Subgenus *Timarchida* Ganglbauer, 1897

Diagnosis

Dorsum light brown with bronze reflection or dark bronze with head brown with bronze reflection. Antennae rufous with antennomeres 7–11 slightly darkened. Palpi brown. Legs rufous or brown with weak metallic reflection. Underside brown with bronze reflection.

Last maxillary palpomere oval, beveled; in male (Fig. 3) last palpomere 1.2 X longer than broad, as long as 1.2 X penultimate palpomere, as wide as latter; in female (Fig. 5) last palpomere 1.4 X longer than broad, as long as 1.2 X penultimate palpomere, as wide as latter; in male last palpomere slightly broader than in female.

Antenna inserted 1.6–2.0 X closer to clypeus than to eye, with antennomeres 10–11 project beyond pronotal base. Antenna narrow, with antennomeres 7–11 weakly broadened.

Orbital lines short, developed only above eye.

Pronotum 1.8 X broader than long, convex, broadest basally or at mid-length, with lateral sides arc-shaped, with slightly projecting posterior angles. Anterior setiferous pore absent. Pronotum laterally swollen along entire length. Pronotal lateral impression absent or shallow, broad, developed in posterior ⅔, not marked with large punctures. Puncturation at pronotal disc dense, double, consists of moderately large and fine punctures.

Prothoracic hypomeron slightly convex, without distinct impression, wrinkles and lateral border along outside. Basal fold weak. Intercoxal prosternal process impressed along entire length, broadened posteriorly. Antero-lateral portions of prosternum convex.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus; covered by dense, irregular, double puncturation (moderately large and fine punctures). Sutural stria absent at apical slope. Apex of elytron slightly drawn out (Fig. 4).

Elytral epipleura inclined outside, visible along entire length in lateral view, without setae.

Hind wings absent.

All tarsomeres 1–3 with entire sole, narrow in both sexes. In male (Fig. 2), they slightly broader than in female. Claw tarsomere without denticles beneath.

Pygidium drawn out apically, with impression in basal ½ only.

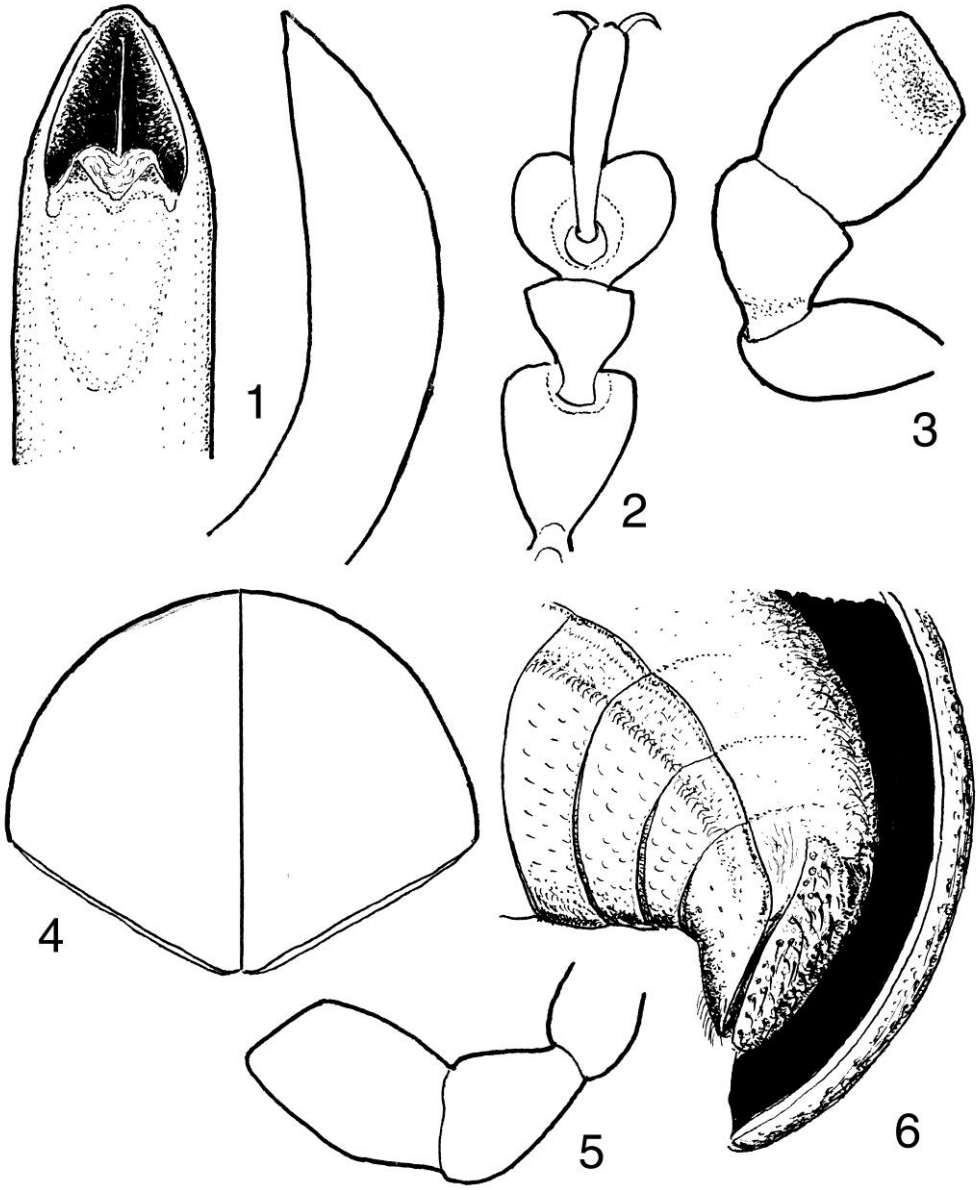
Last abdominal sternite convex in both sexes, drawn out in female (Fig. 6).

Aedeagus (Fig. 1) tube-shaped, moderately curved in lateral view, with apex triangular, without apical denticles. Flagellum simple, narrow, exposed from apical orifice of aedeagus.

Differential diagnosis

Timarchida is externally similar to *Colaphoptera* s.str. (*sensu* Kippenberg, 2012a) and *Lopatinica*, and differs from both in elytral apex and pygidium drawn out, and in elytral epipleura devoid of setae. The latter character is rare among European *Chrysolina*. Besides *Ch.* (*Timarchida*) *deubeli*, only one species, *Ch* (*Anopachys*) *eurina*, shares this character. *Timarchida* looks like representatives of the subgenus *Metallotimarcha* of the genus *Timarcha*, and differs from them in pronotum distinctly marginated, anterior coxal cavities opened, and metasternum between mid- and hind-coxal cavities as long as hind-coxa.

The subgenus includes the single species, *Ch.* (*Timarchida*) *deubeli* (Ganglbauer, 1897) occurring in S Carpathians. Body length: available specimens: 5.9 mm (male), 6.4 mm (female); 6.0–7.5 mm (after Ganglbauer, 1897); 6.2–8.0 mm (after Warchałowski, 2003).



***Timarchida* figures:** 1–6 – *Chrysolina deubeli*: 1–4 – male (Romania): 1 – aedeagus, dorsal and lateral view, 2 – fore-tarsus, 3 – maxillary palpus, 4 – elytra from behind; 5–6 – female, topotype (Romania: "Siebenbürgen"): 5 – maxillary palpus, 6 – apex of abdomen, lateral view. (Orig.)

Subgenus *Timarcholina* Bechyné, 1950a

Diagnosis

Dorsum: 1) entirely metallic, coppery, or 2) head and pronotum black with metallic reflection or dark metallic, elytra red or brown, with metallic reflection.

Last maxillary palpomere oval or parallel-sided, obliquely truncate apically, 1.3–1.7 X longer than broad, similar in both sexes, 1.1–1.3 X longer and 1.0–1.2 X broader than penultimate.

Antenna inserted 1.4–4.4 X closer to clypeus than to eye. Antenna narrow, with antennomeres 7–11 slightly broadened.

Eye vertical, narrow. Orbital line deep, long run along inner border of eye, not reaching antennal base in most species, orbital line shallow, short in *Ch. carinata* only.

Pronotum transversely very convex, broadest before mid-length, or at mid-length, or basally, with lateral sides rounded or sinuate (arc-shaped anteriorly and emarginated posteriorly). Pronotum laterally distinctly swollen, lateral impression narrow, moderately deep or shallow, developed along entire length. Anterior side of pronotum ciliate, marginated. Anterior setiferous pore absent (examined in *Ch. janczyki, Ch. templetoni*).

Prothoracic hypomeron glabrous, weakly or moderately convex, without lateral furrow, without wrinkles or with obsolete wrinkles along lateral side. Basal fold distinct in most species, weak in *Ch. andrewesi,* absent in *Ch. templetoni*. Prosternal appendix distinctly broadened posteriorly.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus or with very weak callus. Elytral punctures fine (sometimes obsolete), moderately large to large, arranged in 10 very sparse rows: there are abbreviated scutellar row and 9 regular entire rows. Rows 2–3, 4–5, 6–7, and 8–9 paired. Intervals flat, covered with very fine sparse punctures or almost impunctate in most species, or intervals through one very convex, keel-shaped (in *Ch. carinata* only).

Elytral epipleura oblique, visible along entire length in lateral view, ciliate apically.

Hind wings absent or strongly reduced, not longer than metathorax.

Tarsomeres 1 and 3 (or 1–3) in male fore- and mid-tarsi moderately broadened, broader than the respective tarsomeres in female in most species, tarsomeres 1–3 narrow in male of *Ch. templetoni* and *Ch. janczyki*. Tarsomeres 1–3 with entire sole in both sexes. Claw tarsomere with 2 denticles below.

Pygidium convex, without furrow, but with very weak longitudinal impression basally.

Last abdominal sternite almost similar in both sexes, convex, broadly truncate and marginated apically.

Aedeagus tube-shaped, moderately curved dorso-ventrally, with apex of different shapes, without apical denticles in most species, with small denticles in *Ch. templetoni*. Flagellum simple, thin, exposed.

Differential diagnosis

Subgenus *Timarcholina* is endemic for India and Sri Lanka. It resembles externally the members of the genus *Timarchomima* and differs in elytral punctures very sparse, arranged in regular rows, and in metasternum entirely marginated anteriorly (cf. Figs. 18 and 19). However, *Timarchomima clavareaui* also has metasternum marginated anteriorly.

Key to species

1(2) The intervals between elytral rows of punctures through one very convex, keel-shaped. Body narrowly oval (male) or narrowly obovate (female); blackish bronze with elytra (including epipleura) brown with golden reflection. Pronotal lateral impression forming narrow, moderately deep (female) or moderately shallow (male) furrow. Length: 7.8 mm (male), 8.8 mm (female). Figs. 17, 31–34. S India.

Ch. carinata (Jacoby, 1903)

2(1) All intervals between elytral rows of punctures flat.

3(8) Middle of pronotal disc impunctate or almost so.

4(5) Body broadly obovate, almost hemispherical, with apical end of elytra not tapering. Pronotum cordate. Pronotal lateral impression forming broad, shallow fold along entire length. Elytra covered by moderately large, fine to obsolete punctures. Head and pronotum bronze or black with bronze reflection, elytra (including epipleura) rufous or brown, with bronze reflection. Length: 6.3–8.2 mm (male), 7.4–8.2 mm (female). Figs. 1–6, 18. Sri Lanka.

Ch. templetoni (Baly, 1860)

5(4) Body oblong-elongate, tapering towards apex of elytra. Pronotum with lateral sides evenly rounded. Elytra covered by moderately large punctures. Species rather similar to each other externally. In doubtful cases, the examination of male aedeagus is necessary.

6(7) Dorsal side nearly unicolorous: coppery, head, lateral calli and partly disc of pronotum, epipleura and lateral side of elytra with golden green reflection. Antennal insertion 1.8 X closer to clypeus than to eye. Aedeagus narrowly blunted at the end. Pronotal lateral impressions forming very shallow, irregular fovea. Elytral punctures moderately large. Length: 8.5 mm (male). Figs. 26–30. India.

Ch. krishnu (Baly, 1862)

7(6) Dorsal side distinctly bicolorous: 1) head and pronotum black with greenish bronze reflection, elytra (including epipleura) red with greenish bronze reflection, or 2) head and pronotum bluish green, elytra brown with bluish green reflection. Antennal insertion 3.4 X closer to clypeus than to eye. Aedeagus widely blunted at the end. Pronotal lateral impression forming narrow, shallow furrow. Elytral punctures large. Length: 8.4 mm (male), 8.8–9.0 mm (female). Figs. 20–22. S India.

Ch. semifulva (Jacoby, 1893)

8(3) Middle of pronotal disc covered by sparse, but distinct punctures.

9(10) Pronotal lateral callus less convex, lateral impression broad, shallow along entire length. Aedeagus rounded apically, slightly turned down at apex in lateral view. Head and pronotum

black with golden green reflection, elytra (including epipleura) red with golden green reflection. Elytral punctures large. Length: 8.3 mm (male), 8.9 (female). Figs. 23–25. S India.

