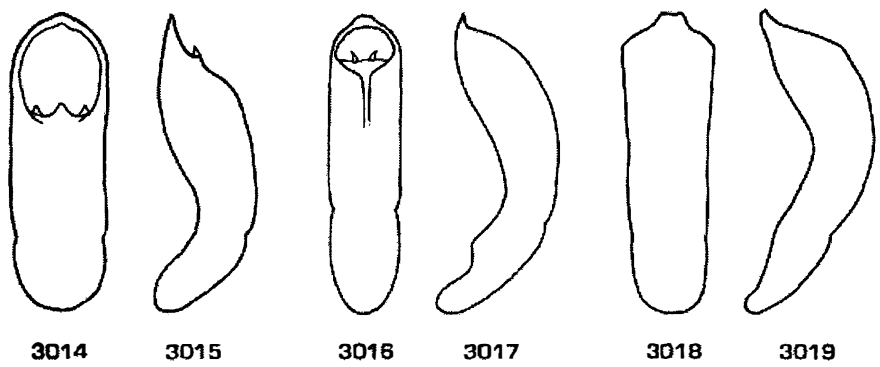
tibiae black with metallic sheen (ab. *cornellii* WEISE, 1882). Distributed in European area of mixed forests, from north-western Spain to Bulgaria and from Belgium to basin of Don. Reported also from Turkey ..... **tibialis** (SUFFRIAN, 1851).

- In male first tarsomere of all legs narrower than the third. In female first tarsomere of hind tarsi at most 1.5 × longer than the second. In both sexes at most a half of fourth tarsomere free (fig. 1801). Tibiae and tarsi always entirely black with metallic reflex ..... **2.**



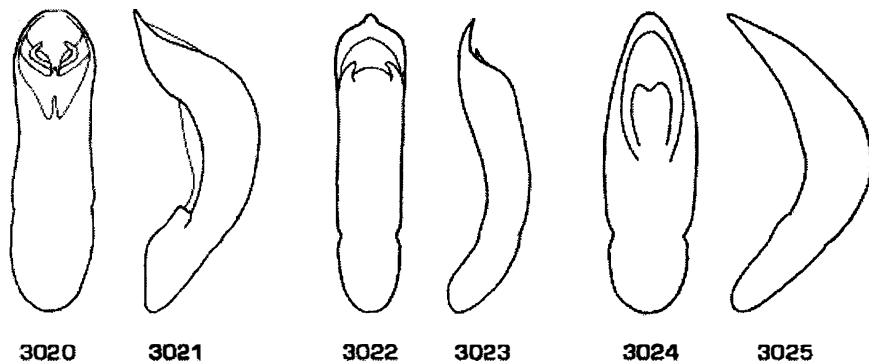
Figs 3008-3013. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1994): 3008, 3009 – *Phaedon (Phaedon) armoraciae*; 3010, 3011 – *Phratora (Phratora) tibialis*; 3012, 3013 – *P. (P.) laticollis*.

- 2. Frons divided into two convexities by median impression or a shallow furrow ... **3.**
- Frons not divided into two convexities ..... **4.**



Figs 3014-3019. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1994): 1014, 3015 – *Phratora (Phratora) atrovirens*; 3016, 3017 – *Phratora (Phratora) vitellinae*; 3018, 3019 – *P. (P.) polaris*.

3. Antennae relatively long, reaching slightly beyond the middle of body. Aedeagus as in figs **3012**, **3013**. Length 3.6–4.9 mm (= *cavifrons* THOMSON, 1866, *multi-punctata* JACOBY, 1890, here probably also *sinensis* CHEN, 1934, described from Kansu). Elytra rarely with purplish reflex: ab. *purpurascens* PIC, 1925. On elytra intervals shining, secondary punctures sparsely scattered. Transpalearctic species, distributed from Ireland to Japan ..... ***laticollis*** SUFFRIAN, 1851.
- . Antennae somewhat shorter, in male reaching hardly to the middle of body. Secondary punctures on intervals of elytra distinct, in hind part almost as strong as primary punctures. Length 3.6–4.2 mm. Described from Korea ... ***koreana*** TAKIZAWA, 1985.
4. Body outline more broadly oval, resembling to some species of *Phaedon* (p. 598). Length 4.0 mm. Insufficiently described species based on one specimen (sex not determined) from N China (Beijing) ..... ***phaedonoides*** CHEN, 1934.
- . Body outline more elongate, subparallel ..... **5**.
5. Body length under 3.3 mm. Apical sides of aedeagus gently rounded. Described from N China, sometimes wrongly considered as conspecifics with *polaris* (thesis 8) ..... ***parva*** GRESSIT et KIMOTO, 1961.
- . Body length over 3.5 mm ..... **6**.
6. Claws tooth small (fig. **1803**). Third tarsomere over 2 × broader than the second, fourth tarsomere relatively short (fig. **1802**). Aedeagus as in figs **3014**, **3015**. Length 3.5–4.2 mm. Distributed in Alps, Fennoscandia, Germany, Poland and Russia to north-eastern Asia ..... ***atrovirens*** (CORNELIUS, 1857).
- . Claws tooth large. Third tarsomere narrower, fourth tarsomere longer. Here three species, very similar to each other, distinguishable by aedeagus form ..... **7**.



Figs 3020–3025. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1994): 3020, 3021 – *Phratora* (*Phratora*) *horioni*; 3022, 3023 – *P. (Chaetoceroidea) vulgatissima*; 3024, 3025 – *Sternoplatys segnis*.

7. Species common in Central Europa and in the most part of Palaearctic region. Metallic sheen of upper side green or bluish, rarely bronzy. Aedeagus as in figs **3016**, **3017**. Length 3.8–5.1 mm (= *angusticollis* MOTSCHULSKY, 1860, *latipennis* MOTSCHULSKY, 1860). Variations: upper side as in description (typical form), pronotum greenish black, elytra blue or blue-violaceous (ab. *brevicollis* MOTSCHULSKY, 1860), metallic

- reflex of upper side very feeble or absent (ab. *nigrica* MOTSCHULSKY, 1860). One subspecies was described: 6<sup>th</sup> interval of elytron elevate, shining, costiform (subsp. *grandis* CHŪJŌ, 1956 occurring in Japan). Transpalaeartic species, distributed from Ireland and Pyrenees to Kamchatka and Japan ..... *vitellinae* (LINNAEUS, 1758).
- . Species not occurring in Central Europe ..... **8**.
  - 8. A subpolar species. Upper side usually bronzy black. Length 3.5–4.0 mm. Aedeagus as in figs **3018**, **3019**. Distributed in Fennoscandia and northern Siberia ..... *polaris* (SCHNEIDER, 1886).
  - . Species from Asia Minor and Caucasian countries. Length 4.2–4.9 mm. Distributed as above ..... *horioni* (MOHR, 1968).

### Genus *Plagiodera* CHEVROLAT, 1837

A cosmopolitan genus, containing about 100 species distributed mainly in S America. In discussed area two species only.

#### Key to species

1. On elytra submarginal row of punctures confuse. Head black, all borders of pronotum and lateral borders of elytra brown-red, disc of pronotum black, disc of elytra blackish with green metallic reflex. Length 4.0–4.8 mm. Described from N China (Kansu), perhaps conspecific with *versicolora* (antithesis 1) ... *bicolor* WEISE, 1889.
- . On elytra submarginal row of punctures regular. Body relatively broad, a little flattened. Upper side black, usually with blue-green, sometimes green or violaceous metallic sheen, underside blue black. General view as in plate LXXIII, **phot. 651**. Length 2.5–4.5 mm (nominotypical subspecies = *similis* HERBST, 1783, *salicis* PANZER, 1795). Variations: upper side particularly fine punctured, strongly shining (ab. *clavicornis* STEPHENS, 1831), lateral sides of pronotum strongly convergent anteriorly (subsp. *laevicollis* LOPATIN, 1962, perhaps an abnormality, described from N China). In eastern part of distribution area a few colour variation, partly considered as subspecies: body entirely reddish-ochraceous except for dark coloured antennomeres 8–11 (subsp. *borealis* GRESSIT et KIMOTO, 1961, described from the province Liaoning in NE China), body coloured as in *borealis*, but disc of elytra darkened with metallic reflex (ab. *coelestina* BALY, 1864), head blackish, pronotum reddish, elytra metallic blue-green (ab. *rufithorax* CHEN, 1934 described from S China), head and pronotum reddish, elytra metallic green-blue (ab. *orientalis* CHEN, 1934, described from N and S China). Lives on various *Salix* and *Populus*-species. Very widely distributed in almost entire Holarctic superregion as well as (probably introduced with decorative and industrial willows) in Pakistan and Taiwan .... *versicolora* (LAICHARTING, 1781).

### Genus *Potaninia* WEISE, 1899

Genus *Potaninia* WEISE includes five species distributed in SE Asia; of these two occur in the discussed area.

Key to species

1. Primary punctures on elytra randomly scattered, arranged subregularly at sides only. Length about 5.0 mm. Distributed in S China, reported also from N Sikang ...  
..... **laboissierei** CHEN, 1931.
- . Primary punctures on elytra arranged in regular rows. Length 4.8–6.4 mm. Distributed in Japan (Honshu, Shikoku, Kyushu) and in Korea .....  
..... **cyrtonoides** (JACOBY, 1885).

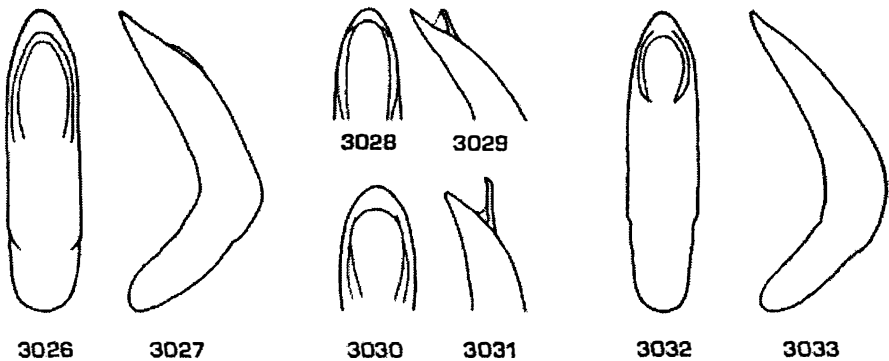
Genus **Prasocuris** LATREILLE, 1802

Genus *Prasocuris* LATREILLE contains about 10 species distributed in Holarctic superregion; one of these species, described from S Africa, probably not congeneric. In discussed area four species.

♂

Key to species

1. Upper side bicolorous ..... **2.**
- . Upper side uniformly black with metallic (blue, green or rarely bronzy) sheen .... **3.**
2. Body longer (5.0–6.0 mm). On pronotum dark median stripe in the middle or behind the middle broadened. Elytron yellow with two (sutural and median) longitudinal black stripes with feeble bronzy reflex. General view as in plate LXXIII, **phot. 653**. Aedeagus as in figs **3026, 3027**. Length 5.0–6.0 mm (= *weisei* REITTER, 1901). Variations: on elytron yellow median stripe shortened or interrupted (ab. *sii* WEISE, 1883), on elytron yellow median stripe absent (ab. *cicutae* WEISE, 1883). On *Apiaceae* (*Oenanthe*, *Sium*, *Cicuta*, *Berula* etc.). Transpalaeartical species, distributed in almost whole Europe, northern part of Asia Minor, Mongolia and Siberia ...  
..... **phellandrii** (LINNAEUS, 1758).
- . Body smaller (3.6–5.0 mm) ..... **2a.**



Figs 3026-3033. Aedeagus or its apical part in dorsal and lateral view (after WARCHAŁOWSKI 1994): 3026, 3027 – *Prasocuris phellandrii*; 3028, 3029 – *P. distincta*; 3030, 3031 – *P. vicina*; 3032, 3033 – *P. junci*.

3. Length of body over 4.0 mm. On pronotum dark median stripe with parallel sides. Elytra variously coloured. General view as in plate LXXIII, **phot. 652**. Aedeagus not characteristic (figs **3028, 3029**). Length 4.0–5.0 mm (= *marginicollis* SUFFRIAN, 1851). Variations: elytra uniformly black with blue or green metallic reflex (typical form), dark median stripe on pronotum strongly reduced, lateral margins of elytra narrowly reddish (ab. *pallidithorax* PIC, 1901), elytra yellow with dark sutural stripe (ab. *suturella* REICHE, 1858), elytra entirely yellow (ab. *insuturella* PIC, 1913). On hygrophil *Veronica*-species (*Scrophulariaceae*). Pale variations occur mainly in Eastern part of distribution area. Distributed in North Africa, Sicily, Lebanon, Israel and Syria ..... **distincta** (LUCAS, 1849).
- . Length of body under 4.0 mm. On pronotum dark median stripe behind the middle broadened, remaining characters also as in *phellandrii* (thesis 1). Length 3.65 mm. Described based on one male only, from NW China (Kharbin) ..... **gressitti** DACCORDI et GRUEV, 1991.
4. Abdomen and pygidium entirely brown or blackish. Upper side black with metallic reflex (green, blue or rarely violaceous). Operculum distinctly deflected (aedeagus as in figs **3030, 3031**). Length 3.9–5.2 mm (= *litigiosa* ROSENHAUER, 1856). Variations: metallic reflex green or blue (typical form), metallic reflex steel-blue (ab. *chalybaea* SUFFRIAN, 1851), lateral sides of pronotum rounded stronger than usually, elytra in the middle of their length slightly broadened (ab. *hispanica* WEISE, 1884). On hygrophil *Veronica*-species (*Scrophulariaceae*). Distributed in north-western Africa, Corsica, Sardinia, Sicily and southern Italy. Reports from Morocco and southern Spain were not confirmed since the end of the 19. century ..... **vicina** LUCAS, 1849.
- . Apex of abdomen usually and pygidium always yellow or orange. Upper side black with metallic reflex (green or blue). Operculum shorter and feebly deflected (aedeagus as in figs **3032, 3033**). Length 4.5–5.3 mm (= *beccabungae* ILLIGER, 1794, *violacea* FABRICIUS, 1792 nec OLIVIER, 1790, ). Variations: upper side pure black, without metallic reflex (ab. *atra* DUFTSCHMID, 1825), upper side greenish-olivaceous (ab. *olivaceus* PIC, 1934). On hygrophil *Veronica*-species (*Scrophulariaceae*). Distributed in western, central and southern parts of Europe, Turkey, Caucasian countries and S Kazakhstan ..... **junci** (BRAHM, 1790).

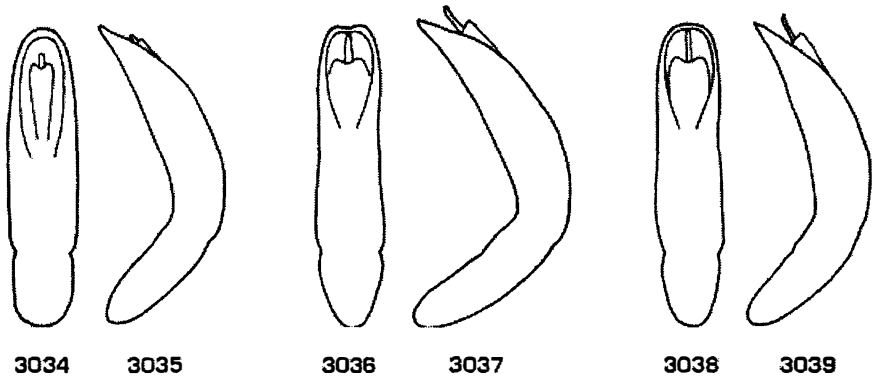
### Genus *Sclerophaedon* WEISE, 1882

The genus *Sclerophaedon* WEISE contains three species distributed in European mountains.

#### Key to species

1. Pronotum more than twice broader than long. Prosternum finely punctate, on prosternal process a few strong punctures only. Body broad. Upper side black with bronzy or bronzy-green reflex. Aedeagus as in figs **3034, 3035**. Length 3.5–4.0 mm. Distributed in Alps and in southern part of Germany .... **orbicularis** (SUFFRIAN, 1851).
- . Pronotum at most twice broader than long. Prosternum strongly punctured on whole surface ..... **2.**

2. Body shorter, 3.2–3.8 mm (male) to 3.6–4.3 mm (female). Pronotum twice broader than long. Elytra always reticulate. Apex of aedeagus slightly emarginate (figs **3036**, **3037**) (= *transsylvanicus* FUSC, 1861). Variation: metallic reflex on elytra a little stronger, blue or violaceous (ab. *obscurus* WEISE, 1884). On *Caryophyllaceae* (*Malachium*, *Stellaria*). Distributed in Carpathians, Dinaric Alps, Eastern Alps as well as in the Sudetes, Erzgebirge, Böhmerwald, Schwarzwald and Harz ..... ***carniolicus*** (GERMAR, 1824).
- . Body longer, 3.7–4.5 mm (male) to 4.2–5.0 mm (female). Pronotum less than twice broader than long. General view as in plate LXXIII, **phot. 655**. Apex of aedeagus not emarginate (figs **3038**, **3039**). Elytra distinctly reticulate in immature specimens only (= *kenderesyi* KIESENWETTER, 1879). Distributed in Eastern Carpathians ..... ***carpathicus*** (WEISE, 1875).



Figs 3034–3039. Aedeagus in dorsal and lateral view (after WARCHAŁOWSKI 1994): 3034, 3035 – *Sclerophadon orbicularis*; 3036, 3037 – *S. carniolicus*; 3038, 3039 – *S. carpathicus*.

Genus ***Semenovia*** WEISE, 1889

One species only. On pronotum lateral thickenings distinct, separated by deep furrow, hind angles slightly prolonged at humeral calli. Body black, upper side with weak golden reflex. Externally resembles somewhat *Chrysolina marginata*. Length 6.5 mm. Described from NE Tibet (Amdo) ..... ***chalcea*** WEISE, 1889.

Genus ***Sternoplatys*** MOTSCHULSKY, 1860

The genus *Sternoplatys* MOTSCHULSKY contains one European species and three species distributed in Asia.

Key to species

1. Species from C Asiatic mountains (Tian-Shan, Alai, Pamir). Outline of body slightly elongate, upper side alutaceous, feebly shining. Hind wings absent. On pronotum two small and shallow roundish impressions. Body entirely blue-black with very feeble greenish hue. Length 3.5–3.8 mm. Distributed as above, often separated as a distinct subgenus *Australosternoplatys* JACOBSON, 1921 ..... **longulus** (WEISE, 1890).
- . Species from other regions. On pronotum no small, roundish impressions .... 2.
2. European species. Upper side black with rather feeble metallic reflex, usually blue-black or dark bronzy-greenish. Tarsi and basal part of antennae reddish, remaining parts of antennae and legs brown. Humeral callus absent, hind wings shortened. Length 3.1–4.0 mm (= *tatricus* MARSEUL, 1889, *szmolanyi* MARSEUL, 1889). Variation: elytra rather matt, primary punctures finer, rows a little undulate, secondary punctures stronger (ab. *obscurus* WEISE, 1884). From southern Carpathians were also described *P. (S.) deubeli* WEISE, 1900, externally similar, with aedeagus as broad as in *segnis*, but two times shorter; perhaps a teratological form. Lives on *Caryophyllaceae* (*Malachium*, *Stellaria*). Mountain species, distributed in Carpathian, Alps and Dinaric Alps ..... **segnis** WEISE, 1884.
- . Species from Mongolia, E Siberia and N China ..... 3.
3. Antennae entirely black or (basally) black with feeble metallic reflex, legs black or pitchy-black. Upper side finely reticulate, feebly shining. Length 3.0–3.6 mm (= *tolli* JACOBSON, 1901, *weisei* REITTER, 1901, *weisei* CSIKI, 1901). Distributed in Altai, Mongolia and E Siberia ..... **clementzi** JACOBSON, 1901.
- . Antennae and legs at least partly pale ..... 4.
4. Basal antennomere rusty-red, legs dark yellow. On elytron interval 3 distinctly broader than intervals 2 or 4. Length 3.0–3.5 mm. Variation: on elytra ultimate row of punctures distinct, consisting of 4–11 punctures (ab. *completa* JACOBSON, 1901). Distributed in E Siberia (Magadan Distr., Ussuria) ..... **fausti** WEISE, 1884.
- . Basal antennomere black with metallic reflex. On elytron interval 3 not distinctly broader than intervals 2 or 4. Length 3.2–4.0 mm. Forms two subspecies: legs pale, rusty-yellow (nominotypical subspecies, distributed in Ussuria and NE China), legs brown (subsp. *baicalicus* WEISE, 1900 = *piceipes* JACOBSON, 1901, distributed in Transbaicalia and western part of basin of Amur) .... **fulvipes** MOTSCHULSKY, 1860.

Genus *Timarchida* GANGLBAUER, 1897

One species only. Body very short, broad and convex, entirely pitchy brown or pitchy black, without metallic reflex; legs and antennae brown or reddish-brown. Pronotum finely punctured, elytral punctures moderately strong. General view as in plate LXXIII, **phot. 655**. Length 6.2–8.0 mm (= *flecki* REITTER, 1912). Endemic to Southern Carpathians ..... **deubeli** GANGLBAUER, 1897.



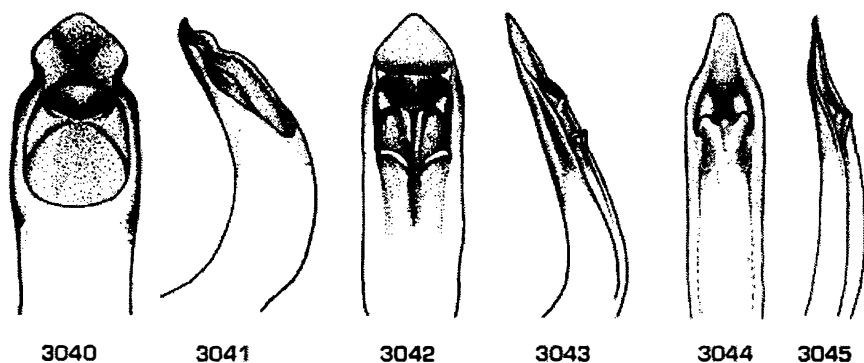
Genus *Xenomela* WEISE, 1884

Literature: LOPATIN 1989.

The genus *Xenomela* contains 11 species distributed in the mountains belonging to Tien-Shan Range.