Ch. andrewesi (Jacoby, 1903)

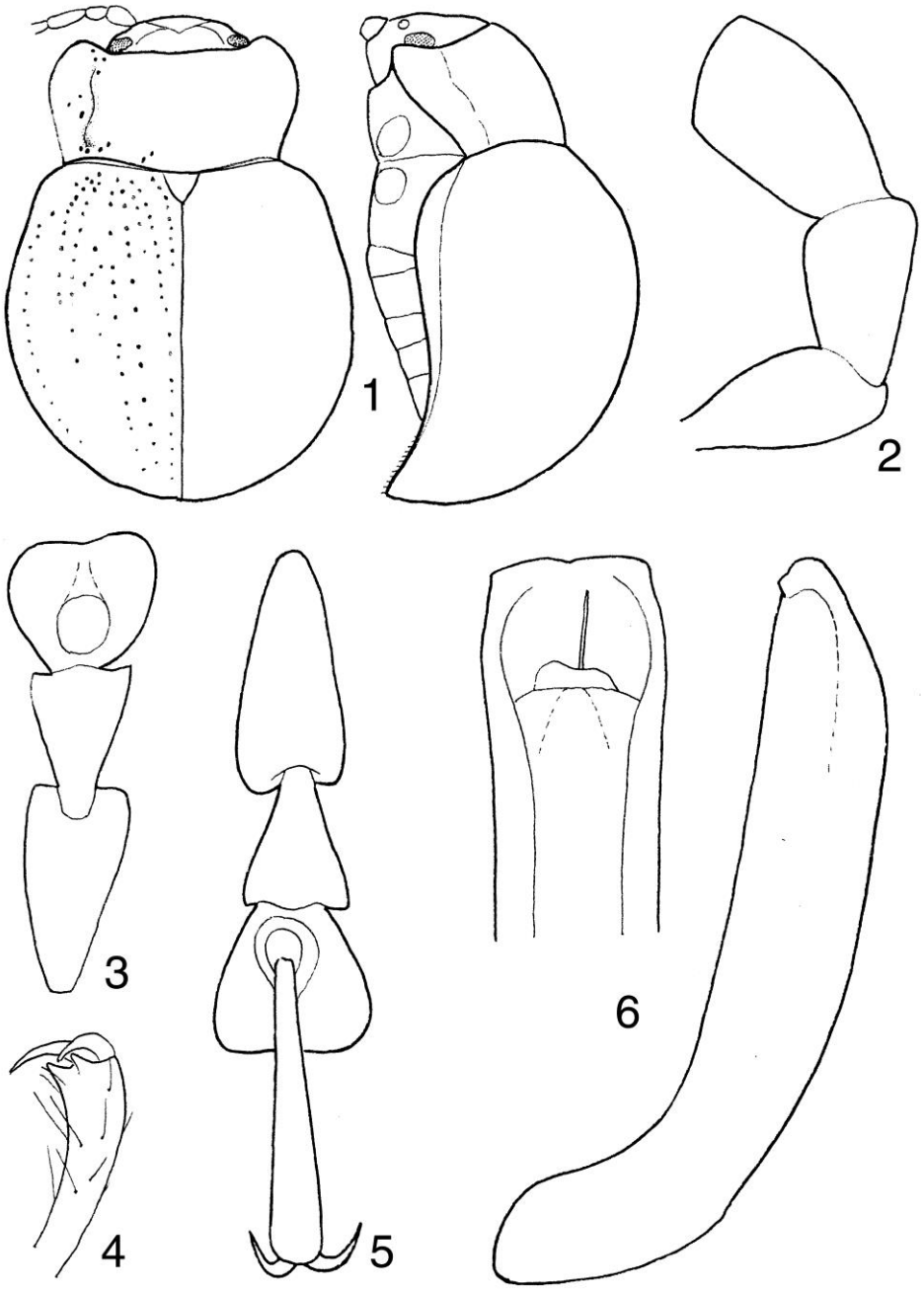
10(9) Pronotal lateral callus more convex, lateral impression with distinct fold at bottom.

11(12) Body very convex, hemispherical in lateral view. Pronotal surface including lateral impressions smooth, impunctate, or with only few punctures. Head and pronotum bronze or black with bronze reflection, elytra (including epipleura) rufous or brown, with bronze reflection. Length: 6.3–8.2 mm (male), 7.4–8.2 mm (female). Figs. 7–11. Sri Lanka.

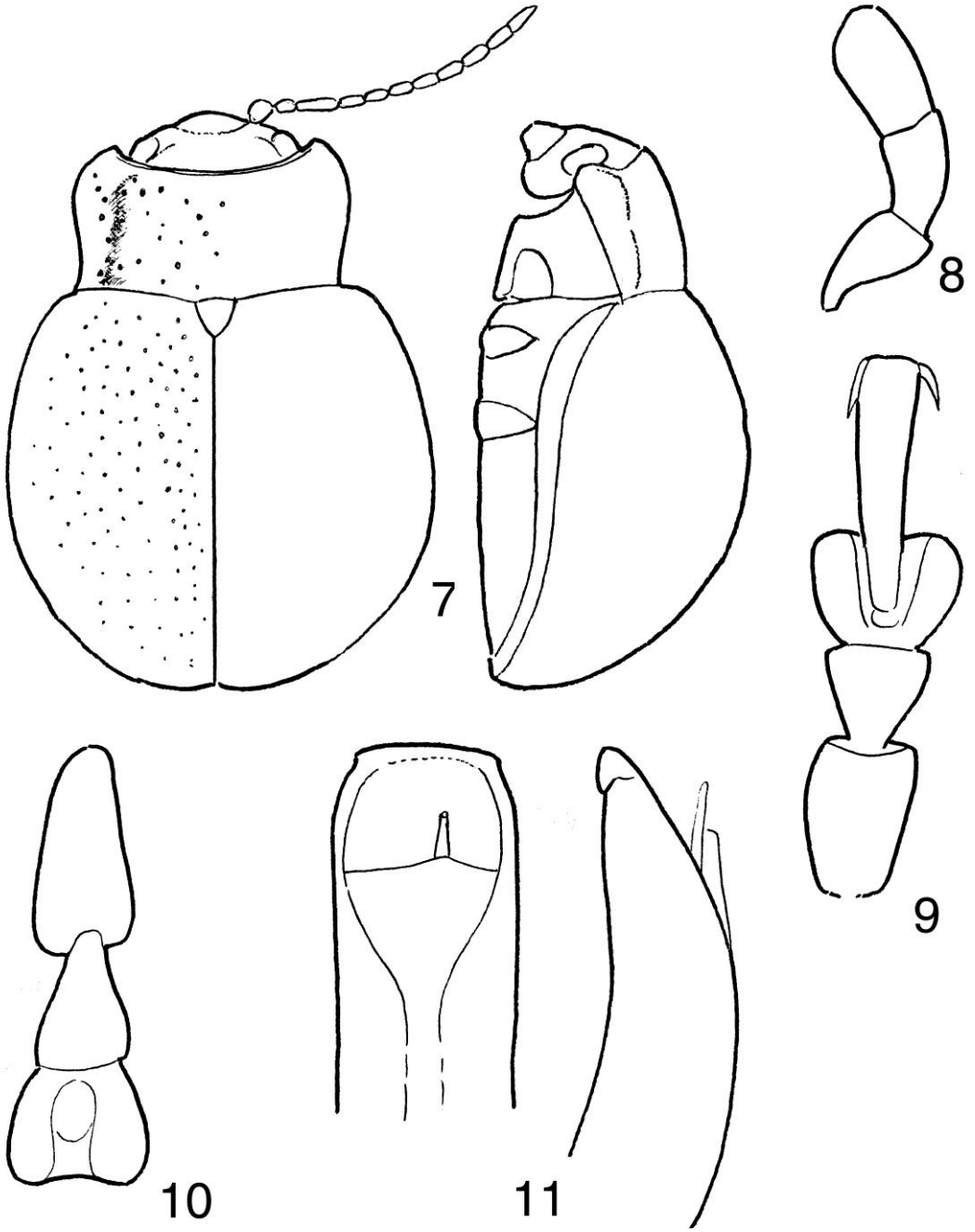
Ch. templetoni (Baly, 1860) (see also couplet 4)

12(11) Body moderately convex in lateral view. Pronotal surface dull, lateral impression covered by numerous large punctures. Aedeagus with broad apical lobe, which is S-shaped in lateral view. Head and pronotum dark green, elytra dark red with distinct violet or bluish green reflection. Elytral punctures large. Length: 9.3 mm (male, holotype), 9.7 mm (male, paratype). Figs. 12–16. India

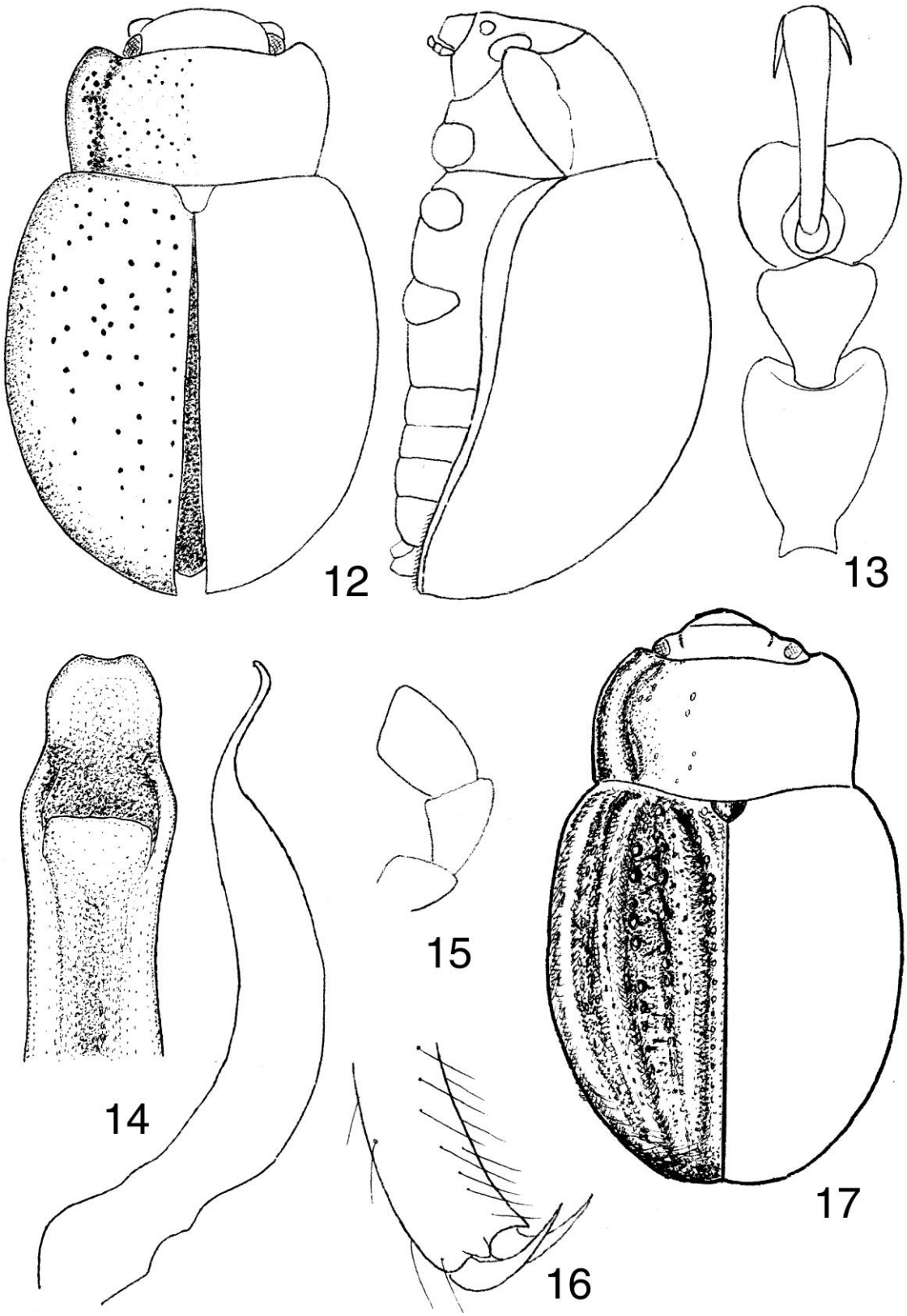
Ch. janczyki Daccordi, 1980a



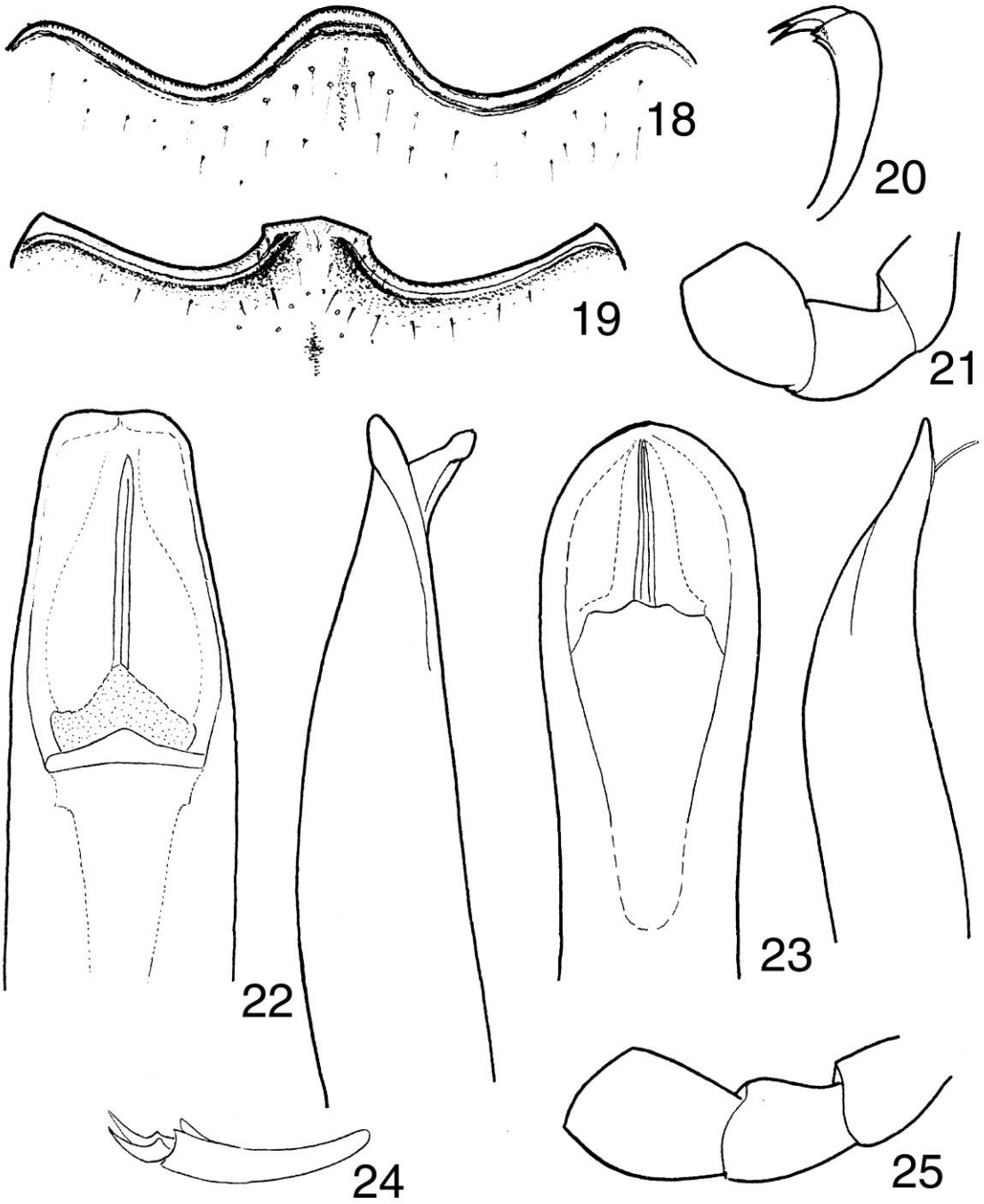
***Timarcholina* figures 1–6**: *Chrysolina templetoni*, male (Sri Lanka): 1 – total dorsal and lateral view, 2 – maxillary palpus, 3 – fore-tarsus, 4 – 4th hind-tarsomere, 5 – hind-tarsus, 6– aedeagus, dorsal and lateral view. (Orig.)