Key to species

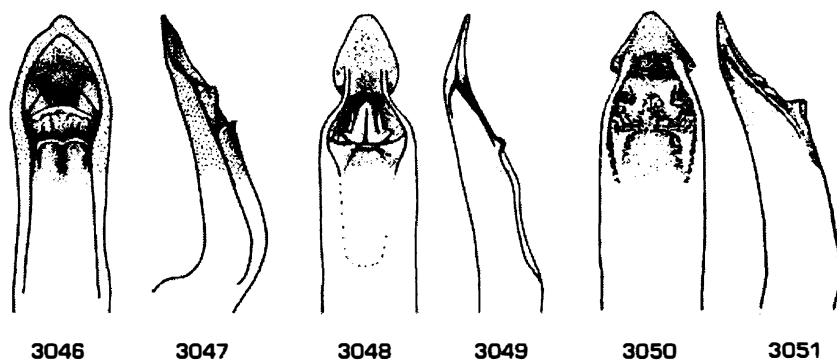
1. Elytra unicolorous, without reddish bordering. Aedeagus (figs **3040**, **3041**) constricted before apex. Length 5.4–6.0 mm (= *ovipennis* BALLION, 1878, *fulvipes* BALLION, 1878). Distributed in E Kazakhstan and NW China ..... *marginicollis* (BALLION, 1878).
- . Elytra with red or reddish lateral bordering ..... **2.**



Figs 3040-3045. Tubular part of aedeagus in dorsal and lateral view (after LOPATIN 1989): 3040, 3041 – *Xenomela marginicollis*; 3042, 3043 – *X. laevigata*; 3044, 3045 – *X. dohrni*.

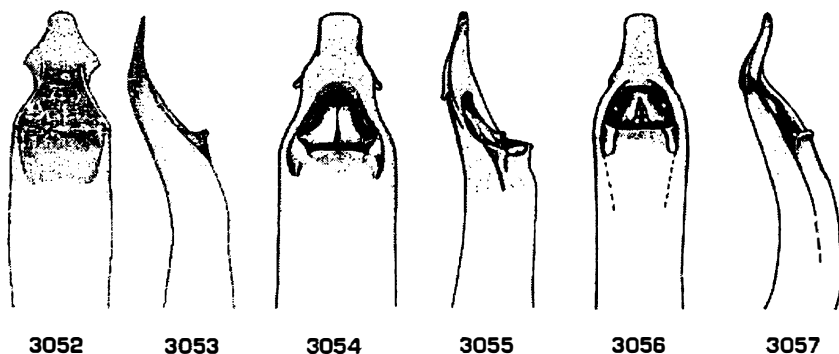
2. Juxtascutellar reddish spots free or very narrowly fused with red lateralstripes .... **3.**
- . Anterior and lateral bordering of elytra continuous or only slightly narrowed near humeral calli, its juxtascutellar part never free or distinctly separated ..... **5.**
3. Body smaller, puncturation of upper side fine and shallow. Legs black. Aedeagus as in figs **3042**, **3043**. Length 5.7–6.7 mm. Distributed in SE Kazakhstan ..... *laevigata* LOPATIN, 1989.
- . Body larger, puncturation of upper side stronger, on elytra usually somewhat rugose. Legs black or reddish ..... **4.**
4. Lateral sides of pronotum gently rounded. Aedeagus as in figs **3044**, **3045**. Length 7.0–7.5 mm. Distributed in SE Kazakhstan ..... *dohrni* (SOLSKY, 1881).
- . Lateral sides of pronotum more distinctly rounded. General view as in plate LXXIII, **phot. 656**. Aedeagus as in figs **3046**, **3047**. Length 6.9–7.0 mm. Distributed in SE Kazakhstan ..... *kraatzi* WEISE, 1884.
5. Puncturation of upper side moderately strong, punctures on elytra not joined by fine scrapes or rugosities. Aedeagus as in figs **3048**, **3049**. Length 7.8 mm. Female unknown. Described from Kirghyzskiy Alatau mountains .... *ballioni* LOPATIN, 1989.

- Punctuation of upper side strong, punctures on elytra at least partly joined by fine scrapes or rugosities. Six species (*regeli*-group), externally similar to each other, distinguishable by shape of aedeagus ..... 6.
- 6. Apical part of aedeagus constricted at base, in dorsal view approximately triangular ..... 7.
- Apical part of aedeagus differently shaped ..... 8.



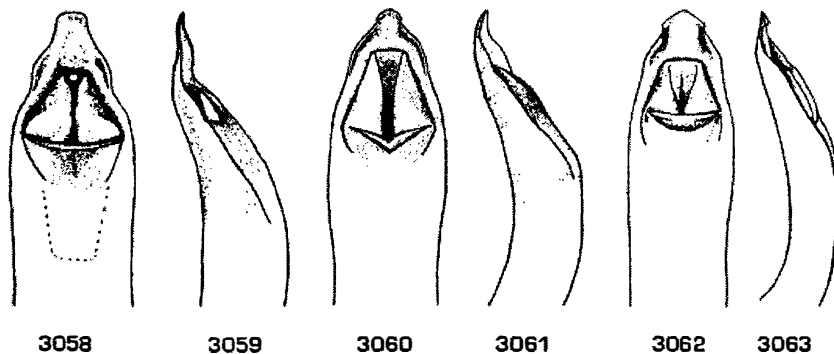
Figs 3046-3051. Tubular part of aedeagus in dorsal and lateral view (3050, 3051 after LOPATIN 1995, remaining after LOPATIN 1989): 3046, 3047 - *Xenomela kraatzi*; 3048, 3049 - *X. ballioni*; 3050, 3051 - *X. ovzinnikovi*.

- 7. Aedeagus as in figs 3050, 3051. Length of body 8.2-8.5 mm. Described from Kuraminskiy Khrebet mountains ..... **ovzinnikovi** LOPATIN, 1995.
- Aedeagus as in figs 3052, 3053. Length of body 8.3-8.5 mm. Described from E Uzbekistan, NE of Tashkent ..... **konstantinovi** LOPATIN, 1995.



Figs 3052-3057. Tubular part of aedeagus in dorsal and lateral view (3052, 3053 after LOPATIN 1995, remaining after LOPATIN 1989): 3052, 3053 - *Xenomela konstantinovi*; 3054, 3055 - *X. regeli*; 3056, 3057 - *X. karatavica*.

8. Length of body over 10.0 mm. Upper side feebly shining. Punctuation strong or coarse, interstices convex, covered by sparse, fine secondary punctures. Aedeagus as in figs **3054**, **3055**. Distributed in SE Kazakhstan (Tashkent region) ..... *regeli* JACOBSON, 1897.
- . Length of body 7.0–8.0 mm, in large females sometimes to almost 10.0 mm ..... **9**.
9. Apical part of aedeagus (figs **3056**, **3057**) at its base with two small teeth, somewhat similarly as in *regeli* (thesis 8). Body relatively small, length about 7.0 mm. Female unknown. Described from Karatau mountains, based on one male only ..... *karatavica* LOPATIN, 1989.
- . Apical part of aedeagus without tooth-like structures ..... **10**.



Figs 3058-3063. Tubular part of aedeagus in dorsal and lateral view (after LOPATIN 1989): 3058, 3059 – *Xenomela belousovi*; 3060, 3061 – *X. minckwitzae pskemica*; 3062, 3063 – *X. minckwitzae kreutzbergi*.

10. Apex of aedeagus formed as large lamella. Length 7.6–10.0 mm. Described from Tshatkal Range ..... *belousovi* LOPATIN, 1989.
- . Apex of aedeagus with a small lamella. Length 7.0–8.7 mm. General view as in plate LXXIII, **phot. 657**. Forms two subspecies with somewhat differently formed apex of aedeagus (subsp. *kreutzbergi* LOPATIN, 1989, figs **3062**, **3063**) and subsp. *pskemica* LOPATIN, 1989, figs **3060**, **3061**). Described from Talass Alatau mountains, the subspecies in Karzhantau and Pskem mountains ..... *minckwitzae* (JACOBSON, 1925).

### Genus *Zygogramma* CHEVROLAT, 1836

The genus *Zygogramma* contains numerous species distributed in America. One species has been introduced to Russia in 1978 by Dr. O.V. Kovalev against the common ragweed, *Ambrosia artemisiifolia*. Body brownish with bronzy or greenish hue. On elytron pale yellowish pattern consisting of longitudinal stripe on third interval, base and lateral border together with epipleura. Length 5.0–6.8 mm. Actually known from Balkan Peninsula, Ukraine, Circumcaspia, China and Russian Far East ..... *suturalis* (FABRICIUS, 1775).

## Tribe *Timarchini*

One genus only.

Genus *Timarcha* Latreille, 1829

The genus *Timarcha* grouping very many taxa of various ranks still requires a revision. The enormous local and individual variability of these insects resulted in description of about 240 species and subspecies at least 80% of which should, in my opinion, be reduced to infrasubspecific level. The key given below has been compiled mostly based on original descriptions and redescrptions, and then confronted and corrected according to W. STEINHAUSEN'S (in litt.) unpublished project. When identifying species the origin (locality of capture) of the specimens may be an important indication. The division into subgenera and species groups used here is that proposed by J. BECHYNÉ (1948) with later modifications.

### Key to subgenera

1. Marginal ridge on pronotum absent. Mesosternum flat, broad, transversely cut. Upper side normally with cupreous or bronzy sheen. Sexual dimorphism feebly pronounced ..... *Metallotimarcha* (p. 610).
- Marginal ridge on pronotum present. Mesosternum narrow, usually elevate, transversely cut, emarginate or forming two dentiform humps. Sexual dimorphism well pronounced ..... **2.**
2. Marginal ridge of elytra reaches middle of elytron length only, further formed as a broad fold. In male mid tibia longer than corresponding tarsi ..... *Timarcha* (p. 620)
- Marginal ridge of elytra longer, usually reaching apical part. In male mid tibia not longer (usually shorter) than corresponding tarsi ..... *Timarchostoma* (p. 611).

Subgenus *Metallotimarcha* MOTSCHULSKY, 1860

### Key to species

1. Pronotum widest at base, lateral sides almost straight, convergent anteriorly. Body very convex, length 8.0–12.0 mm. Distributed in eastern part of Alps and northern part of Dinaric Alps ..... *gibba* (HAGENBACH, 1825).
- Pronotum widest at middle or before middle ..... **2.**
2. Legs red or red-brown ..... **3.**
- Legs black or almost black, with metallic, usually violaceous sheen. Pronotum widest at middle. Length 8.5–13.0 mm. Distributed in Dinaric Alps and in south-western Carpathians. Variations: upper side greenish-bronzy or cupreous (typical form), upper side bluish or violaceous (ab. *bosnica* BECHYNÉ, 1948 = ab. *kodymi* BECHYNÉ, 1948). Forms two subspecies: larger (female 10.5–15.0 mm), elytra moderately densely punctate, in female matt (nominotypical subspecies from Bosnia, Dalmatia

- and Banat), smaller (female under 10.5 mm), elytra densely punctate, in both sexes shining (subsp. *albanica* APFELBECK, 1912, from Albania) .....  
 ..... **corinthia** FAIRMAIRE, 1873.
3. Species from mountains and foothills of Middle Europa and Balkans. General view as in plate LXXIV, **phot. 658**. Length 6.0–8.5 mm. Variations: pronotum broad and short (ab. *splendens* MATZEK, 1843), upper side almost black with bluish reflex (ab. *wendleri* FLEISCHER, 1909). Forms three subspecies: larger (female to 13.0 mm), body oblong (subsp. *portai* BECHYNÉ, 1954 from N Italy), smaller (female under 10.0 mm), body stout, upper side in both sexes matt (subsp. *thiemei* KUNTZEN, 1919, from south-western Alps), as *thiemei*, but upper side in both sexes shining (nominotypical subspecies from remaining area) .... **metallica** (LAICHARTING, 1781).
- . Species from mountains and foothills of Caucasus. Length 8.5–13.0 mm. Forms two subspecies: smaller (female under 11.0 mm), punctures of elytra moderately dense, upper side in female mat (nominotypical subspecies from eastern Caucasus and north-western Iran), larger (female 12.0–13.0 mm), punctures of elytra dense, upper side in both sexes shining (subsp. *starcki* BECHYNÉ, 1953, from eastern Caucasus, Armenia and Asia Minor) ..... **hummeli** FALDERMANN, 1837.

Subgenus **Timarchostoma** MOTSCHULSKY, 1860

Key to auxiliary groups

1. Pronotum rapidly constricted at base, marginal ridge does not reach posterior angle ..... **2**.
- . Pronotum before posterior angles sometimes mildly sinuate, but not rapidly constricted. Marginal ridge sometimes indistinct, but always present on whole length of lateral side ..... **4**.
2. Pronotum broad, laterally strongly rounded. Underside and legs with a feeble metallic reflex ..... **gravis**-group (p. 617).
- . Pronotum narrower, laterally feebly rounded. Underside and legs with distinct blue metallic sheen ..... **strangulata**-group (p. 616).
3. Last article of maxillar palpi in both sexes oval, not particularly broad, widest at the middle of length ..... **4**.
- . Last article of maxillar palpi broad, widest at apex or almost square ..... **7**.
4. Ground colour of pronotum reticulate, puncturation moderately strong or fine .... **6**.
- . Ground colour of pronotum smooth, puncturation strong and dense, sometimes partly confluent ..... **5**.
5. Legs entirely black ..... **perezi**-group (p. 614).
- . Legs partly red ..... **geniculata**-group (p. 614).
6. On pronotum longitudinal median line usually absent or strongly shortened, perceptible in basal part only ..... **lusitanica**-group (p. 615).
- . On pronotum longitudinal median line sometimes very thin, but always perceptible on whole length ..... **monticola**-group (p. 613).
7. Pronotum widest at basis, lateral sides, feebly rounded or almost straight, convergent anteriorly. Marginal ridge on the basis of pronotum in mid part interrupted ...  
 ..... **recticollis**-group (p. 613).

- . Pronotum widest in the middle or before middle of length. Marginal ridge on the basis of pronotum usually entire ..... **8.**
- 8. Punctures of pronotum loosely scattered, fine or very fine ..... *sardea*-group (p. 617).
- . Punctures of pronotum dense ..... **9.**
- 9. Pronotum short and broad, heartshaped. Elytral puncturation moderately dense, interstices rugosely elevate ..... *pratensis*-group (p. 616).
- . Pronotum only feebly heartshaped or with evenly rounded sides. Elytral puncturation very dense, in hind part sometimes wrinkled ..... *goettingensis*-group (p. 612).

### *goettingensis*-group

#### Key to species

1. Pronotum longer, elytra widest at the middle or just before. The species displays a very wide individual and local variation, which provided a basis for description of numerous local forms ranked mostly as subspecies. In France and in northern Spain occurs two forms moderately strongly punctured: form from northern France, smaller (female under 9.0 mm), upper side black, matt (subsp. *normanna* REICHE, 1872) and form from Pyrenees and Spain, larger (female over 10.0 mm), upper side shining (subsp. *monserratensis* BECHYNÉ, 1962). Remaining forms are strongly punctured: form from central France, body stout, elytra sometimes reddish (subsp. *semirufa* PIC, 1931), form from western and northern Italy, elytra very strong and densely punctate, interstices slightly convex (subsp. *fracassii* MEIER, 1900), form from northern France, body large (female to 13.0 mm), ground colour of elytra with strong blue, green or violaceous metallic sheen (subsp. *splendorifera* BECHYNÉ, 1946), form from Germany, Austria and Poland, upper side feebly shining, bluish-black, body more oblong (nominotypical subspecies), form from Czech Republic similar to *goettingensis* s. str., but punctures on anterior part of elytra partly confluent (morpha *duftschmidtii* BECHYNÉ, 1946), form from Slovakia and eastern Carpathians, elytra finely wrinkled, pronotum shining, upper side blue or violaceous (subsp. *carpathica* BECHYNÉ, 1946), form from southern Romania, as *carpathica*, but pronotum matt, body bluish-black (subsp. *mangaliana* BECHYNÉ, 1946), form from Balkan Peninsula, elytra bulbous (subsp. *aerea* HERRICH-SCHÄFFER, 1838), form from southern France, similar to *carpathica*, but upper side almost pure black (subsp. *gallica* FAIRMAIRE, 1873). Nominal taxa included at present in *T. goettingensis*, only a part of them being listed here, in the past changed their rank, were treated as synonyms or mutually subordinate entities in various combinations and included or excluded from others species. This resulted in an unbelievable chaos which is impossible to tackle without a detailed reconstruction of the history of studies. According to some authors the present classification is not functional and should be replaced with a simple description of variation. Distributed in S, W, and Central Europe, north to SW Poland and Roumania ... ..... *goettingensis* (LINNAEUS, 1758).
- . Pronotum broader and shorter, elytra widest at the middle or just behind. Puncturation of elytra strong or moderately strong ..... **2.**

2. Pronotum uniformly, rather loosely punctate. Upper side bronzy-brown. Length 10.0–13.0 mm. Forms two subspecies: ground of elytra in both sexes smooth, interstices flat (nominotypical subspecies from western Catalonia), ground of elytra in male shining, in female matt, interstices slightly wrinkled (subsp. *belchitensis* BECHYNÉ, 1962 described from Zaragoza). Known from Spain only ..... *catalaunensis* FAIRMAIRE, 1873.
- . Puncturation of pronotum dense, composed of larger and finer punctures ..... 3.
3. Lateral borders of pronotum sloping, lateral marginal ridge feebly visible. Length of female 12.0–14.0 mm. Distributed in south-western France and in Catalonia .... *affinis* LABOISSIÈRE, 1937.
- . Lateral borders of pronotum not sloping, lateral marginal ridge distinct ..... 4.
4. Pronotum somewhat widened in anterior part, slightly heartshaped, before posterior angles shortly sinuate. Distributed in Pyrenees ..... *sinuaticollis* FAIRMAIRE, 1861.
- . Lateral sides of pronotum feebly but evenly rounded, before posterior angles not sinuate. Upper side black or with very feeble metallic reflex. Forms two subspecies. Body larger, length of female over 11.0 mm. Antennomeres 8, 9 and 10 oblong (nominotypical subspecies from south-eastern France and northern Italy), body smaller, length of female under 11.0 mm, antennomeres 8, 9 and 10 shortened, not longer than broad (subsp. *cebennica* JEANN. from Cevennes) ..... *interstitialis* FAIRMAIRE, 1861.

### *reticollis*-group

Here one species from Pyrenees only. Length of female 10.0–12.0 mm ..... *reticollis* FAIRMAIRE, 1861.

### *monticola*-group

#### Key to species

1. Elytral epipleura rather matt, covered by fine scratches; if puncturation present, then punctures more or less confluent ..... 2.
- . Elytral epipleura at least along external side smooth, shining, punctate, punctures free. Pronotum moderately strong and dense punctured. Antennomeres 8, 9 and 10 oblong, 2 × longer than thick. Forms two subspecies: on elytra interstices convex, body smaller, length of female under 12.0 mm (nominotypical subspecies distributed in western Aragonia), on elytra interstices flat, body larger, length of female over 13.0 mm (subsp. *spectacula* BECHYNÉ, 1962 from Tarragona). Known from Spain only ..... *aragonica* BALBI, 1892.
2. Upper side pure black. Antennomeres 8, 9 and 10 in both sexes short, barely longer than thick, almost spherical ..... 3.
- . Upper side with metallic bluish or violaceous sheen. Antennomeres 8, 9 and 10 in male oblong, about 1.5 × longer than thick. Pronotum 2 × broader than long. Length of female 10.0–12.0 mm. Distributed in Pyrenees ..... *cyanescens* FAIRMAIRE, 1861.
3. Elytra densely and finely rugose, matt. Marginal ridge on lateral sides of pronotum very feebly limited. Length of female 9.0–11.0 mm. Distributed in western coast of France ..... *maritima* PERRIS, 1855.

- . Elytra deeply and densely punctate, interstices very shallowly and finely wrinkled or reticulate. Marginal ridge on lateral sides of pronotum usually distinct ..... 4.
- 4. Pronotum heartshaped, widest before its midlength. Elytra strongly punctate, widest in 1/3 of its length, humeral calli distinct. Forms 5 subspecies: body smaller, length of female under 9.0 mm (subsp. *pygmaeola* BECHYNÉ 1949 from Sierra de Guarra), pronotum loosely punctate, its sides not sloping, on elytra interstices without minute punctures, length of female 9.5–12.0 mm (nominotypical subspecies from Pyrenees and Catalonia), as *dallei* s. str., but on elytra interstices with minute punctures (subsp. *pseudoperezi* BECHYNÉ, 1953, from western Pyrenees), pronotum before posterior angles indistinctly sinuate, length of female 9.5–10.5 mm (subsp. *franzi* BECHYNÉ, 1962, from Navarra), pronotum before posterior angles distinctly sinuate, length of female 9.0–12.0 mm (subsp. *cylindricollis* BECHYNÉ, 1948, from western Pyrenees) ..... ***dallei*** LABOISSIÈRE, 1939.
- . Pronotum not heartshaped ..... 5.
- 5. Pronotum in its midlength obtuse-angulately widened. Length of female 10.0–12.0 mm. Occurs in middle part of Pyrenees ..... ***temperei*** JEANNE, 1965.
- . Pronotum not angulately widened, widest behind its midlength ..... 6.
- 6. Elytra strongly or very strongly punctured. Upper side black rarely with feeble metallic reflex. Length of female 9.0–11.0 mm. Forms 2 subspecies: elytral punctures strong, here and there confluent (nominotypical subspecies from foothills of French and Spanish Pyrenees), elytral punctures very strong, confluent (subsp. *atlimontana* BECHYNÉ, 1949, from Central Pyrenees) ..... ***monticola*** DUFOR, 1843.
- . Elytra moderately strongly punctured. Body black, femora basally and a few basal antennomeres dark brown. Length of female 9.0–12.0 mm. Distributed in western Pyrenees ..... ***obsoleta*** LABOISSIÈRE, 1937.

#### ***perezi***-group

Here one species only. Legs entirely black, ground of pronotum smooth, puncturation strong and dense, sometimes partly confluent. Length of female 9.0–11.0 mm. Forms 3 subspecies: body on average larger, in both sexes oblong, length of female 10.0–11.0 mm (nominotypical subspecies from central part of Spain), body on average smaller, in male oblong, in female stout, length 9.0–10.5 mm, pronotum on underside densely punctate (subsp. *vivesi* BECHYNÉ, 1962 from N Spain), as *vivesi*, but pronotum on underside sparsely punctate (subsp. *praecox* BECHYNÉ, 1953, from Morocco). Species distributed in mountains of northern and central Spain ..... ***perezi*** FAIRMAIRE, 1884.