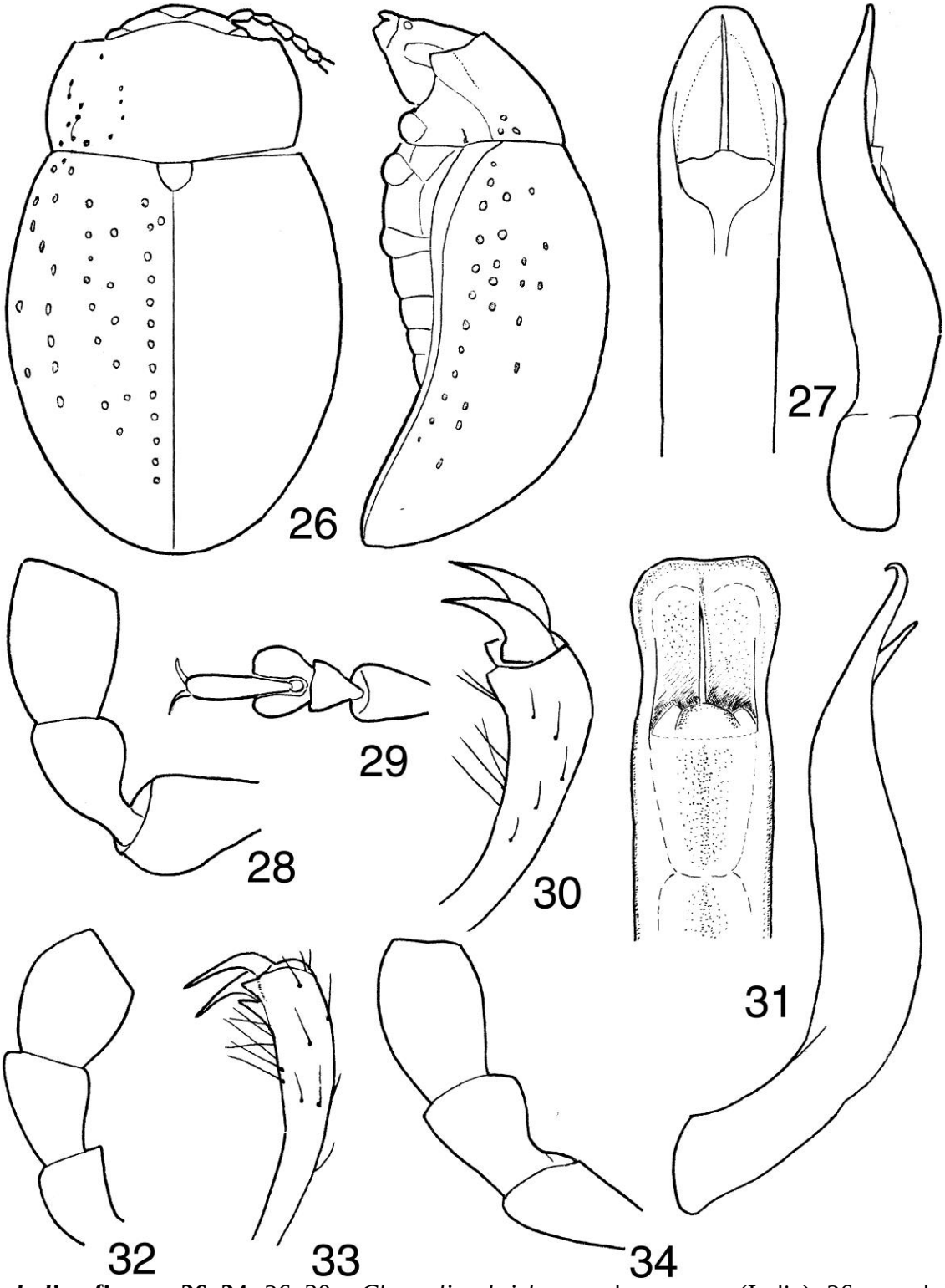
***Timarcholina* figures 7–11**: *Chrysolina templetoni*, male, another specimen (Sri Lanka): 7 – total dorsal and lateral view, 8 – maxillary palpus, 9 – fore-tarsus, 10 – 4th hind-tarsomere, 11 – aedeagus, dorsal and lateral view. (Orig.)



***Timarcholina* figures 12–17:** 12–16 – *Chrysolina janczyki*, male, holotype (India): 12 – total dorsal and lateral view, 13 – fore-tarsus, 14 – aedeagus, dorsal and lateral view, 15 – maxillary palpus, 16 – 4th hind-tarsomere; 17 – *Ch. carinata*, female (S India), total dorsal view. (Orig.)



***Timarcholina* figures 18–25:** 18–19 – anterior part of metasternum: 18 – *Chrysolina templetoni*, male (Sri Lanka), 19 – *Timarchomima indica*, male (India); 20–22 – *Ch. semifulva*, male, syntype (India: Utakamand): 20 – 4th fore-tarsomere, 21 – maxillary palpus, 22 – aedeagus, dorsal and lateral view; 23–25 – *Ch. andrewesi*, male, syntype (S India): 23 – aedeagus, dorsal and lateral view, 24 – 4th fore-tarsomere, 25 – maxillary palpus. (Orig.)



***Timarcholina* figures 26–34:** 26–30 – *Chrysolina krishnu*, male, syntype (India): 26 – total dorsal and lateral view, 27 – aedeagus, dorsal and lateral view, 28 – maxillary palpus, 29 – fore-tarsus, 30 – 4th fore-tarsomere; 31–34 – *Ch. carinata*: 31–33 – male, syntype (S India): 31 – aedeagus, dorsal and lateral view, 32 – maxillary palpus, 33 – 4th fore-tarsomere, 34 – female, topotype (S India), maxillary palpus. (Orig.)

Subgenus *Timarchomela* Achard, 1922

Diagnosis

Dorsum always dull or sericeous, distinctly shagreen, entirely black or dark metallic, mostly bronze or coppery, rarely blue.

Last maxillary palpomere narrow: 1) elongate oval, 1.5 X longer than broad, as wide as penultimate one and 1.1 X shorter than latter, or 2) slightly securiform, 1.5 X longer than broad, 1.1 X broader than penultimate one and 1.3 longer than latter; similar in both sexes.

Antenna inserted 3.5–4.3 X closer to clypeus than to eye. Antenna narrow from the base up to the apex, or with antennomeres 7–11 slightly broadened.

Eyes vertical, moderately narrow. Orbital lines distinct, far from reaching the antennal bases in most species; orbital lines absent in *Ch. confucii*.

Pronotum transversely convex to very convex, swollen in different species; broadest before mid-length, or at mid-length, or basally, with lateral sides rounded or sinuate (arc-shaped anteriorly and emarginated posteriorly). Pronotum laterally distinctly swollen, with lateral impressions absent or obsolete, hardly visible, with or without large punctures at inner border of lateral callus. Anterior side of pronotum ciliate, marginated. Anterior setiferous pore absent (examined in *Ch. costulata, Ch. aeneolucens, Ch. baoshanica, Ch. confucii, Ch. dalia, Ch. lii, Ch. oxanae*).

Prothoracic hypomeron weakly or moderately convex, without lateral furrow, without wrinkles or with obsolete wrinkles along lateral side. Basal fold shallow, or obsolete, or absent in different species. Prosternal appendix more or less broadened posteriorly, covered by wrinkled punctures, with or without longitudinal impression.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus. Elytral puncturation different: 1) in *Ch. costulata*: punctures moderately large or fine, arranged in regular paired rows, or 2) in all other species: punctures fine to obsolete, arranged in irregular rows which hardly visible among irregular punctures in intervals, sometimes elytra look like impunctate. Intervals flat in most species, narrow intervals between rows of each pair are slightly convex in *Ch. costulata* and *Ch. confucii*.

Elytral epipleura oblique, visible along entire length in lateral view, ciliate apically. Apical setae more or less numerous, sometimes very sparse. Only one seta is visible at each elytron in the holotype of *Ch. confucii*. Setae are absent in the type specimens of *Ch. doeberli* (according original description of *Doeberlia subopaca*). Reduction of setae may be in vivo or post mortem.

Hind wings absent.

Tarsomeres 1–3 narrow, with entire sole in both sexes, in male they are slightly broader than in female. Claw tarsomere without denticles.

Pygidium convex, without furrow, but with weak longitudinal impression basally in most species, or with sharp furrow along entire length (in *Ch. costulata* only).

Last abdominal sternite almost similar in both sexes, convex, broadly truncate in male (slightly emarginated in *Ch. dalia*), rounded in female, marginated along apical border.

Aedeagus tube-shaped, with long curved apical lobe, or with apex anchor-shaped, or with apex simple. Flagellum mostly simple, thin, exposed; invisible in *Ch. gansuica*.

Females of *Ch. costulata* and *Ch. dalia* are ovoviviparous. Developed larvae have been observed within the abdomen of females.

Differential diagnosis

Subgenus *Timarchomela* inhabits mostly Yunnan Province of China, with two species, *Ch. confucii* and *Ch. oxanae*, from Sichuan, and three species, *Ch. gansuica*, *Ch. nigrorugosa* and *Ch*. sp. 48 from Gansu. The subgenus is characterized by: dorsum dull or sericeous, dark metallic or black, without distinct lateral impression of pronotum, with fine to obsolete elytral punctures in most species (except *Ch. costulata*), without humeral calli and hind wings, with maxillary palpi narrow, similar in both sexes, tarsomeres 1–3 narrow, with entire sole in both sexes. Several species have aedeagus with long narrow apical projection, which is more or less curved dorsally.

Key to species

1(6) Pygidium with impression along entire length or almost entire length except near apex. Last maxillary palpomere narrow, elongate oval. Pronotal disc covered by dense distinct fine punctures.

2(3) Body large. Species from Yunnan. Pygidium with sharp furrow along entire length. Prothoracic hypomeron with developed basal fold. Elytral punctures arranged in regular rows, which are paired as follows: 2nd with 3rd, 4th with 5th, 6th with 7th, 8th with 9$^{th.}$ Narrow intervals between rows of each pair are slightly convex, others flat. Dorsum dark bronze, antennae, labrum, mandibles, maxillary palpi, and legs dark metallic. Pronotum transversely very convex, swollen. Pronotal lateral callus separated interiorly by several large punctures along entire length. Anterior projection of metasternum between coxae with swollen marginal callus separated by very deep furrow. Length: 10.2–10.8 mm (available females); 8.5–11.0 mm (according to Chen, 1934). Figs. 1–6. China (Yunnan).

Ch. costulata (Achard, 1922)

3(2) Body small. Species from Gansu. Pygidium with shallow but distinct impression along almost entire length. Prothoracic hypomeron with shallow, oblique basal fold. Elytral punctures fine, arranged in slightly paired rows, which confused on disc. Rows scarcely visible because of densely wrinkled background. Pronotum transversely moderately convex. Pronotal lateral callus separated interiorly by several large punctures and weak impressions only at base and apex. Anterior projection of metasternum between coxae with narrow marginal callus separated by fine furrow.

4(5) Aedeagus almost straight at mid-length, moderately curved only at base and apex (in lateral view). Dorsum differently colored: 1) dull, black, with very weak blue tint on frons, pronotal calli, and elytral lateral sides (some specimens including holotype), 2) shining, bronze, golden green, violet, bluish black or coppery. Length: 5.5–6.9 mm. China (Gansu).

Remark. This species was originally described based on the single aberrant female specimen (with wrinkled background of elytra). Smooth surface of elytra is more typical for this species. It is similar to the members of the subgenus *Ch.* (*Pezocrosita*) (*brevilata*) group

in external characters and aedeagus structure and differs in the absence of wide lateral band of large punctures which separates pronotal lateral callus. Fig. 17.

Ch. nigrorugosa Lopatin, 2005b

5(4) Aedeagus strongly arc-shaped in lateral view. Dorsum green, elytra with golden reflection, with diffuse purple pattern: spot on vertex, stripes at elytral basal, lateral, and sutural sides. Length 5.4 mm. Fig. 18. China (Gansu).

Ch. sp. 48

6(1) Pygidium convex, with only shallow impression at base. Pronotal disc with sparse microscopic punctures or absolutely impunctate. Prothoracic hypomeron with very weak basal fold or absolutely without fold. Elytral punctures fine, arranged in irregular rows, which hardly visible among irregular punctures in intervals, sometimes elytra with only obsolete punctures, look like impunctate.

7(22) Antennae, labrum, mandibles, maxillary palpi, and legs dark metallic or black.

8(11) Last maxillary palpomere oval, similar to penultimate one in length and width.

9(10) Dorsum dull, black, with only obsolete, very fine punctures on pronotum and elytra. Pronotum transversely convex, but not swollen. Pronotal lateral calli weakly convex, separated interiorly by impressions wide, very shallow, without punctures. Elytral surface flat. Anterior projection of metasternum between coxae with narrow marginal callus separated by fine furrow. Aedeagus with 2 large denticles before the apex ventrally. Length 8.3–9.1 mm (male), 8.6–9.6 mm (female). Fig. 16. China (Gansu).

Ch. gansuica Lopatin, 2006

10(9) Dorsum bronze with bright shining (in male, holotype, after original description) or dull, black (in female, paratype, examined), with numerous large punctures replacing pronotal lateral impression, and with some smaller punctures at elytra, they forming closely paired rows of moderately large punctures, with similar numerous punctures in intervals, punctures shallow. Pronotum transversely convex, but not swollen. Pronotal lateral calli weakly convex, separated interiorly by impressions wide, very shallow, present in anterior ¼ and posterior ½, with numerous large punctures. Elytral surface flat. Anterior projection of metasternum between coxae with narrow marginal callus separated by fine furrow. Aedeagus – fig. 25. China (Yunnan).

Ch. lii Daccordi et Ge in: Daccordi, Ge, Cui, Yang, 2011

11(8) Last maxillary palpomere slightly securiform, broadened towards apex.

12(19) Aedeagus with long narrow apical lobe.

13(18) Apical lobe of aedeagus strongly curved dorsally.

14(15) Dorsum dark coppery or dark bronze. Pronotum transversely very convex, swollen. Pronotal lateral callus separated interiorly by numerous moderately large punctures along entire length. Apical lobe of aedeagus shallowly bifurcated. Elytral intervals flat. Anterior projection of metasternum between coxae with swollen marginal callus separated by very deep furrow. Length: 8.2 mm (male), 9.2–9.3 mm (female); 7.5–9.5 mm (according to Chen, 1934). Fig. 8. China (Yunnan).

Ch. aeneolucens (Achard, 1922)

15(14) Dorsum black. Pronotum transversely convex, but not swollen. Apical lobe of aedeagus deeply bifurcated.