#### ***geniculata***-group

##### Key to species

- 1. Femora in the middle juicy red or dark red, remaining part of legs pure black. Length of body about 9.0 mm. Distributed in north-eastern and northern Spain ..... ***geniculata*** GERMAR, 1824.
- . Femora in the middle red or red-brown, remaining part of legs black with metallic, green or violaceous reflex. Length of body 9.0–10.0 mm. Forms two subspecies: on av-



erage larger (about 10.0 mm), femora in the middle red or reddish-brown, underside moderately strongly punctate (nominotypical subspecies from Portugal and north-eastern Spain), on average smaller (about 9.0 mm), femora in the middle very dark red or pitchy, underside strongly punctate (subsp. *convexifrons* FAIRMAIRE, 1880). Distributed in eastern and northern parts of Iberian Peninsula .....  
 ..... *asturiensis* KRAATZ, 1879.

*lusitanica*-group

Key to species

1. Pronotum widest behind its midlength, lateral sides rounded ..... **2.**
- . Pronotum widest near base, lateral sides very feebly rounded or almost straight ...  
 ..... **6.**
2. Elytra very short, almost globulous. Black, feebly shining, legs and antennae with violaceous reflex. Pronotum rugosely, moderately strongly and very densely punctate. Elytra rugose, strongly punctate. Length about 11.0 mm. Distributed in western Spain and southern Portugal ..... *sphaeroptera* FAIRMAIRE, 1873.
- . Elytra not very short, oval ..... **3.**
3. Upper side feebly convex. Length 9.0–11.0 mm. Forms two subspecies: body more oblong, lateral sides of pronotum without marginal ridge (nominotypical subspecies from Portugal and nord-western Spain), body more stout, lateral sides with very fine, but perceptible marginal ridge (subsp. *semilaevis* FAIRMAIRE, from Central Spain). Known from Iberian Peninsula only ..... *chloropus* (GERMAR, 1824).
- . Upper side strongly convex ..... **4.**
4. Upper side pure black ..... **5.**
- . Upper side dark brown with bronzy metallic reflex, legs with feeble bluish sheen. Pronotum moderately fine, densely punctate. Elytra densely punctate, interstices finely punctulate and fairly wrinkled. Length about 9.5 mm. Described from Portugal ..... *janthinipes* FAIRMAIRE, 1880.
5. Femora partly red, remaining parts of legs and basis of antennae black with feeble bluishsheen. Upper side with metallic reflex. Length 9.0–13.0 mm. Distributed in Portugal and in northern Spain ..... *gougeleti* FAIRMAIRE, 1859.
- . Legs entirely black with bluish-violaceous reflex, strongly shining. Head and pronotum with feeble bluish reflex, elytra black. Elytra widest behind its midlength. Underside more densely and strongly punctate than upper side. Length 13.0 mm. Described based on one female only. Reported from Spain .....  
 ..... *oblongula* FAIRMAIRE, 1880.
6. Lateral sides of pronotum slightly rounded, metallic reflex of upper side feeble, violaceous or absent ..... **7.**
- . Lateral sides of pronotum almost straight, metallic reflex of upper side distinct, bronzy. On elytra puncturation double, moderately strong, dense, on pronotum uniform, fine and rather sparse. Length 9.0–12.0 mm. Distributed in Portugal .....  
 ..... *lusitanica* (FABRICIUS, 1781).
7. Humeral calli distinct, body oblong, upper side pure black. Length 8.0–11.0 mm. Distributed in north-western part of Iberian Peninsula .....  
 ..... *trapezicollis* FAIRMAIRE, 1873.

- . Humeral calli largely reduced, body short oval, upper side with violaceous metallic reflex. Length 9.0–12.0 mm. Distributed in northern Spain .....  
 ..... **globipennis** FAIRMAIRE, 1873.

***strangulata***-group

Here one species only. Oval, moderately convex, upper side black, legs black with violaceous reflex. Pronotum widened anteriorly, before posterior angles deeply sinuate, posterior angles sharp, rather finely and loosely punctate. Elytra finely rugose primary punctures moderately strong, interstices very finely punctulate. Length 8.5–13.0 mm. Forms 7 subspecies (or rather local forms): elytral epipleura smooth, pronotum very finely punctulate (subsp. *epipleuralis* BECHYNÉ, 1953), in remaining subspecies epipleura wrinkled: punctures on pronotum here and there confluent (subsp. *breiti* BECHYNÉ, 1953). Puncturation of elytra fine, free, femora shining (nominotypical subspecies), as *strangulata* s. str., but femora matt (subsp. *decens* BECHYNÉ, 1953), pronotum moderately fine or finely punctured, puncturation of elytra strong, often partly confluent, interstices densely punctulate (subsp. *pseudostrangulata* BECHYNÉ, 1953), as *pseudostrangulata*, but interstices scarcely punctulate (subsp. *sculptipennis* BECHYNÉ, 1948), pronotum and elytra similarly, strong punctate (subsp. *aubryi* JEANNE, 1965). Distributed in central part of Pyrenees ...  
 ..... ***strangulata*** FAIRMAIRE, 1861.

***pratensis***-group

Key to species

1. Pronotum strongly convex, its lateral sides sloping. Length of female 13.0–14.0 mm (= *coriaria*, OLIVIER, 1807, nec LAICHARTING 1781). Forms 65 subspecies. European subspecies: anterior part of marginal ridge on lateral sides of pronotum in dorsal view well-visible, elytra feebly rugose (nominotypical subspecies from countries of ex-Yugoslavia), marginal ridge on lateral sides of pronotum in dorsal view in whole length barely visible, abdomen strongly punctate (subsp. *dubitabilis* FAIRMAIRE, 1873, described from southern Serbia), as *dubitabilis*, but abdomen finely punctate (subsp. *parnassia* FAIRMAIRE, 1868 from Greece). Asiatic subspecies: elytra strongly rugosely punctate, suture smooth (subsp. *globulata* FAIRMAIRE, 1873 from Armenia), elytra moderately strongly punctate, suture horizontally scratched (unnamed subspecies = *coriaria* OLIVIER, 1807 from western part of Asia Minor) .....  
 ..... ***olivieri*** (FAIRMAIRE, 1868).
- . Pronotum moderately convex, its lateral sides not sloping, marginal ridge on lateral sides of pronotum in dorsal view well-visible in whole length ..... **2.**
2. Pronotum heartshaped, longer ..... **3.**
- . Pronotum feebly heartshaped, shorter ..... **5.**
3. Pronotum before posterior angles distinctly emarginate, but rather feebly narrowed. Length of female 9.5–11.0 mm. Forms two subspecies: pronotum as in description (nominotypical subspecies), pronotum shorter (subsp. *subrugosa* DEPOLI, 1926). Distributed in countries of ex-Yugoslavia ..... ***durmitoriensis*** APFELBECK, 1912.

- Pronotum before posterior angles less distinctly emarginate, but stronger narrowed. Body oblong ..... **4**.
- 4. Abdomen strongly and densely punctate, mesosternum with two little, elevate humps. Distributed in Bosnia-Herzegovina and Croatia ..... **stepaneki** BECHYNÉ, 1946.
- Abdomen finely punctate, mesosternum flat. Distributed in Bosnia-Herzegovina and Croatia ..... **montana** FAIRMAIRE, 1873.
- 5. Length of female 12.0–14.0 mm. Metallic reflex of upper side often greenish, sometimes violaceous. Elytra rugosely punctate. Distributed in northern Italy and Croatia ..... **pratensis** (DUFTSCHMID, 1825).
- Length of female under 11.0 mm. Elytra feebly rugosely punctate, primary punctures forms indistinct rows. Here *durmitoriensis* subsp. *subrugosa* (see thesis 3).

### **sardea-group**

#### Key to species

1. Lateral sides of pronotum without marginal ridge. Length 12.0 mm. Endemic to Malta ..... **melitensis** WEISE, 1882.
- Lateral sides of pronotum with marginal ridge ..... **2**.
2. Pronotum very short and broad, its breadth about 2.5 × greater than length 10.0–12.0 mm. Described from Corsica ..... **zavadili** BECHYNÉ, 1944.
- Pronotum longer, its breadth under 2 × greater than length ..... **3**.
3. Punctures on pronotum partly confluent. Upper side bluish. Clypeus impressed, his anterior ridge distinctly limited. Length 10.0–12.0 mm. Known from Sardinia only ...  
..... **susteraï** BECHYNÉ, 1944.
- Punctures of pronotum not confluent ..... **4**.
4. Along lateral margin of pronotum runs a irregular row of very strong punctures. Upper side black. Length of female 12.0–13.0 mm. Endemic to Sicily .....  
..... **sicelidis** REICHE, 1860.
- Lateral margins of pronotum without a row of very strong punctures. Length of female 12.0–14.0 mm. Forms two subspecies: elytra oblong oval (nominotypical subspecies from Sardinia), elytra broadly rounded (subsp. *corsica* BECHYNÉ, 1944, from Corsica) ..... **sardea** VILLA, 1835.

### **gravis-group**

One species only. Externally similar to *tenebricosa* (see *tenebricosa*-group, p. 627). Sexual dimorphism in build of fore tarsi very strong. Length 10.0–13.0 mm. Distributed in Andalusia ..... **gravis** ROSENHAUER, 1856.

Subgenus *Timarcha* s. str.

Key to auxiliary groups

1. Mesosternum with two dentiform or spiniform humps ..... **2**.
- Mesosternum transversely cut or emarginate, at most with small humps ..... **10**.
2. Elytra grown together ..... **3**.
- Elytra free ..... **8**.
3. Elytra on whole surface wrinkled or vermiculately folded ..... **4**.
- Elytra punctate, sometimes feebly wrinkled on apical part only ..... **6**.
4. Legs partly red ..... **calceata**-group (p. 619).
- Legs black ..... **5**.
5. Pronotum uniformly punctate ..... **hispanica**-group (p. 619).
- Pronotum laterally stronger punctate and wrinkled ..... **tingitana**-group (p. 619).
6. Elytra uniformly strongly or moderately strongly punctate .....  
..... **fallax**-group (p. 620).
- Elytra finely punctate or smooth ..... **7**.
7. Elytra finely punctate. Marginal ridge of pronotum fine, but present on whole length  
of lateral side ..... **intermedia**-group (p. 620).
- Elytra without punctures, smooth. Pronotum strongly constricted at base, marginal  
ridge does not reach to posterior angle ..... **balearica**-group (p. 620).
8. In female hind tarsi with entire naked median longitudinal groove .....  
..... **insparsa**-group (p. 621).
- In female hind tarsi entirely covered by short setae or with shortened naked groove  
..... **9**.
9. Pronotum strongly constricted at base. In both sexes last article of maxillar palpi  
very broad ..... **coarcticollis**-group (p. 621).
- Pronotum feebly constricted at base. In both sexes last article of maxillar palpi  
oval ..... **parvicollis**-group (p. 621).
10. In fore legs of female first tarsomeron with entire naked median groove ..... **11**.
- In fore legs of female first tarsomeron with shortened median groove or entirely  
covered by short setae ..... **13**.
11. Pronotum convex, more or less heartshaped, lateral borders strongly sloping. African  
species only ..... **12**.
- Pronotum rather flat, lateral borders feebly sloping ..... **15**.
12. Body large (16.0–22.0 mm), in male 3. tarsomeron of hind legs with a smooth  
median line. Fore tarsi in male strongly widened ..... **latipes**-group (p. 628).
- Body smaller (10.0–15.0 mm), in male 3. tarsomeron of hind legs entirely covered  
by short setae. Fore tarsi in male moderately widened ..... **insignis**-group (p. 623).
13. In male mid tibiae at least 1.5 × longer than corresponding tarsi ..... **14**.
- In male mid tibiae short, slightly longer than corresponding tarsi. Species from  
Eastern Europe ..... **rugulosa**-group (p. 622).
14. Pronotum rather flat, laterally rounded and feebly sloping, often heartshaped. Elytra  
finely and densely punctate. European species only .....  
..... **tenebricosa**-group (p. 627).
- Pronotum convex, laterally feebly rounded and distinctly sloping. Body length un-  
der 15.0 mm. Species from North Africa ..... **scabripennis**-group (p. 622).

15. Elytra densely and coarsely punctate, strongly wrinkled or wavy ..... *rugosa*-group (p. 624).  
 –. Elytra not particularly densely and coarsely punctate, sometimes (in female) feebly wavy ..... **16**.
16. Pronotum laterally with several large, foveiform punctures ..... *fossulata*-group (p. 628).  
 –. Pronotum normally punctate, without foveiform punctures ..... *laevigata*-group (p. 626).

*hispanica*-group

Key to species

1. Pronotum strongly and densely punctured, usually widest in the midlength. Body black, legs with feeble violaceous reflex. Length 9.0–14.0 mm. Variation: legs blue (ab. *sobrina* FAIRMAIRE, 1884). Forms a few subspecies: pronotum distinctly widened anteriorly, widest in anterior part (subsp. *rugipennis* PEREZ, 1865), body oval, elytra rugose, their interstices elevate (subsp. *laevisterna* FAIRMAIRE, 1880, described from Cuenca), body roundish, on elytra furrows separating rugosities very deep (nominotypical subspecies distributed in central Spain and in Andalusia), body roundish, smaller (about 9.0 mm), on elytra furrows separating rugosities moderately deep (subsp. *transversicollis* FAIRMAIRE, 1880, described from Cordoba). Distributed in Spain ..... *hispanica* HERRICH-SCHÄFFER, 1838.
- . Pronotum moderately strongly and densely punctured ..... **2**.
2. Pronotum narrow, considerably narrower than elytra, body large, its length in female about 15.0 mm. Distributed in Andalusia ..... *apricaria* (WALTL, 1835).
- . Pronotum short and broad, body small, its length in female about 10.0 mm. Forms two subspecies: upper side strongly shining, legs blue (nominotypical subspecies described from Portalegre), upper side feebly shining, legs with violaceous reflex (subsp. *vermiculata* FAIRMAIRE, 1880, described from Sierra de Monchique). Distributed in southern and central part of Portugal ..... *erosa* FAIRMAIRE, 1873.

*tingitana*-group

Here one species only. Body almost globulous, antennae relatively thick. Pronotum densely and rather finely punctate, upper side black. Length about 10.0 mm. Described from Tanger ..... *tingitana* FAIRMAIRE, 1873.

*calceata*-group

One species only. Pronotum heartshaped, upper side black with bluish reflex. Legs red, knees and tarsi bluish-black. Pronotum strongly punctate, puncturation double. Elytra densely, coarsely punctured. Length 10.0–12.0 mm. Distributed in central and southern part of Iberian Peninsula ..... *calceata* PEREZ, 1865.

## *fallax*-group

### Key to species

1. Pronotum strongly punctate, punctures double. Upper side with bronzy metallic reflex. Length 9.0–14.0 mm. Includes four subspecies (or rather local forms): body large, length of female 14.0–15.0 mm, pronotum not stronger shining than elytra, secondary puncturation on elytral interstices loosely scattered (subsp. *tortosensis* BECHYNÉ, 1948, described from Catalonia), as *tortosensis*, but body smaller (in female 10.5–12.0 mm), secondary puncturation on elytral interstices dense (subsp. *piochar-di* FAIRMAIRE, 1873), pronotum stronger shining than elytra, secondary puncturation on elytral interstices very fine, indistinct, length of female 11.5–13.0 mm (nominotypical subspecies from western Spain), as *fallax* s. str., but secondary puncturation of elytral interstices distinct, length of female 12.5–14.0 mm (subsp. *sagrensis* KUNTZEN, 1911 from south-western Spain). Distributed in Iberian Peninsula ..... *fallax* PEREZ, 1865.
- . Pronotum finely and moderately densely punctate ..... 2.
2. Pronotum very finely, uniformly punctate, metallic sheen of upper side rather strong. Length of female 12.0–13.0 mm. Distributed in Aragonia ..... *aurichalcea* BECHYNÉ, 1948.
- . Pronotum not particularly finely punctate, metallic sheen of upper side rather feeble ..... 3.
3. In male last abdominal sternite in the middle densely punctate and covered by black hairs ..... *strophium* WEISE, 1888.
- . In male last abdominal sternite in the middle loosely punctate, hairless ..... 4.
4. Head strongly, in anterior part densely punctured. Body small, length 8.0–10.5 mm. Forms two subspecies: body smaller, length of male 8.0–8.5 mm (nominotypical subspecies, described from Granada), body larger, length of male 9.0–10.5 mm (subsp. *discolata* BECHYNÉ, 1948 from central Spain). Distributed in southern and central Spain ..... *granadensis* BECHYNÉ, 1948.

## *intermedia*-group

### Key to species

1. Posterior angles of pronotum strongly sloping. Upper side black, with very feeble bluish reflex, matt. Pronotum moderately strongly, elytra loosely and finely punctate. Length 12.0–15.0 mm. Distributed in southern Spain ..... *kiesenwetteri* KRAATZ, 1879.
- . Posterior angles of pronotum horizontal or feebly sloping. Pronotum uniformly punctate. Variation: on pronotum several coarse punctures (ab. *ehlersi* WEISE, 1882). Distributed in Spain ..... *intermedia* HERRICH-SCHÄFFER, 1838.

## *balearica*-group

Here one species only. General view as in plate LXXIV, **phot. 660**. Relatively large (11.0–15.0 mm), upper side silky matt, usually bluish, sometimes greenish, with distinct metallic reflex, rarely black. Endemic to Balearic Islands ..... *balearica* GORY, 1844.

### *insparsa*-group

#### Key to species

1. On lateral sides of pronotum marginal ridge partly or entirely absent ..... **2.**
- . On lateral sides of pronotum marginal ridge entire ..... **3.**
2. Pronotum almost impunctate, just at basis strongly narrowed. Elytra very finely, loosely punctate. Length 7.5–10.0 mm. Occurs in Sierra Nevada .....  
..... *seidlitzii* KRAATZ, 1879.
- . Pronotum distinctly punctate. Marginal ridge on lateral sides of pronotum absent only before posterior angles. Length 9.0–11.0 mm. Described from Alpujarras ..... *heydeni* WEISE, 1882.
3. On elytra interstices flat. Upper side moderately shining. Body large, length 12.0–16.0 mm. Distributed in southern Spain ... *marginicollis* ROSENHAUER, 1856.
- . On elytra interstices convex. General view as in plate LXXIV, **phot. 661**. Upper side feebly shining. Body smaller, length 11.0–12.5 mm. Distributed in central and southern parts of Spain ..... *insparsa* ROSENHAUER, 1856.

### *parvicollis*-group

One species only. Pronotum strongly narrowed behind. Elytra rather densely and finely punctate, interstices flat. General view as in plate LXXIV, **phot. 662**. Body black, legs and basis of antennae with bluish sheen. Length 9.0–14.0 mm. Occurs as three local forms, ranked as subspecies: elytra not strongly, rather grassy shining (nominotypical subspecies from Sierra Nevada, Granada and Andalusia), upper side shining, length of body under 12.0 mm (subsp. *nitendula* BECHYNÉ, 1953 from western Andalusia), upper side shining, length of body over 12.0 mm (subsp. *elocata* BECHYNÉ, 1953 from Andalusia) ..... *parvicollis* ROSENHAUER, 1856.

### *coarcticollis*-group

#### Key to species

1. Pronotum very finely, but perceptibly punctate. Length 9.0–12.0 mm. Forms two subspecies: on average larger, length of body 10.0–12.0 mm. Upper side black with bluish sheen, on elytra interstices flat (subsp. *paulinoi* KRAATZ, 1879, from Portugal), on average smaller, length of body 9.0–11.0 mm. Upper side feebly shining, black with violaceous reflex on elytra interstices convex (nominotypical subspecies from southern Spain). Distributed in south-western part of Iberian Peninsula ..... *coarcticollis* FAIRMAIRE, 1873.
- . Pronotum almost smooth, puncturation barely perceptible. Length 9.0–10.0 mm. Distributed in northern Morocco ..... *riffensis* FAIRMAIRE, 1887.

## *rugulosa*-group

### Key to species

1. Pronotum very finely and sparsely punctate. Anterior margin of clypeus elevate. Length about 9.0 mm. Described based on one specimen only, perhaps a variation or local form of *rugulosa* (antithesis 1) ..... ***melica*** BECHYNÉ, 1947.
- . Punctures of pronotum of very different sizes, irregularly scattered. Anterior margin of clypeus not elevate. A few subspecies (local forms?) are described: body large, its length 11.0–11.5 mm, upper side matt, pronotum rather loosely punctate (subsp. *globata* FAIRMAIRE, 1873), upper side rugosely punctate, punctures partly confluent, interstices uneven, pronotum before posterior angles strongly sinuate, length 6.5–9.5 mm (subsp. *lomnickii* MILLER, 1867 from south-eastern Poland), as *lomnickii*, but head not rugosely punctate and pronotum moderately sinuate (nominotypical subspecies, from Moldavia and south-eastern Carpathians), punctures of pronotum not confluent, on elytra interstices flat, length of female 8.5–10.5 mm (subsp. *stichai* BECHYNÉ, from Slovakia and Ukrainian Carpathians), as *stichai*, but smaller (length of female 8.0–8.5 mm), elytra less densely punctate (subsp. *sinaiana* BECHYNÉ, 1947 from southern Romania) ..... ***rugulosa*** HERRICH-SCHÄFFER, 1838.