16(17) Pronotal lateral impression shallow, without punctures. Elytral intervals between rows of each pair are slightly convex. Length: 10.7 mm (male), 9.9 mm (female). Figs. 11, 12. China (Hunan).

Ch. doeberli Daccordi et Yang in: Ge, Daccordi, Yang, 2009

17(16) Pronotal lateral impression shallow, with group of large punctures in posterior ½ and anteriorly. Elytral intervals flat. Length 6.9 mm (male), 10.0 mm (female). Figs. 13–15. China (Yunnan).

Ch. maximi Lopatin, 2011

18(13) Apical lobe of aedeagus slightly curved dorsally, slightly emarginated at top. Pronotum transversely convex, but not swollen. Pronotal lateral impression very shallow, hardly visible, more distinct near base, without large punctures. Elytral intervals flat. Anterior projection of metasternum between coxae with swollen marginal callus separated by very deep furrow. Dorsum dark bronze. Length 8.8 mm (male, holotype). Female is unknown. This species is very similar in appearance to *Ch. dalia*, and differs only in aedeagus structure. Figs. 9, 10. China (Yunnan).

Ch. baoshanica Lopatin, 2009

19(12) Aedeagus without long narrow apical lobe.

20(21) Species from Yunnan. Aedeagus with short, broad, slightly anchor-shaped apical lobe, which rounded at top. Pronotum transversely convex, but not swollen. Pronotal lateral impression very shallow, hardly visible, without large punctures. Elytral intervals flat. Anterior projection of metasternum between coxae with swollen marginal callus separated by deep furrow. Dorsum dark bronze or dark coppery. Length 7.1–7.3 mm (male), 7.6 mm (female). This species is very similar in appearance to *Ch. baoshanica*, and differs only in aedeagus structure. Fig. 7. China (Yunnan).

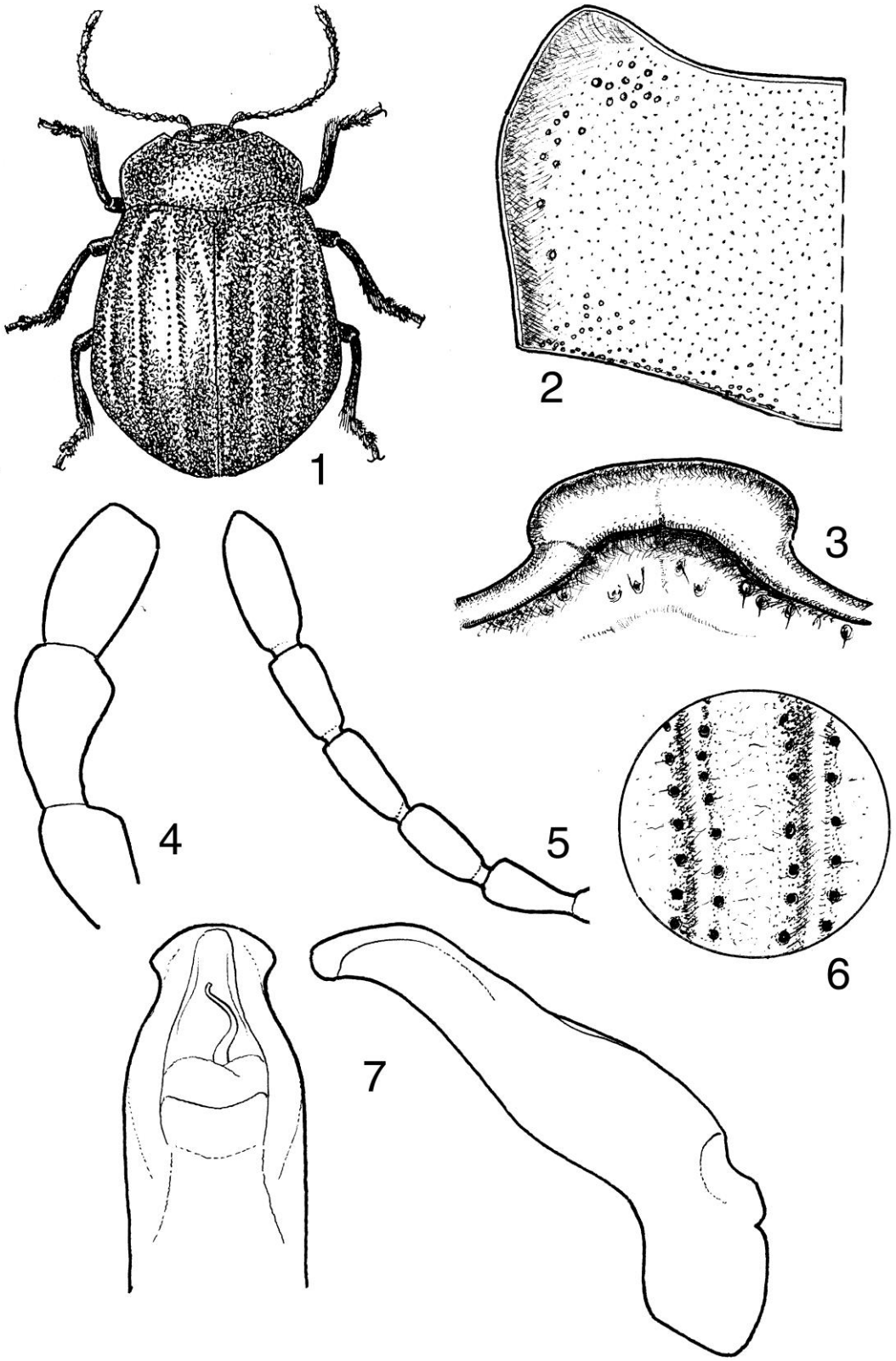
Ch. dalia Chen et Wang, 1984

21(20) Species from Sichuan. Aedeagus with apex simple, obtusely rounded. Pronotum transversely convex, but not swollen; disc densely minutely punctulate, punctules as large as cells of microsculpture. Pronotal lateral impression shallow, moderately deepened near base, covered by several large punctures, which partly confluent near base. Elytra with irregular rows of very fine, dense punctures, intervals flat. Dorsum black. Length 7.1 mm (male), female unknown. Figs. 19–21. China (Sichuan).

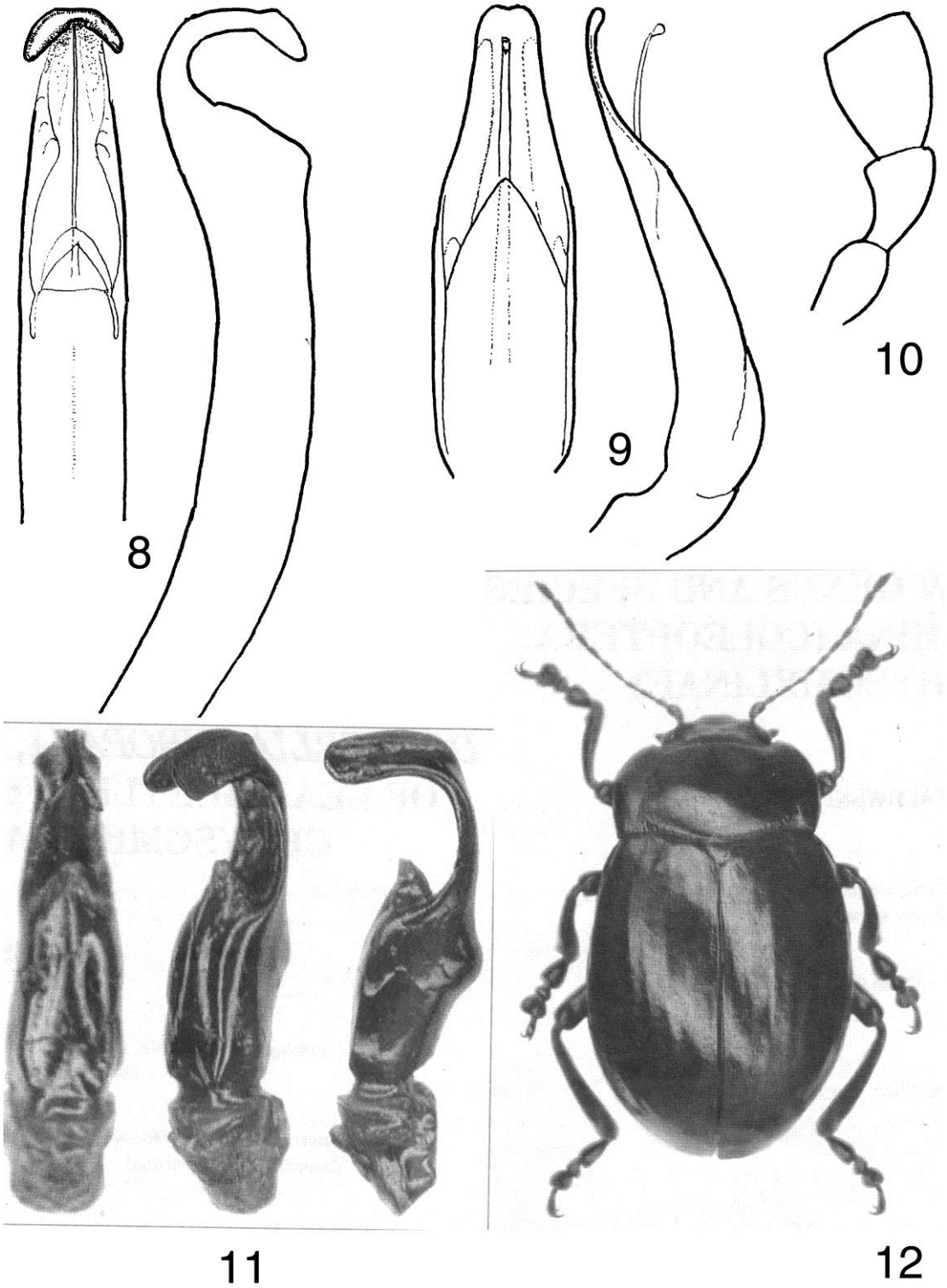
Ch. oxanae Lopatin, 2013

22(7) Antennae, labrum, mandibles, maxillary palpi, and legs rufous in holotype (female) and additional males, or with tibiae and femora dark brown (in additional female). Last maxillary palpomere narrow, elongate oval, truncate apically, similar to penultimate one, similar in both sexes. Pronotal lateral impression broad, very shallow, hardly visible, without large punctures. Elytral intervals between rows of each pair are slightly convex. Anterior projection of metasternum between coxae with low marginal callus separated by shallow furrow. Dorsum sericeous, dark brassy in holotype, or head and pronotum dark brown with bronze tint, scutellum reddish, and elytra black with bronze tint in additional male, or dorsum dark blue in additional female. Male tarsomeres 1–3 strongly broadened in fore- and mid-tarsi, moderately broadened in hind-tarsi. Length 8.0 mm (holotype, female), 8.4 mm (additional female), 7.2 mm (additional males). China (Sichuan, Yunnan).

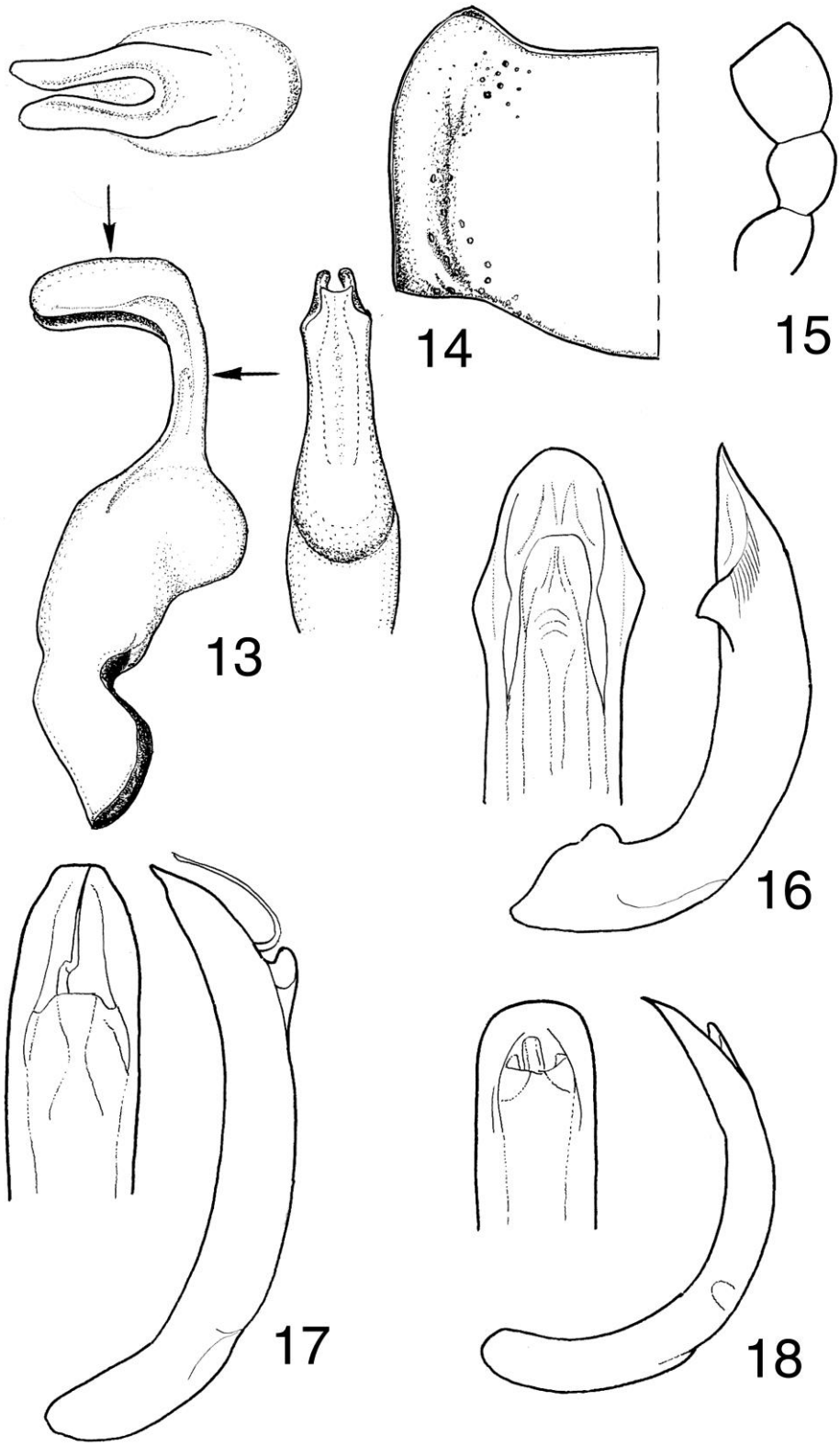
Ch. confucii Lopatin, 2007



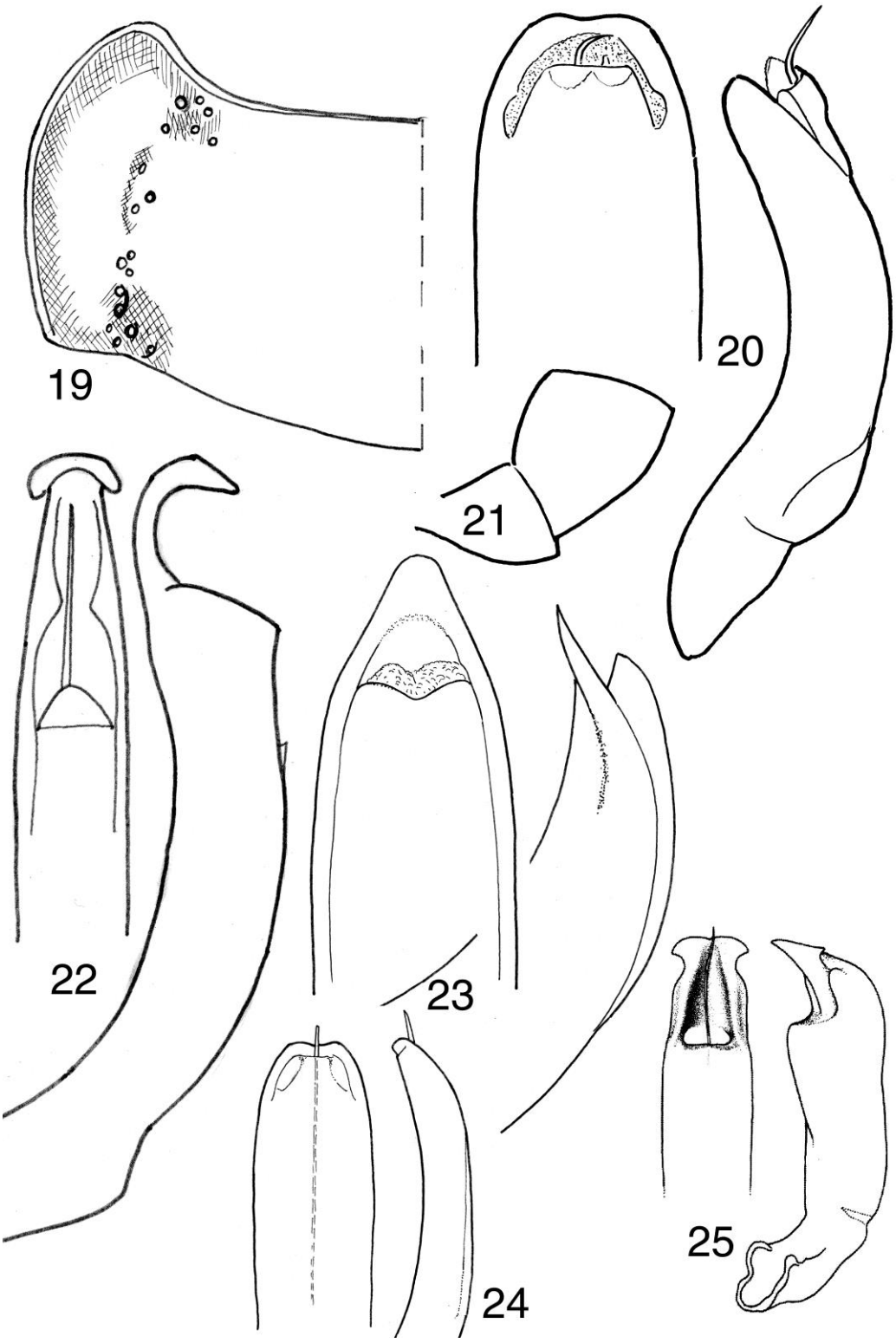
Timarchomela **figures 1–7**: 1–6 – *Chrysolina costulata*: 1 – dorsal view, 2–6 – female, syntype (China; Yunnan): 2 – pronotum, 3 – anterior projection of metasternum, 4 – maxillary palpus, 5 – antennomeres 7–11, 6 – relief of elytral disc; 7 – *Ch. dalia*, male (China: Yunnan), aedeagus, dorsal and lateral view. (After: Chen, 1934: 1; others – orig.)



***Timarchomela* figures 8–12**: 8 – *Chrysolina aeneolucens*, male (China: Yunnan), aedeagus, dorsal and lateral view; 9–10 – *Ch. baoshanica*, male, holotype (China; Yunnan): 9 – aedeagus, dorsal and lateral view, 10 – maxillary palpus; 11–12 – *Ch. doeberli*, male (holotype *Doeberlia subopaca*, China: Yunnan): 11 – aedeagus, dorsal, dorso-lateral, and lateral view), 12 – dorsal view. (After: Warchałowski, 2007: 11, 12; others – orig.)



***Timarchomela* figures 13–18:** 13–15 – *Chrysolina maximi*, male, holotype (China: Yunnan): 13 – aedeagus, lateral view and two projections in ventral view, 14 – pronotum, 15 – maxillary palpus; 16–18 – aedeagus, dorsal and lateral view: 16 – *Ch. gansuica* (China: Gansu), 17 – *Ch. nigrorugosa* (China: Gansu), 18 – Ch. sp. 48 (Gansu). (Orig.)



Timarchomela **figures 19–25:** 19–21 – *Chrysolina oxanae*, male (holotype, China: Sichuan): 19 – pronotum, 20 – aedeagus, dorsal and lateral view, 21 – maxillary palpus; 22–25 – aedeagus, dorsal and lateral view: 22 – *Ch. aeneolucens*, male (syntype, China, Yunnan), 23 – *Ch. costulata* (Yunnan), 24 – *Ch. confucii* (Sichuan), 25 – *Ch. lii* (holotype, Yunnan). (After: Daccordi, et al., 2011: 25; others – orig.)

Subgenus *Timarchoptera* Motschulsky, 1860a

Diagnosis

Dorsum moderately shining or dull, head and pronotum metallic (green, blue or bronze), coloration of elytra different: 1) greenish brown marginated basally and laterally with red, or 2) entirely red or orange, or 3) entirely metallic: coppery, bronze, bronze violet, brassy green, bluish green, dark violet, or purple marginated with golden green basally, laterally and along suture. Legs and ventral side entirely dark metallic or pitchy-black with metallic tint.

Last maxillary palpomere short, broadly oval, 1.2 X longer than wide, truncate at apex, hardly narrower than penultimate one, similar in both sexes.

Antenna inserted closer to clypeus than to eye; not reaching hind coxa; with antennomeres 6–11 moderately broadened.

Orbital lines broad and deep, not reaching antennal bases.

Pronotum broadest at mid-length or before mid-length; with lateral sides rounded and slightly emarginated before posterior angles or evenly rounded; pronotum moderately swollen laterally along entire length, with lateral impression absent, obsolete, or very shallow, covered by numerous large punctures. Pronotal disc covered by dense punctures. Anterior side of pronotum marginated and ciliate. Anterior setiferous pore absent.

Prothoracic hypomeron weakly convex or flat, reticulate, dull, without lateral impression, distinct wrinkles and outer border. Basal fold very weak or absent. Intercoxal prosternal process with medial longitudinal impression in most species, convex in one undescribed species from the Far East.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus. Elytral puncturation dense, homogeneous, wholly irregular, or each elytron with 3 or 9–10 convex calli and punctures mostly arranged in irregular rows in intervals between calli.

Elytral epipleura inclined outside, visible along entire length in lateral view, ciliate apically.

Hind wings strongly reduced, as long as metathorax.

Tarsi: all tarsomeres 1–3 with entire sole in both sexes; in male: fore- and mid- tarsomeres 1 and 3 and hind-tarsomere 1 moderately broadened; in female: tarsomeres 1–3 narrow. Claw tarsomere without denticles beneath.

Pygidium with longitudinal furrow along entire length in *Ch. haemochlora* and one undescribed species from the Far East, without impression in *Ch. soiota* and *Ch. lomakini*.

Last abdominal sternite convex, with apical margin broadly emarginated in male, or with rounded apical margin in female.

Aedeagus broad, curved, flattened, with apical lobe spade-shaped. Flagellum narrow, simple, tube-shaped, exposed.

Differential diagnosis

The present subgenus is morphologically close to *Chrysocrosita* and differs from the latter in: 1) last maxillary palpomere slightly longer than broad, 2) female tarsomere 1 with entire sole. It is interesting, that these subgenera both have one species, namely *Ch.* (*Timarchoptera*) *soiota* and *Ch.* (*Chrysocrosita*) *alaschanica*, with elytral puncturation mostly irregular and interrupted by convex longitudinal calli.

Timarchoptera differs from *Threnosoma* in: 1) absence of anterior setiferous pore on pronotum (difference from all *Threnosoma* except *Ch. anceyi*), 2) absence of lateral impression on prothoracic hypomeron, 3) absence of deep basal fold on prothoracic hypomeron (difference from all *Threnosoma* except *Ch. cribrosa* and *Ch. timarchoides*), 4) aedeagus with spade-shaped apical lobe.

Key to species and subspecies

1(6) Elytra with homogeneous puncturation.

2(3) Elytra greenish brown marginated basally and laterally with red or elytra entirely red or orange. Head and pronotum green, blue, or bronze. Aedeagus with apical lobe triangular, apical orifice elongate-oval, dorsal side flat before apical orifice. Elytral base slightly broader than pronotal base or as broad as the latter. Pygidium with longitudinal furrow along entire length. Length 7.6–8.5 mm (males, 12 spec. measured), 8.3–9.2 mm (females, 9 spec. measured). Figs. 1–3. Altai, Sayans, Transbaikalia, N Mongolia.

Ch. haemochlora (Gebler, 1823)

3(2) Elytra entirely metallic. Aedeagus with apical lobe roundly truncate or rounded.

4(5) Dorsal side bronze or bronze violet. Ventral side and legs pitchy black with metallic tint, antennae pitchy black with antennomeres 1–2 rufous ventrally. Lateral side of pronotum emarginate before base, because of that posterior angles projecting laterally. Pronotal disc covered by double puncturation (large and fine punctures). Elytral base broader than pronotal base. Sutural furrow very weak at apical slope of elytron. Pygidium without longitudinal furrow. 3rd tarsomere slightly broader than 1st tarsomere. Aedeagus with apical lobe roundly truncate, apical orifice elongate-oval, dorsal side with broad furrow before orifice. Length 7.8–9.1 mm (male), 8.6 mm (female). Fig. 8. W Sayans.

Ch. lomakini Mikhailov, 2002a

5(4) Head and pronotum green with bluish green lateral sides of pronotum, elytra purple marginated with golden green basally, laterally and along suture, ventral side of body blue, legs green, antennae entirely blue. Lateral side of pronotum evenly convex, without emargination before base, because of that posterior angles not projecting laterally. Pronotal disc covered by almost homogeneous punctures. Elytral base not broader than pronotal base. Sutural furrow distinct at apical slope of elytron. Pygidium with distinct longitudinal furrow. 3rd tarsomere slightly narrower than 1st. Aedeagus with apical lobe rounded, apical orifice short, rounded, dorsal side with narrow furrow before orifice. Length 7.8 mm (male). Female is unknown. This species externally, mostly by the dorsal coloration, looks like *Ch.* (*Chrysocrosita*) *spectabilis* and differs in the last maxillary palpomere slightly longer than wide, and aedeagus with spade-shaped apical lobe. Far East: Khabarovsk Krai (Komsomolsky

Distr.) – 1500km eastward from the areas of the other members of the present subgenus! Fig. 4.

Ch. sp. 8

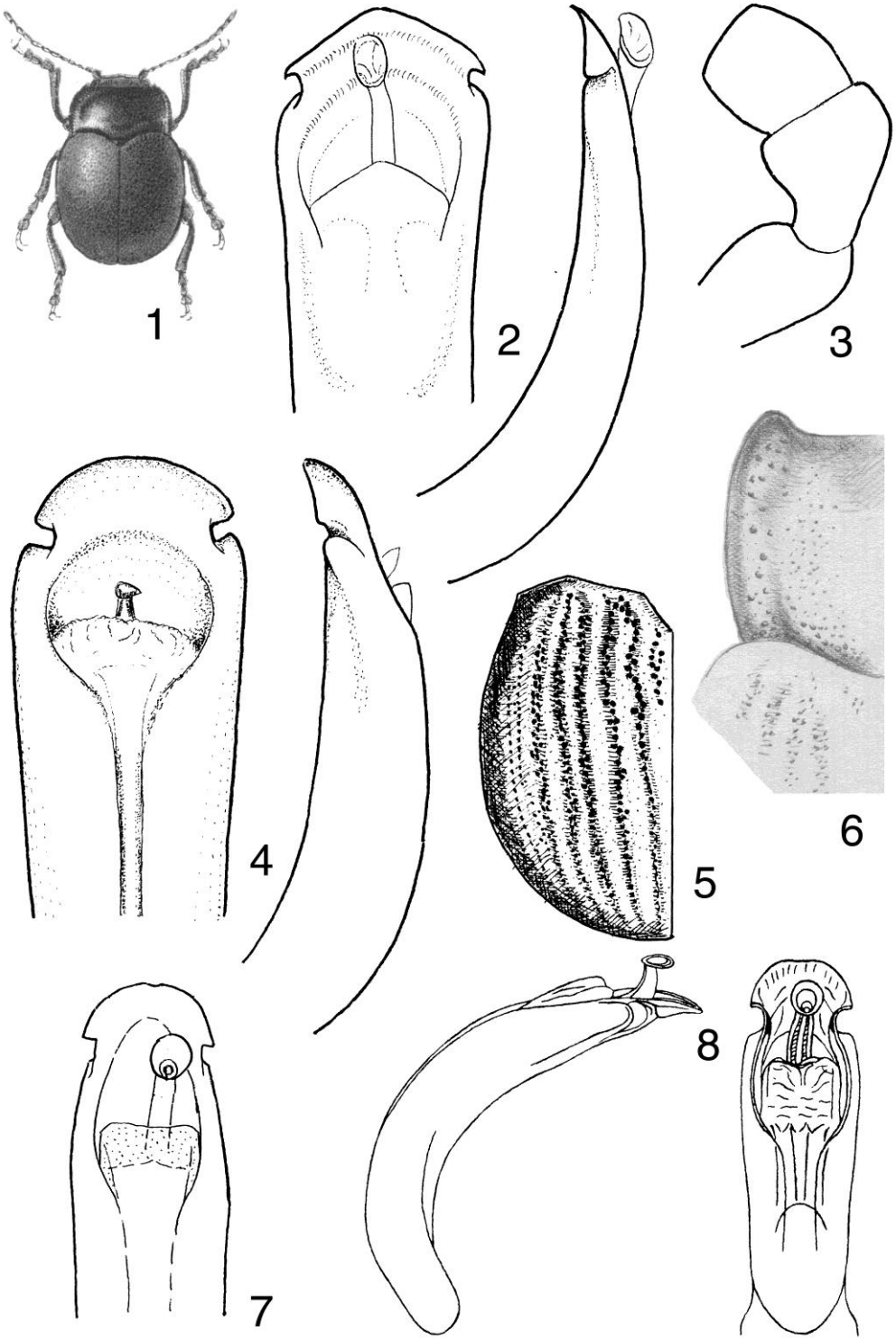
6(1) Elytral puncturation is intersected by convex longitudinal calli. Aedeagus with apical lobe rounded, apical orifice elongate-oval, dorsal side with broad furrow before orifice. Elytral base broader than pronotal base. Pygidium without longitudinal furrow.