## *scabripennis*-group

### Key to species

1. Apical article of maxillar palpi in both sexes relatively narrow, oval. Length of female 12.0–13.0 mm. Distributed in Morocco ..... ***freyi*** BECHYNÉ, 1953.
- . Apical article of maxillar palpi in both sexes, particularly in male, strongly widened ..... **2.**
2. Femora and tibiae in most part reddish ..... **3.**
- . Legs entirely black or black with metallic reflex ..... **5.**
3. Elytra finely, loosely punctate. Upper side black, very feebly shining. Body oval. Length 11.0–13.0 mm. Forms two subspecies: legs coloured as above (nominotypical subspecies from Algeria), legs entirely black (subsp. *demoflysi* NORMAND, 1950, described from Tunisia) ..... ***punica*** LUCAS, 1849.
- . Elytra strongly and deeply punctured. Body almost globulous. Metallic reflex of upper side greenish ..... **4.**
4. Upper side feebly shining. Length of body about 8.0 mm. Described from Algerian coast near Bejaïa ..... ***brevipennis*** PIC, 1919.
- . Pronotum matt, remaining upper side shining. Length of body 9.0–11.0 mm. Distributed in Algeria ..... ***endora*** BUQUET, 1840.
5. Elytra finely punctate. Forms two subspecies: length of female 13.0–15.0 mm, pronotum before posterior angles distinctly emarginated. Puncturation of upper side fine but distinct (nominotypical subspecies from northern Morocco), length of female 11.5–13.0 mm, pronotum before posterior angles barely emarginated. Puncturation of upper side almost imperceptible (subsp. *liebmanni* BECHYNÉ, 1953, from High and Middle Atlas) ..... ***maroccana*** WEISE, 1882.
- . Elytra strongly punctate ..... **6.**



6. Elytra not wringled. Here *punica* subsp. *demoflysi* (thesis 3).
- Elytra wringled, vermiculately folded and punctured ..... 7.
7. Pronotum widened anteriorly, strongly heartshaped. Body black, legs with violaceous sheen. Length 11.0–13.0 mm. Distributed in northern Morocco ..... ***prujai*** KOCHER, 1963.
- Pronotum not distinctly heartshaped. Forms 7 subspecies. Pronotum laterally with hollow-like punctures (nominotypical subspecies from northern Morocco), remaining subspecies without hollow-like punctures laterally: elytra matt, feebly folded, length 10.0–12.0 mm (subsp. *bechynei* KOCHER, 1958 from northern Morocco), as *bechynei*, but larger, length 13.0–15.0 mm (subsp. *vasquezi* JOLIVET, 1968, from Morocco), elytra distinctly folded, very strongly punctured, shining, length about 15.0 mm (subsp. *ifranensis* JOLIVET, 1968, from Middle Atlas), elytra moderately strongly punctured, upper side violaceous, legs strongly shining, length of female 12.0–14.0 mm (subsp. *infoveolata* KOCHER, 1951 from northern Morocco), upper side black, legs bluish, length of female 11.0–13.0 mm (subsp. *peresa* PEYERIMHOFF, 1908) ..... ***scabripennis*** FAIRMAIRE, 1868.

### *insignis*-group

#### Key to species

1. Legs partly reddish ..... 2.
- Legs entirely black or with metallic reflex ..... 4.
2. Pronotum densely punctate. Lateral borders of pronotum broadly red. Punctures of elytra moderately strong, rugosely confluent, interstices very convex. Length of female 11.0–13.5 mm. Distributed in Algeria ..... ***corallipes***, FAIRMAIRE, 1873.
- Pronotum very densely punctate. Pronotum entirely black or with anterior angles dark red ..... 3.
3. Pronotum at least with traces of dark reddish spots in anterior angles, primary punctures of pronotum fine, secondary barely perceptible. Elytra strongly, loosely punctured. Length of female 11.0–15.0 mm. Includes two forms, ranked as subspecies: legs partly red (nominotypical subspecies), legs entirely black (subsp. *inornata* BECHYNÉ, 1944). Distributed in Algeria ..... ***insignis*** GUÉRIN, 1859.
- Pronotum uniformly black, elytra rather densely punctured. Length of female 12.0–15.0 mm. A species from High Atlas, forming several local variations ranked as subspecies. Mesosternum transversely truncate, on elytra interstices convex (subsp. *iblanensis* ANTOINE, 1939, from eastern part of High Atlas). In remaining subspecies apical part of mesostentum emarginate: elytra extremely finely and sparsely punctured, interstices flat, upper side distinctly shining, length of female 13.0–15.0 mm (nominotypical subspecies from central and western part of High Atlas), as *mairei* s. str., but smaller (length of female 12.0–13.0 mm), elytra matt, their puncturation fine but distinct (*lecerfi* KOCHER, 1951, from central part of eastern Atlas), elytra moderately strongly punctured, interstices fairly convex (subsp. *peyerimhoffi* KOCHER, 1951, from central part of High Atlas), as *peyerimhoffi*, but interstices flat, body more oblong (subsp. *humberti* PEYERIMHOFF, 1925, perhaps identical with *tichuktensis* KOCHER, 1956, from central and western part of High Atlas; forms an unnamed aberration with reddish lateral borders of pronotum ..... ***mairei*** PEYERIMHOFF, 1923.

4. On legs metallic reflex feeble or absent ..... 5.  
 - On legs metallic sheen distinct ..... 8.
5. Breadth of pronotum about 1.5 × greater than its length ..... 6.  
 - Breadth of pronotum about 2 × greater than its length. Length of body 12.5–14.0 mm ..... 7.
6. Head and pronotum finely and loosely punctate. Length of female 11.0–14.0 mm. Described from Algeria ..... **melas** BECHYNÉ, 1944.  
 - Head loosely, but strongly, pronotum doubly punctate. Length of female about 10.0 mm. Distributed in Algeria ..... **henoni** FAIRMAIRE, 1873.
7. Legs black, without metallic reflex. Breadth of pronotum at most 2 × greater than its length. Here *insignis* subsp. *inornata* (see thesis 3).  
 - Legs with blue metallic reflex. Breadth of pronotum at least 2 × greater than its length. Described from High Atlas ..... **theryi** KOCHER, 1958.
8. Breadth of pronotum under 1.7 × greater than its length ..... 9.  
 - Breadth of pronotum over 1.7 × greater than its length ..... 10.
9. Puncturation of pronotum fine and dense. Elytra moderately finely punctate, interstices slightly undulate. Length 10.0–14.0 mm. Described from Algeria ..... **opacicollis** BECHYNÉ, 1944.  
 - Puncturation of pronotum strong and dense. Elytra strongly punctate, interstices barely undulate. Length 9.0–14.0 mm. Described from Algeria ..... **corpulenta** BECHYNÉ, 1944.
10. Breadth of pronotum under 2 × greater than its length ..... 11.  
 - Breadth of pronotum over 2 × greater than its length. Pronotum before posterior angles not sinuately emarginate, very flat, its puncturation double. Length of female 14.0–15.0 mm. Distributed in Algeria ..... **crassaticollis** FAIRMAIRE, 1873.
11. Body oblong, elytra coarsely punctured, pronotum heartshaped. Length 11.0–14.5 mm. Distributed in Libya ..... **cyrenaica** PEYERIMHOFF, 1925.  
 - Body short oval, elytra strongly punctured, pronotum with evenly rounded sides, not heartshaped. Length 10.0–14.0 mm. Described from Algeria ..... **nitidipes** BECHYNÉ, 1944.

#### **rugosa**-group

##### Key to species

1. Tibiae and femora or femora only red. Pronotum in central part extremely finely and shallowly punctulate. Puncturation of elytra very strong and deep, only in apical part confluent. Length of female 15.0–17.0 mm. Distributed in southern Spain ..... **espanoli** BECHYNÉ, 1948.  
 - Legs black or black with metallic reflex ..... 2.
2. Puncturation of pronotum distinct ..... 4.  
 - Pronotum in central part smooth, puncturation absent or almost absent. Rather large species, length of female to 21.0 (rarely to 25.0) mm ..... 3.
3. Fore femora strongly rugosely punctate. Elytral epipleura smooth. Body oblong. In female length of body often exceeds 18.0 mm. Forms 6 local forms, ranked as subspecies: body smaller (to 17.0 mm), elytra strongly vermiculately folded, shining

- (subsp. *rungsi* KOCHER, 1958, described from central part of Middle Atlas), as *rungsi*, but elytra less shining, sexual dimorphism stronger pronounced (subsp. *mesatlantica* KOCHER, 1958, also from central part of Middle Atlas, probably identical with *rungsi*), elytra almost globulous, length 17.0–20.0 mm (subsp. *khalouensis* JOLIVET, 1966, from northern Morocco), upper side matt, length 15.0–18.0 mm (subsp. *subscabra* KOCHER, 1958, from Middle Atlas), elytra rather feebly vermiculately folded, female much longer (18.0–25.0 mm) than male (15.0–16.0 mm) (subsp. *tangeriana* BECHYNÉ, 1944, from northern Morocco), as *tangeriana*, but puncturation on pronotum perceptible and sexual dimorphism not so very large (nominotypical subspecies from Moroccan coast of Atlantic) ..... ***scabra*** (OLIVIER, 1807).
- . Fore femora simply punctate. Elytral epipleura matt, rugosely punctate. Length 12.0–19.0 mm. Similarly to *scabra* occurs as various local forms, ranked as subspecies: puncturation of pronotum barely perceptible, elytral puncturation rugosely confluent, pronotum almost smooth (nominotypical subspecies from atlantic coast of Morocco), as *atlantica* s. str., but elytral punctures free, puncturation of pronotum extremely fine but perceptible (subsp. *mima* BECHYNÉ, 1947), puncturation of pronotum very fine but distinct, elytra almost globulous, upper side with bronzy sheen (subsp. *araneiformis* BECHYNÉ, 1947, from Algerian coast), as *araneiformis*, but from Moroccan atlantic coast (*aurulenta* KOCHER, 1956), elytra oblong, length of female over 16.0 mm, upper side black, fairly shining (subsp. *rugata* KOCHER, 1951, described from Melilla), elytra oblong, length of female under 16.0 mm, upper side black, matt (subsp. *aterrima* BECHYNÉ, 1944). Distributed in Morocco and Algeria ..... ***atlantica*** BECHYNÉ, 1944.
4. Antennae short, antennomere 4. very short, sometimes almost globulous. Upper side usually with bronzy or cupreous metallic reflex. Underside of abdomen rugose, elytra strongly rugose. Length of female 15.0–19.0 mm. Variation: abdomen very feebly rugose, finely punctate (ab. *laeviventris* BECHYNÉ, 1944). Distributed in Algeria and Tunisia ..... ***generosa*** ERICHSON, 1841.
- . Antennae longer, 4. antennomere at least 1,5 longer than broad ..... 5.
5. Body stout, elytra roundish, interstices strongly convex. General view as in plate LXXIV, **phot. 664**. Pronotum sparsely and very finely punctate. Includes 3 subspecies: body longer (in female to 17.0 mm) and more oblong (nominotypical subspecies from northern parts of Morocco, Algeria and Tunisia), body smaller (in female to 15.0 mm), roundish (subsp. *kourili* BECHYNÉ, 1944, from Algeria), body small (in female to 13.0 mm), slightly oblong (subsp. *minutissima* BECHYNÉ, 1944, from Algerian coast of Mediterranean Sea). Distributed as above .... ***rugosa*** (LINNAEUS, 1767).
- . Body oblong, length of female at most 15.0 mm ..... 6.
6. Pronotum matt, densely punctate ..... 7.
- . Pronotum shining, loosely and finely punctate ..... 8.
7. Antennomere 3. at least 1.5 × longer than the 4. Elytra in both sexes shining. Length of female 13.0–14.0 mm. Described from Djelfa in Algeria .... ***spuria*** BECHYNÉ, 1947.
- . Antennomeres 3. and 4. approximately equally long. Elytral punctures partly confluent, interstices with numerous wrinkles. Elytra in female matt. Occurs as two subspecies: underside finely punctate and very feebly wrinkled, metallic reflex of upper side bronzy, length of female 11.0–13.0 mm (nominotypical subspecies from mountains of western Algeria), underside moderately strongly punctate and uniformly wrinkled, metallic reflex of upper side purplish, length of female to 15.0 mm (subsp. *algorica*

- BECHYNÉ, 1947, described from Djelfa in Algeria). Distributed in Algeria .....  
 ..... **angusta** BECHYNÉ, 1944.
8. Fore tarsi of male (without claw article) almost 2 × longer than broad. Puncturation of anterior part of elytra free or very feebly confluent. Length of female to 14.0 mm. Described from western Algeria ..... **gnaptoroides** BECHYNÉ, 1944.
- Fore tarsi of male (without claw article) at most 1.5 × longer than broad. Puncturation of anterior part of elytra confluent. Length of female to 14.0 mm. Described from central part of northern Algeria (Djelfa). Perhaps conspecific with *gnaptoroides* (thesis 8) ..... **djelfaica** BECHYNÉ, 1947.