7(8) Elytron with 9–10 convex or slightly keel-shaped calli; punctures arranged in 1–3 irregular rows in intervals between calli. Dorsal side brassy green, bluish green, bronze or dark violet. Length 6.4–9.2 mm (male), 8.2–9.6 mm (female). Figs. 5–7. Sayans east of the right bank of the Yenisei.

Ch. soiota soiota (Jacobson, 1924)

8(7) Elytron with 3 convex calli in narrow intervals between rows 2 and 3, 4 and 5, 8 and 9. Other intervals covered by irregular punctures. Dorsal side bronze or coppery. Length 7.4–7.8 mm (male). Female is unknown. W Sayan west of the left bank of the Yenisei.

Ch. soiota khakassa Mikhailov, 2002a



***Timarchoptera* figures 1–8:** 1–3 – *Chrysolina haemochlora*: 1 – total dorsal view, 2–3 – male (Siberia: Altai): 2 – aedeagus, dorsal and lateral view, 3 – maxillary palpus; 4 – *Chrysolina* sp. 8, male (Russian Far East: Khabarovsk Krai), aedeagus, dorsal and lateral view; 5–7 – *Ch. soiota soiota*: 5 – male (Siberia: Krasnoyarsk Krai), left elytron, dorsal view, 6 – pronotum, 7 – male (Krasnoyarsk Krai), aedeagus, dorsal view; 8 – *Ch. lomakini*, male, holotype (Siberia: W Sayan), aedeagus, lateral and dorsal view. (After: Jacobson, 1909: 1; Mikhailov, 2002a: 8; figs. by an unknown author: 6; others – figs. by the author)

Subgenus *Upseleatlasia* Bourdonné, 2012

Diagnosis

Body elongate oval or rounded-oval, moderately or very shining, slightly more shining in male than in female, very finely reticulated, brownish bronze, brassy bronze or greenish bronze, with elytral lateral sides and epipleura rufous or brick red, sometimes with elytra brownish rufous, marginated with pale stripe. Antennae entirely rufous or with only bases rufous. Legs brownish rufous, with tarsi and apices of tibiae rufous.

Maxillary palpi narrow, with last palpomere oval, hardly broadened, truncate apically.

Antennae narrow, with antennomeres 7–10 hardly broadened, longer than wide, antennomere 11 longer than 10. Antennal insertion closer to clypeus than to eye.

Pronotum slightly convex, about as wide as 2.5–3 X long, with lateral sides rounded, broadest basally or slightly before base. Lateral calli moderately convex or very convex. Lateral furrow developed in basal ⅓, short, narrow, deep; lateral impression shallow before mid-length, slightly deepened anteriorly and covered by several large punctures, or lateral impression absent in anterior ⅔ and replaced there by sparse punctures. Pronotal disc covered by very fine, sparse punctures. Anterior side of pronotum marginated and ciliate.

Prothoracic hypomeron slightly convex, with lateral impression shallow, smooth. Prosternum with narrow longitudinal furrow.

Elytra with 9 paired regular rows (interior rows sometimes irregular) of fine sparse or dense punctures, which distinct up to apex. Intervals of puncture rows impunctate or covered by very fine sparse punctures. Humeral calli hardly convex.

Elytral epipleura ciliate apically.

Hind wing absent.

Last abdominal sternite evenly convex in male.

Pygidium with longitudinal furrow.

In male all tarsomeres 1–3 very broad, slightly broader than apex of the respective tibiae, with entire sole. Tarsomeres 1–3 broader in male than in female. Claw tarsomere without denticles.

Aedeagus tube-shaped, curved dorso-ventrally, with apex curved ventrally and rounded at apical margin. Flagellum not exposed.

Differential diagnosis

The subgenus *Upseleatlasia* includes two species from High Atlas, Morocco. According to the original description (Bourdonné, 2012), the present subgenus is close to the subgenera *Chalcoidea* and *Hypochalcoidea* and differs in aedeagus evenly arc-shaped in apical part in lateral view,

without subapical lateral impression (difference from *Hypochalcoidea*) and in male antennae shorter than in *Chalcoidea*.

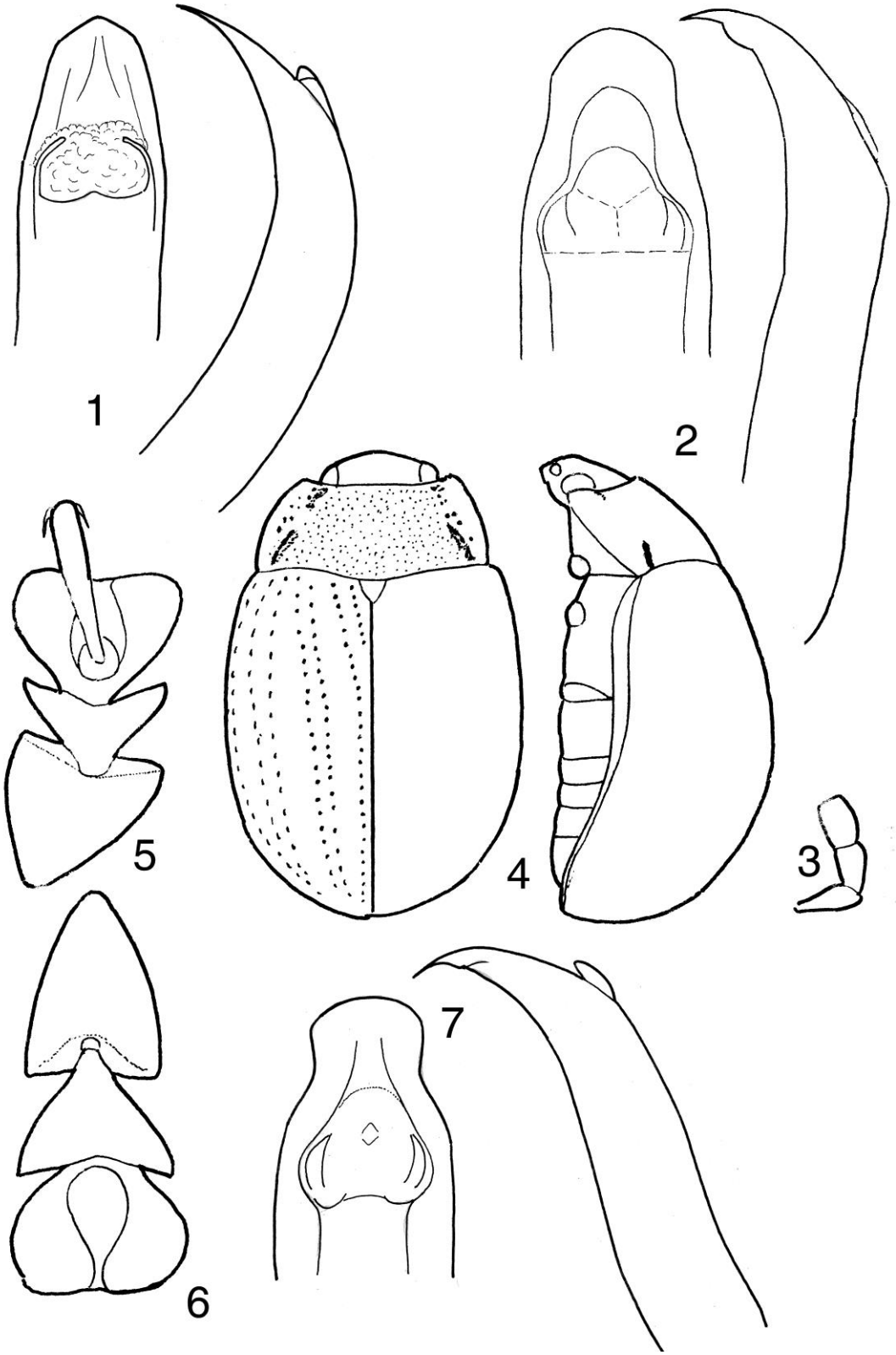
Key to species

1(2) Pronotum broadest before base and very slightly narrowed towards base. Elytral puncture rows almost equidistant. Aedeagus evenly narrowed to end or hardly stretched laterally before end, evenly curved near mid-length in lateral view, with apex less curved ventrally. Length 6.5–8.0 mm. Fig. 1. Morocco.

Ch. furva (Peyerimhoff, 1926)

2(1) Pronotum broadest basally. Elytral puncture rows 2–3, 4–5 slightly or distinctly paired. Aedeagus stretched laterally before end, almost straight near mid-length in lateral view, with apex more curved ventrally. Length 7.0–8.0 mm. Figs. 2–7. Species includes two subspecies. Morocco.

Ch. villiersi (Peyerimhoff, 1939)



***Upseleatlasia* figures:** 1 – *Chrysolina furva*, male, aedeagus, dorsal and lateral view; 2–6 – *Ch. villiersi ruficornis*, male, syntype (Morocco: Atlas): 2 – aedeagus, dorsal and lateral view, 3 – maxillary palpus, 4 – total view, 5 – fore-tarsus, 6 – hind-tarsus; 7 – *Ch. villiersi villiersi*, male (Morocco: G. Atlas), aedeagus, dorsal and lateral view. (Orig.)

Subgenus *Vittatochrysa* Lopatin, 1977

Diagnosis

Body rufous with black: stripe at pronotal base, scutellum, narrow sutural and broad discal longitudinal stripe on each elytron (Fig. 3), and underside except lateral sides of prothoracic epipleura and posterior part of the last abdominal sternite. Body length 5.3–7.1 mm.

Last maxillary palpomere similar in both sexes. It is oval, obliquely truncate at apex, similar to penultimate one in length and width (Fig. 2).

Antenna inserted closer to clypeus than to eye, narrow.

Pronotum broadest basally, swollen laterally along entire length, with lateral impression very shallow or absent. Anterior side of pronotum marginated and ciliate. Anterior setiferous pore absent.

Prothoracic hypomeron almost flat, laterally without distinct wrinkles and impression. Basal fold weak. Intercoxal prosternal process medially impressed in apical ½.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus. Elytral puncturation double (large and fine punctures), dense, mostly irregular. Large punctures partly forming abbreviated rows near suture and laterally.

Elytral epipleura inclined outside, visible along entire length in lateral view, ciliate near apex.

Hind wings absent.

Tarsomeres 1–3 with entire sole, moderately broadened in male, narrow in female. Claw tarsomere without denticles beneath.

Pygidium with weak impression in basal ⅓.

Last abdominal sternite with apical margin rounded, mostly evenly convex in both sexes.

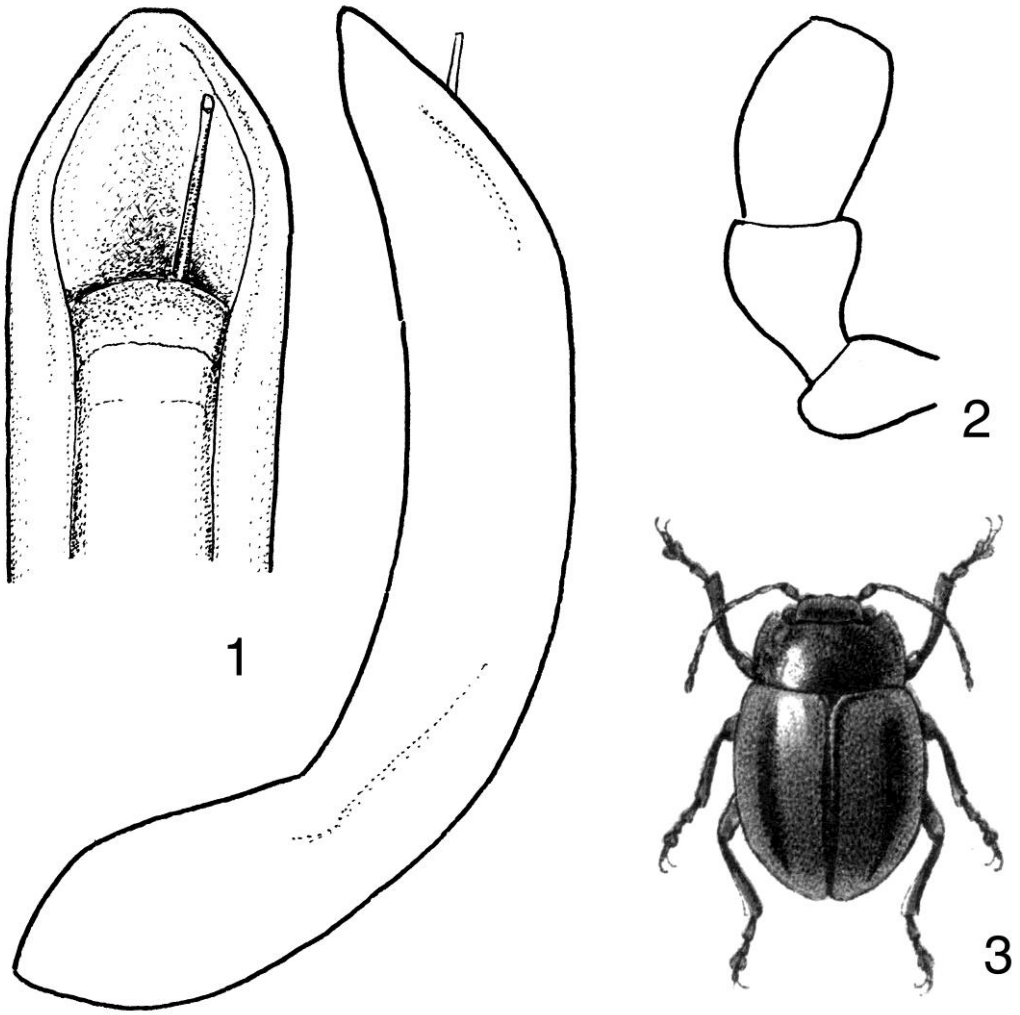
Aedeagus (Fig. 1) curved dorso-ventrally, tube-shaped, without apical denticles, with apex triangular. Flagellum narrow, simple, exposed.

Differential diagnosis

Vittatochrysa has an unique feature that distinguishes it from all known subgenera of *Chrysolina*. It is a coloration of dorsal side: rufous with black stripe at pronotal base and narrow sutural and broad discal longitudinal stripe on each elytron. Only one taxon, *Ch. bruneli*, presently considered to be a synonym of *Ch. sellata*, has similar coloration.

Not taking a color into account, *Vittatochrysa* is morphologically similar (including a structure of male aedeagus!) with the subgenus *Lopatinica*. There are no characters of subgeneral level to distinguish Central Asian subgenus *Vittatochrysa* from Caucasian-Turkish subgenus *Lopatinica*.

Vittatochrysa includes the single species, *Ch. nigrovittata* (Ballion, 1878) occurring in S-E Kazakhstan, Kyrgyzstan, and N-W China.



***Vittatochrysa* figures:** 1–3 – *Chrysolina nigrovittata*: 1–2 – male (Kyrgyzstan): 1 – aedeagus, dorsal and lateral view, 2 – maxillary palpus; 3 – total dorsal view. (After: Jacobson, 1909: 3; others – orig.)

Subgenus *Zeugotaenia* Motschulsky, 1860a

Diagnosis

Body dark metallic (bronze, greenish, blue or violet) or black, with elytra marginated with red stripe basally and laterally or only laterally.

Antennal insertion closer to clypeus than to eye. Antennae narrow, with antennomeres 7–11 slightly broadened. Orbital lines not reaching antennal insertions.

Last maxillary palpomere broad, broader than penultimate one in both sexes.

Pronotum broadest basally or at mid-length, with convex lateral calli along entire length, with narrow, deep lateral furrows in basal ⅓–½, and with shallow impression covered by large punctures anteriorly. Anterior side marginated and ciliate. Anterior setiferous pore absent.

Prothoracic hypomeron convex, with lateral impression filled with irregular wrinkles, with vertical outer edge. Basal fold strong.

Metasternum entirely marginated anteriorly.

Elytra with weak humeral callus. Elytral punctures fine or moderately large, irregular or partly arranged in rows which can be traced mostly near base and in interior ½. Intervals between punctures covered by very fine punctules.

Elytral epipleura inclined outside, visible along entire length in lateral view, ciliate near apex.

Hind wings: 1) normally developed, broad, longer than elytra, or 2) wings reduced, narrow, reaching only apex of abdomen, or 3) wings reduced, narrow, reaching the base of pygidium.

Pygidium with sharp furrow along entire length.

Last abdominal sternite evenly convex in both sexes, with apical margin broadly truncate in male, rounded in female.

Tarsomeres 1–3 with entire sole in both sexes; they are moderately or slightly broadened in male, narrow in female. Claw tarsomere without denticles beneath.

Aedeagus tube-shaped, with apical margin evenly rounded or moderately drawn out, without apical denticles. Flagellum narrow, simple, slightly exposed.

Differential diagnosis

Zeugotaenia is morphologically close to *Stichoptera* and differs in elytral punctures smaller, invisible without magnification, and in elytral red lateral stripe projecting along elytral base and reaching scutellum in *Ch.* (*Zeugotaenia*) *limbata* and *Ch.* (*Zeugotaenia*) *jenisseiensis*. *Ch.* (*Zeugotaenia*) *jacobyi*, in which elytral lateral stripe not projecting along base, differs from *Stichoptera* in aedeagus parallel-sided, without apical denticles at ventral side.

Key to species and subspecies

1(4) Elytra moderately shining or dull, marginated with red stripe basally and laterally. Male tarsomeres 1–3 moderately broadened.

2(3) Aedeagus evenly curved at apex in lateral view. Hind wings normally developed, broad, longer than elytra, or reduced, narrow, reaching only apex of abdomen.

Ch. limbata (Fabricius, 1775)

There are six subspecies.

(a) subsp. *limbata*. Europa, Russian Caucasus, N Kazakhstan, south of W Siberia. Elytral basal stripe as wide as about 0.16 X elytral length. Average ratio: width of basal stripe / width of lateral stripe = 0.8. Among the specimens with metallic coloration, most ones are bronze or green. Apex of aedeagus mostly short or moderately long. Proportion of individuals with black elytra without metallic tint is less than 25 %. 20 % of females and 10 % of males have normally developed hind wings. Figs. 1, 2, 4, 7, 9, 10, 12, 18–20.

(b) subsp. *discipennis* (Ménétriés, 1848). S-E European Russia, W Kazakhstan. Elytral basal stripe as wide as about 0.32 X elytral length. Average ratio: width of basal stripe / width of lateral stripe = 1. Among the specimens with metallic coloration, ⅔ ones are violet. Apex of aedeagus mostly short or very short. Males with long or very long aedeagus apex are absolutely absent. Proportion of individuals with black elytra without metallic tint is 10–20 %. Most specimens have normally developed hind wings. Fig. 11.

(c) subsp. *hochhuthii* (Suffrian, 1851). E Siberia, E Kazakhstan, Mongolia, N China. Elytral basal stripe as wide as about 0.27 X elytral length. Average ratio: width of basal stripe / width of lateral stripe = 1. Specimens with metallic coloration are mostly blue. 56 % of males have apex of aedeagus long or very long. Proportion of individuals with black elytra without metallic tint is 24 %. 20 % of females and 4 % of males have normally developed hind wings. Fig. 3, 8.

(d) subsp. *luigionii* (Depoli, 1936). Apennines, Alps, Herzegovina, Mediterranean Sea shore of France. Elytral basal stripe as wide as about 0.16 X elytral length. Average ratio: width of basal stripe / width of lateral stripe = 0.7. 75 % of males have apex of aedeagus long or very long. Most individuals have black elytra without metallic tint. All females and males have reduced hind wings. Fig. 5.

(e) subsp. *russiella* Bieńkowski et Orlova-Bienkowskaja, 2011b. Middle belt of European Russia, Ukraine. Elytral basal stripe as wide as about 0.10 X elytral length. Average ratio: width of basal stripe / width of lateral stripe = 0.7. All specimens with metallic coloration are bronze. Black specimens are rare. Apex of aedeagus mostly short or very short. More than 50 % of females and 33 % of males have normally developed hind wings. Figs. 13, 14.

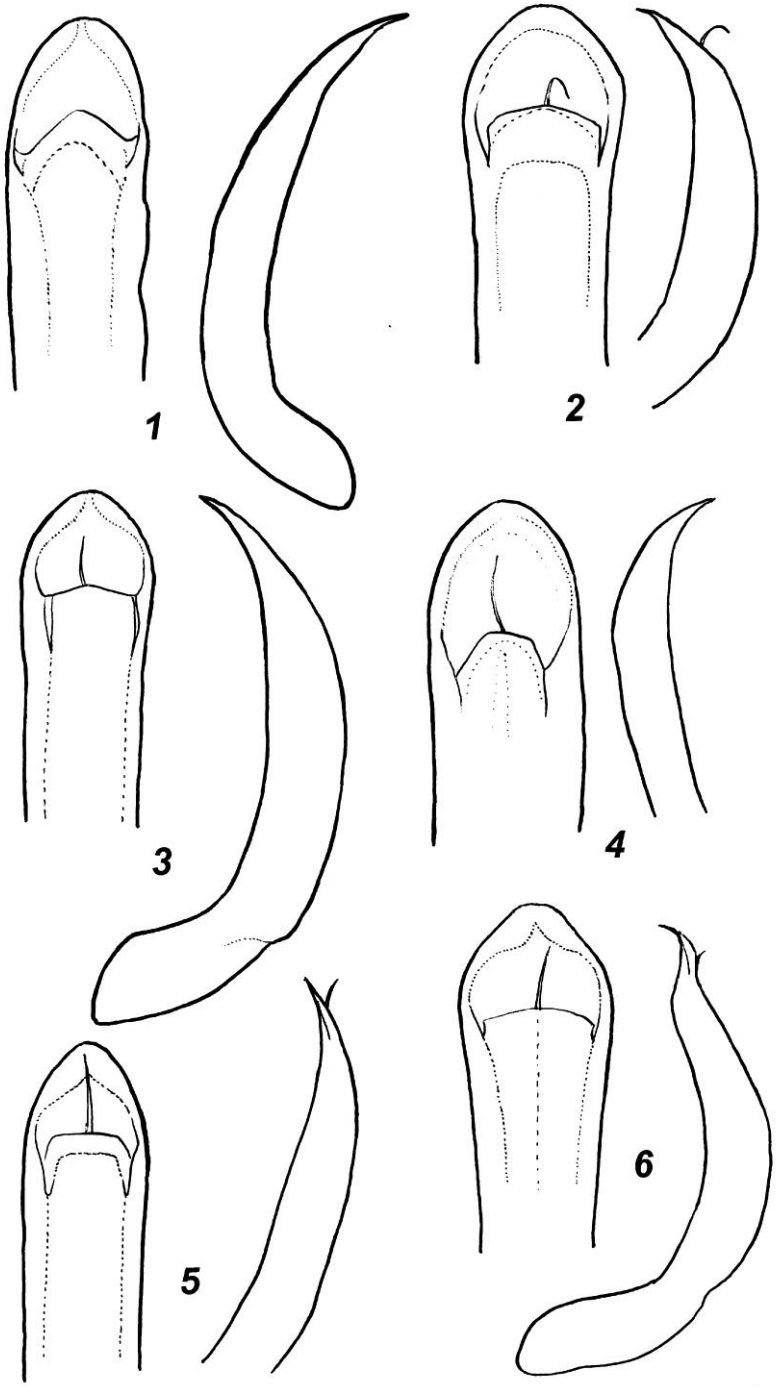
(f) subsp. *volodi* Bieńkowski et Orlova-Bienkowskaja, 2011b. Malyi Caucasus, E Turkey. Elytral basal stripe as wide as about 0.20 X elytral length. Average ratio: width of basal stripe / width of lateral stripe = 0.9. Specimens with metallic coloration are mostly blue; bronze and violet ones are absent. 90 % of males have apex of aedeagus long or very long. Proportion of individuals with black elytra without metallic tint is less than 25 %. All females and males have reduced hind wings. Figs. 15, 16.

3(2) Aedeagus S-shaped at apex in lateral view. Hind wings reduced, narrow, reaching only apex of abdomen. Body blackish blue. Elytra with broad stripe basally and laterally. Length 4.8–8.7 mm. Fig. 6. Caucasus, E Siberia, Yakutia, Mongolia.

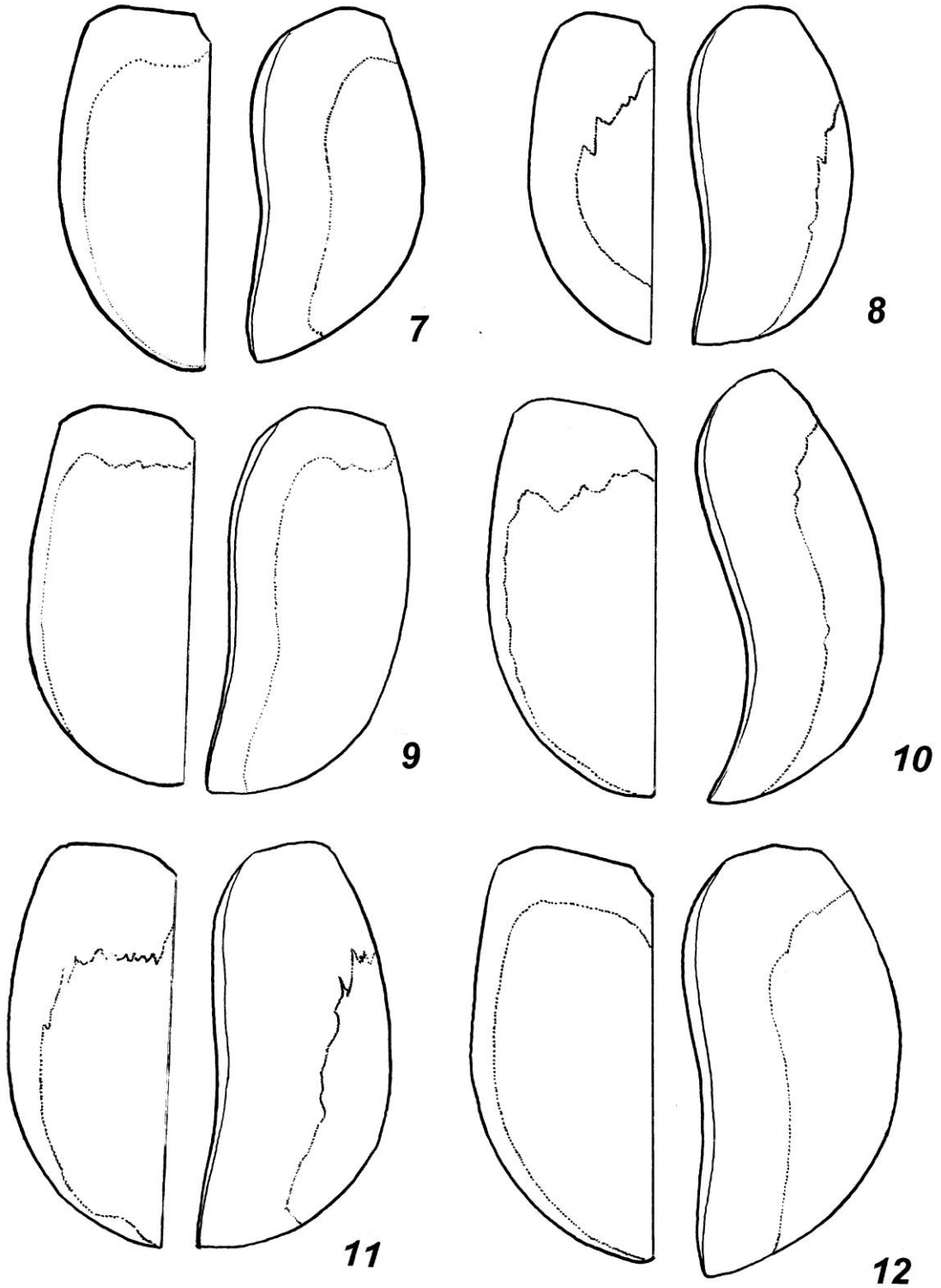
Ch. jenisseiensis (Breit, 1920)

4(1) Elytra black, lacquer-shiny, marginated with red stripe only laterally. Male tarsomeres 1–3 slightly broadened. Aedeagus evenly curved at apex in lateral view. Hind wings reduced, narrow, reaching only base of pygidium. Length 6.8–7.3 mm. Fig. 17. E China, Russian Far East.