### *laevigata*-group

#### Key to species

1. Body uniformly pure black. Lateral sides of pronotum before posterior angles distinctly emarginate, pronotum heartshaped, very broad. Puncturation of elytra fine and rather sparse. Includes 5 subspecies: elytra at least 1.4 × longer than broad, pronotum very feebly wrinkled, length of female 12.0–14.0 mm (subsp. *figurata* BECHYNÉ, 1944, from Tunisia), as *figurata*, but pronotum rather densely wrinkled, length of female 14.0–15.0 mm (subsp. *limitata* BECHYNÉ, 1944, from Tunisia), elytra at most 1.2 × longer than broad, elytral suture distinctly transversely wrinkled, elytra moderately strongly punctate, length of female 11.0–12.0 mm (subsp. *pumilio* BECHYNÉ, 1944, from western Tunisia), as *pumilio*, but elytra finely punctate, length of female 13.0–15.0 mm (nominotypical subspecies from western Algeria), as *pumilio*, but elytral suture barely wrinkled, length of female to 14.0 mm (subsp. *distans* BECHYNÉ, 1944, from Tunisia). Distributed in western Algeria and Tunisia .....  
 ..... **brachydera** FAIRMAIRE, 1873.
- Body entirely or partly (at least the legs) with distinct metallic reflex ..... **2.**
2. Pronotum densely and strongly punctate ..... **3.**
- Pronotum very finely punctate ..... **10.**
3. Pronotum very narrow, approximately as long as broad, elytral epipleura conspicuously broad. Described based on one male from Sicily, length of body not given, female unknown ..... **aguilari** BECHYNÉ, 1946.
- Pronotum at least 1.5 × broader than long, elytral epipleura not particularly broad ...  
 ..... **4.**
4. Length of antennomeres 2–4 approximately equal. Length of female 15.0–17.0 mm. Described from Tunisia ..... **taborskyi** BECHYNÉ, 1944.
- Antennomere 3 at least 1.5 × longer than antennomeres 2 or 4 ..... **5.**
5. Body oblong ..... **7.**
- Body short and roundish ..... **6.**
6. On elytra interstices flat, very smooth and even, sparsely and extremely finely punctulate. Length of female 13.0–15.0 mm. Distributed in Tunisia .....  
 ..... **tunisea** PIC, 1919.
- On elytra interstices convex, wavy or finely rugose ..... **7.**
7. Elytra densely and strongly punctate. Length of female 13.0–15.0 mm. Distributed in Tunisia and eastern Algeria ..... **tarsata** BECHYNÉ, 1944.
- Elytra loosely punctate ..... **8.**

8. Elytra finely punctate. Length of female about 13.0 mm. Described from Algeria ....  
 ..... *pfefferi* BECHYNÉ, 1945.
- . Elytra strongly punctate ..... **9.**
9. Lateral sides of pronotum before hind angles strongly emarginate. Pronotum relatively narrow, on average 1.8 × broader than long, strongly punctured. Length of female 15.0–17.0 mm. Distributed in Algeria ..... *turbida* ERICHSON, 1841.
- . Lateral sides of pronotum before hind angles moderately emarginate. Pronotum broader, on average 2.0 × broader than long, moderately strongly punctured. Length of female 15.0–17.0 mm. Forms two variations, unjustly ranked as subspecies: length of female under 19.0 mm, upper side in male stronger shining than in female (nominotypical subspecies), length of female over 19.0 mm, upper side in both sexes similarly shining, in female stronger rugose (subsp. *robustior* BECHYNÉ, 1944). Distributed in Algeria and Tunisia ..... *laevigata* (LINNAEUS, 1767).
10. Pronotum on whole surface strongly shining. Length 15.0–17.0 mm. Described from Tunisia ..... *staneki* BECHYNÉ, 1944.
- . Pronotum entirely matt or partly shining ..... **11.**
11. Pronotum very finely, elytra distinctly stronger punctate. Length of female 15.0–17.0 mm. Includes 4 local forms ranked as subspecies: body stout, elytra in both sexes matt (subsp. *calabrica* BECHYNÉ, 1944, from Calabria), as *calabrica*, but elytra in male moderately shining, legs distinctly blue (subsp. *ruffoi* BECHYNÉ, 1953, from southern Italy), body more elongate, elytra in both sexes matt (nominotypical subspecies from Sicily), as *insularis* s. str., but elytra in male more shining, legs black (subsp. *martialis* BECHYNÉ, 1953, from southern Italy) .... *insularis* BECHYNÉ, 1944.
- . Pronotum and elytra similarly, very finely, uniformly punctate ..... **12.**
12. Legs distinctly metallic blue or greenish-blue, upper side black with violaceous reflex on head and pronotum. Smaller, length of female 14.0–16.0 mm .....  
 ..... *amethystipes* CHEVROLAT, 1873.
- . Legs black or black with violaceous reflex, upper side unicolorous. Larger, length of female 16.0–19.0 mm. Described from Sicily ... *pimelioides* HERRICH-SCHÄFFER, 1838.

### *tenebricosa*-group

#### Key to species

1. Abdominal sternites sparsely and finely punctate, interstices covered by barely perceptible, very fine wrinkles. Forms two variations, usually ranked as subspecies: body length under 14.0 mm, pronotum finely punctate (nominotypical subspecies), body length over 14.0 mm, pronotum moderately strongly punctate (subsp. *camoensii* FAIRMAIRE, 1873). Occurs in Portugal ..... *validicornis* FAIRMAIRE, 1873.
- . Abdominal sternites finely but distinctly punctate, first and anal sternites distinctly wrinkled ..... **2.**
2. Pronotum widest before its midlength, usually heartshaped ..... **3.**
- . Pronotum laterally rounded, widest middle of its length ..... **4.**
3. Species widely distributed in Europe. General view as in plate LXXIV, **phot. 665.** Very variable; numerous subspecies and variations were described (see comments to *T. goettingensis*, *goettingensis*-group, thesis 1). The most important forms ran-

- ked as subspecies: elytra almost globulous, strongly convex, upper side black, length of female 16.0–17.0 mm (subsp. *anglica* BECHYNÉ, 1945, from Great Britain), pronotum strongly heartshaped, in male fore tarsi not particularly broad, 1.3–1.6 × broader than apex of corresponding tibia; upper side usually black, sometimes with blue or violaceous metallic reflex, length of female 15.0–18.0 mm (nominotypical subspecies, from Balkans), pronotum feebly heartshaped, as strong as head punctured, length of female 15.0–16.0 mm (subsp. *iberica* MOTSCHULSKY, 1849, from Georgia), length of female under 15.0 mm, body slightly elongate, pronotum feebly convex, head strongly punctured (subsp. *angusticollis* FAIRMAIRE, 1873, from Pyrenees, southern France and northern Italy), antennomeres 2–6 elongate, antennomere 3 strongly widened, upper side black or black with feeble bronzy metallic reflex, punctures of elytra very fine, length of female 16.0–18.0 mm (subsp. *heyrovskyi* BECHYNÉ, 1945, from Austria). Widely distributed from northern Spain and The British Isles to southern Russia and Caucasian countries ..... ***tenebricosa*** (FABRICIUS, 1775).
- . Species(?) from Apuane Alps, similar to *nicaeensis* (thesis 4), but somewhat smaller and pronotum widest before its midlength. Length of male about 11.0 mm, of female about 13.0 mm ..... ***apuana*** DACCORDI et RUFFO, 1990.
  - 4. Tarsomere 3 of hind tarsi shallowly excised, length of body about 14.0 mm. Distributed in southern Spain and in Balears ..... ***chalcosoma*** FAIRMAIRE, 1868.
  - . Tarsomere 3 of hind tarsi deeply excised, length of female 12.0–15.0 mm. Perhaps a Italian race of *T. tenebricosa* (thesis 3). Includes three forms ranked as subspecies: upper side matt, finely and densely punctate; body entirely black or underside and legs with bluish metallic reflex (nominotypical subspecies from northern Italy and south-eastern France), upper side matt, moderately strongly punctured (subsp. *fremyi* JOLIVET, 1944, from southern France), upper side shining, body relatively short oval (subsp. *italica* HERRICH-SCHÄFFER, 1838 from northern and central Italy). Distributed in France and Italy ..... ***nicaeensis*** VILLA, 1835.

### ***fossulata***-group

One species only. Pronotum evenly convex, very feebly cordiform, shining, with several great, fossuliform punctures. Puncturation of elytra fine, interstices uneven. Length about 13.0 mm. Described from Algeria ..... ***fossulata*** BECHYNÉ, 1948.

### ***latipes***-group

#### Key to species

1. Tarsomere 2 of hind tarsi in male entirely covered by short setae. Upper side black, in male shining, in female matt. Pronotum finely and loosely, elytra moderately strongly punctate. General view as in plate LXXIV, **phot. 666**. Length of female 16.0–20.0 mm. Includes three subspecies: elytra finely, uniformly punctate, punctures not confluent (nominotypical subspecies from Algeria), elytral puncturation here and there confluent, moderately fine, interstices slightly but distinctly folded (subsp. *inaequalis* PIC, 1924, from Tunisia and Libya), as *inaequalis*, but elytra more

- strongly punctate, interstices not folded (subsp. *djerbensis* Pic, 1919, from Tunisia)  
 ..... **latipes** (LINNAEUS, 1767).
- Tarsomere 2 of hind tarsi in male with bare median stripe ..... **2**.
  - 2. Two apical antennomeres not distinctly separate. Elytra very finely punctate, length of female to 21.0 mm. Described from Morocco ..... **apicicornis** BECHYNÉ, 1948.
  - Two apical antennomeres distinctly separate. Length of female 18.0–20.0 mm. Includes 6 forms ranked as subspecies: body stout, elytra short but not globulous, smooth (nominotypical subspecies from north-eastern Morocco), as *punctella* s. str., but elytra particularly short, globulous (subsp. *schrammi* KOCHER, 1956, from north-western Morocco), elytra more elongate, shining, rugosely wrinkled and deeply reticulate (subsp. *teluetica* ESCALERA, 1914, from High Atlas), as *teluetica*, but elytra feebly reticulate, body rather stout, upper side black, feebly shining (subsp. *antiatlantica* JOLIVET, 1968, from central Anti-Atlas), as *teluetica*, but body more elongate, elytra black with greenish metallic reflex (subsp. *sarhroensis* JOLIVET, 1968, from eastern Anti-Atlas). Distributed in Morocco ..... **punctella** MARSEUL, 1870.