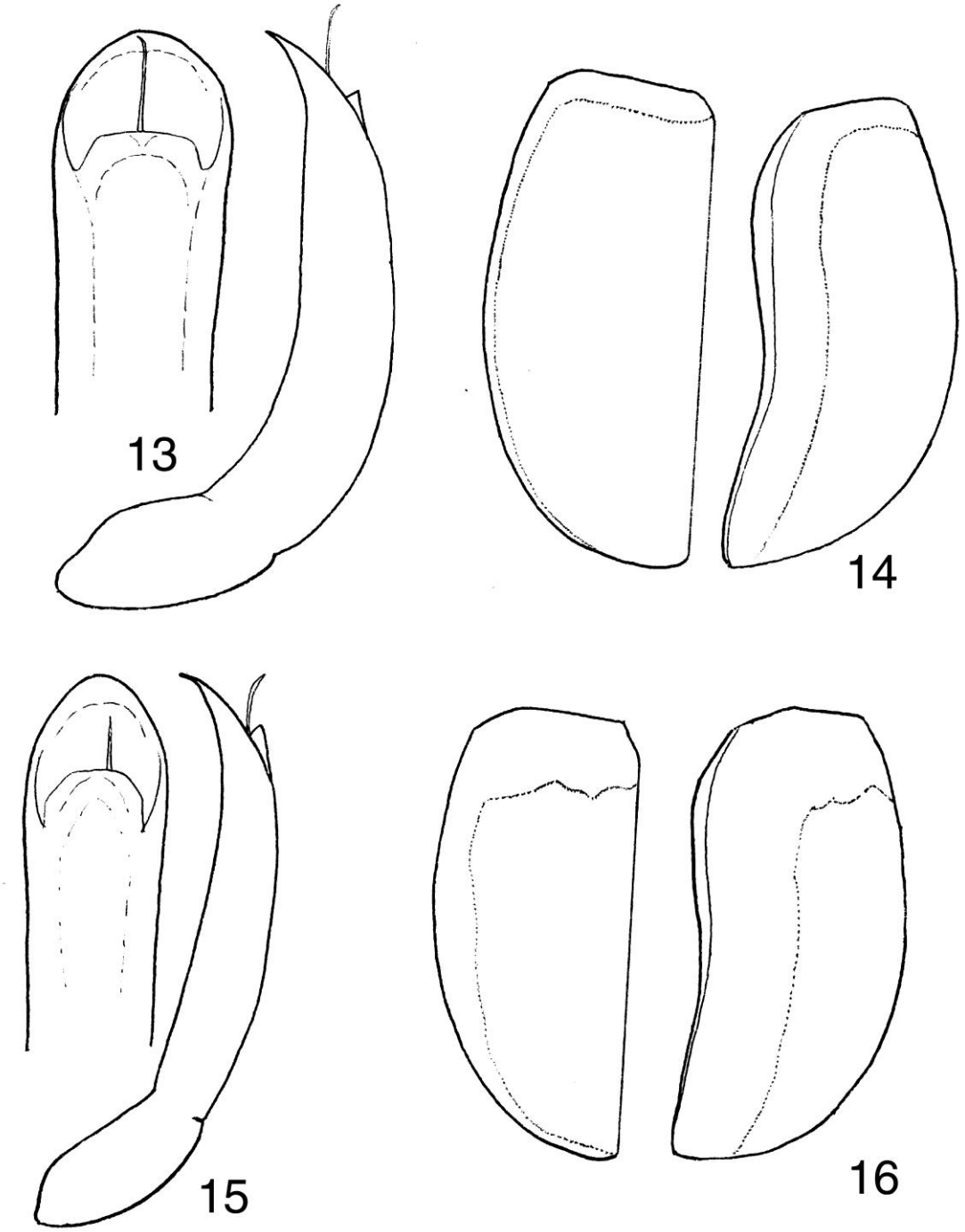
Ch. jacobyi (Baly, 1878b)



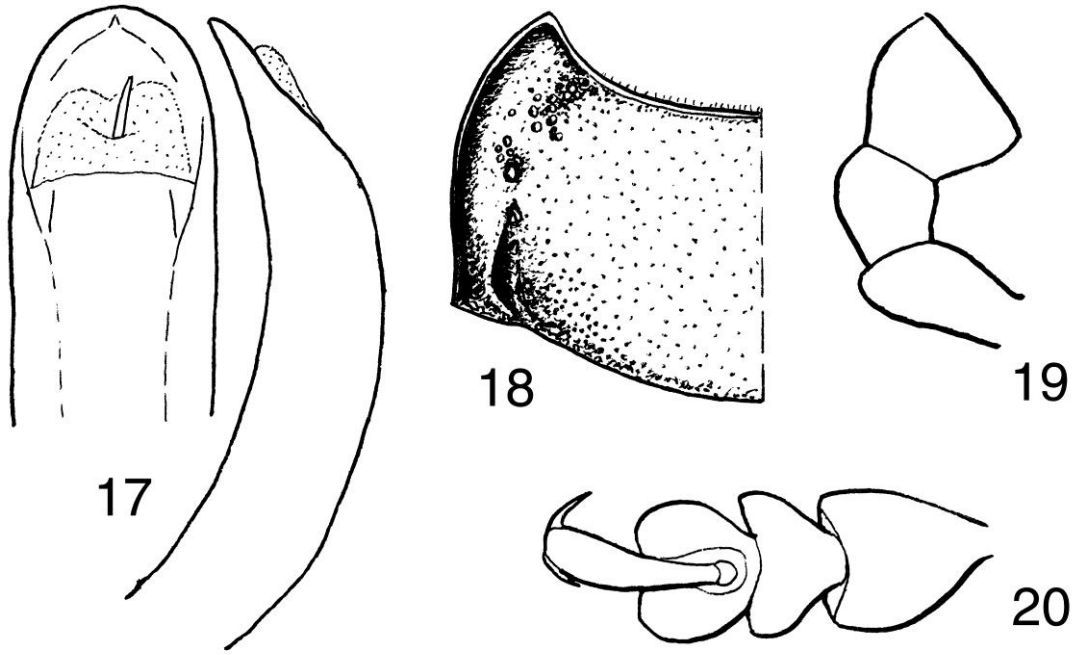
***Zeugotaenia* figures 1–6:** Male aedeagus, dorsal and lateral view: 1 – *Chrysolina limbata limbata*, neotype (Great Britain), 2 – *Ch. limbata limbata* (neotype *Ch. limbifera*, Caucasus), 3 – *Ch. limbata hochhuthii*, lectotype (Baikal), 4 – *Ch. limbata limbata* (syntype *Ch. limbata kavani*, Slovakia), 5 – *Ch. limbata luigionii*, topotype (Italy: Abruzzen), 6 – *Ch. jenisseiensis*, topotype (Siberia: Krasnoyarsk). (Orig.)



***Zeugotaenia* figures 7–12:** Left elytron, dorsal and lateral view: 7 – *Chrysolina limbata limbata*, neotype, male (Great Britain), 8 – *Ch. limbata hochhuthii*, lectotype, male (Baikal), 9 – *Ch. limbata limbata*, male (neotype *Ch. limbifera*, Caucasus), 10 – *Ch. limbata limbata*, male (syntype *Ch. limbata kavani*, Slovakia), 11 – *Ch. limbata discipennis*, lectotype, female (W Kazakhstan), 12 – *Ch. limbata limbata*, female (lectotype *Ch. findelii*, Krain). (Orig.)



Zeugotaenia **figures 13–16:** 13–14 – *Chrysolina limbata russiella*, male, holotype (European Russia: Saratov reg.): 13 – aedeagus, dorsal and lateral view, 14 – left elytron, dorsal and lateral view; 15–16 – *Ch. limbata volodi*, male, holotype (Armenia): 15 – aedeagus, dorsal and lateral view, 16 – left elytron, dorsal and lateral view. (Orig.)



***Zeugotaenia* figures 17–20:** 17 – *Chrysolina jacobyi*, male, aedeagus dorsal and lateral view; 18–20 – *Ch. limbata limbata*, neotype, male (Great Britain): 18 – pronotum, 19 – maxillary palpus, 20 – fore-tarsus. (Orig.)

Unnamed species groups of subgeneric rank
(ordered alphabetically based on the names of species groups)

Ch. (*ambigua*) species group from N India and Nepal

Diagnosis

Body metallic golden green with purple pattern, including large spot on head, most part of pronotum, and three longitudinal stripes on each elytron, shining, with pronotum sericeous; very convex, with constriction laterally between pronotum and elytra.

Last maxillary palpomere narrow, elongate, almost cylindrical, similar to penultimate palpomere in length and width. Ocular groove developed above eye and along its inner border, but not reaching antennal base. Antennae narrow, with apical segments elongate.

Pronotum with anterior and posterior setiferous pores; anteriorly marginated and ciliate. Lateral callus moderately convex, not separated from disc; pronotum covered by dense, fine punctures.

Prothoracic hypomeron convex, with strong basal fold; laterally without impression and wrinkles. Prosternal process convex, broadened and bifurcate apically. Antero-lateral portions of prosternum broad, weakly convex, marginated anteriorly and bearing deep furrow posteriorly.

Metasternum anteriorly with broad convex callus separated by deep impression.

Elytra with obsolete humeral callus, with broad weak transverse impression behind humeral callus in lateral ⅓. Small punctures forming abbreviated scutellar row and 9 slightly paired rows; rows regular. Intervals between rows are flat, covered by sparse microscopical punctules and weak wrinkles. Sutural stria fine but distinct at apical slope.

Elytral epipleura inclined outside along entire length, well visible in lateral view, with sparse setae near apex.

Hind wings absent.

Pygidium with broad furrow along entire length.

Last abdominal sternite simple, convex and moderately swollen, rounded apically.

Tarsomeres 1–3 with entire sole, narrow. Claw tarsomere with 2 fine denticles beneath.

Length (mm): 8.5 (female, after Chen, 1936c), 8.1 (available female). Male is unknown.

Differential diagnosis

The single species of this group, *Ch. ambigua* (Chen, 1936c), looks like the members of the genus *Parambrostoma* because of metallic green coloration with purple pattern. It differs from Chinese members of *Chrysolina* (*zhongdiana*) species group, having similar coloration, in strong prothoracic basal fold and distinct furrow on pygidium. *Ch. ambigua* occurs in N India and Nepal.

Ch. (*dhaulagirica*) species group from Nepal

Diagnosis

Body convex, obovate or oval, slightly constricted laterally between pronotum and elytra; above obsoletely or distinctly shagreen, besides that, head and pronotum microscopically punctulate; shining (!) (in the original description of *Ch. hartmanni*: "mostly dull"). Body including antennae, underside, and legs, dark metallic, with pale brown or rufous antennomeres 1 or 1–2 ventrally, and rufous elytral lateral stripe occupying 2 lateral intervals and projecting basally till scutellum.

Last maxillary palpomere narrow, oval, beveled, in female 1.5–1.6 X longer than broad, 1.2–1.3 X longer than penultimate palpomere and 1.0–1.1 X broader than latter; in male 1.2–1.5 X longer than broad, 1.0–1.3 X longer than penultimate one, as broad as the latter; in male hardly broader than in female. Antenna inserted 1.3–1.8 X closer to clypeus than to eye. Antennomeres 6–11 weakly broadened, in male slightly broader than in female. Orbital line broadly impressed above eye, not projecting along inner border or eye.

Pronotum transversely very convex or moderately convex, broadest basally or at mid-length. Anterior angles weakly or moderately produced. Anterior side of pronotum entirely marginated, with setae. Anterior setiferous pore absent. Pronotum laterally weakly to moderately swollen along entire length, therefore lateral calli weakly to moderately convex. Pronotal lateral impression narrow, shallow, furrow-shaped in basal ¼; they are broad, very shallow (but distinct!), covered by several large punctures in anterior ¾. Punctures at pronotal disc numerous, but sparse, very fine.

Prothoracic hypomeron slightly convex, very weakly impressed along outside or without impression, without wrinkles. Basal fold absent. Intercoxal prosternal process with shallow longitudinal impression filled by wrinkles. Antero-lateral portions of prosternum flat, anteriorly marginated, with wide impression posteriorly.

Metasternum entirely marginated anteriorly.

Elytron without humeral callus or with very weak callus; with 10 regular rows (including abbreviated scutellar row which consists of 2–11 punctures) of fine to moderate punctures. Rows placed at equal distances from each other, or only rows 5 and 6 slightly paired, or rows 2–3, 4–5, 6–7, and 8–9 paired. Intervals flat, covered by sparse, obsolete wrinkles and sparse, very fine punctures.

Elytral epipleura inclined outside, visible along entire length in lateral view, sparsely (or very sparsely) ciliate near apex.

Hind wings very reduced, narrow, as long as metathorax.

Tarsomeres 1–3 with entire sole; tarsomere 1 of all tarsi strongly or moderately dilated in male; tarsomeres 1–3 narrow in female. Claw tarsomere with 2 very fine denticles beneath at apical margin.

Pygidium with weak or obsolete impression along entire length or in basal ½ only.

Last abdominal sternite: male: convex, truncate or broadly and shallowly emarginated apically, female: convex, marginated and broadly truncate apically.

Aedeagus tube-shaped, rounded apically, moderately curved dorso-ventrally, with flagellum simple, narrow, exposed.

Differential diagnosis

This group of species well differs from all other S Asian *Chrysolina* species by the regular puncture rows on elytra, narrow lateral impression at pronotal base, rufous lateral band on elytra. They look like the members of *Zeugotaenia*, but differ in last maxillary palpomere narrow, elytral punctures arranged in more regular rows, pygidium without strong furrow. They look like *Taeniosticha* members, especially apterous ones, but differ by pygidium without furrow, and elytral intervals flat. They also look like *Ch. dohrni* and *Ch. taygetana* and differ from the former in pygidium without furrow, and from the latter in different aedeagus structure.

Key to species and subspecies

1(2) Pronotum broadest at mid-length or before base. Prothoracic hypomeron without basal fold. Elytron without a trace of humeral callus. Elytral rows distinctly paired. Male tarsomeres 1 moderately to strongly dilated.

Body including antennae, underside, legs, dark bronze, with antennomeres 1 and 2 ventrally rufous, pronotal lateral calli reddish brown, elytral lateral stripe occupying 2 lateral intervals and projecting basally till scutellum rufous. Basal elytral stripe narrower than lateral one. Sometimes 1st elytral interval (innermost) also rufous. Length 7.1–8.0 mm. Figs. 1–10. Nepal.

Ch. hartmanni L.Medvedev, 1999b

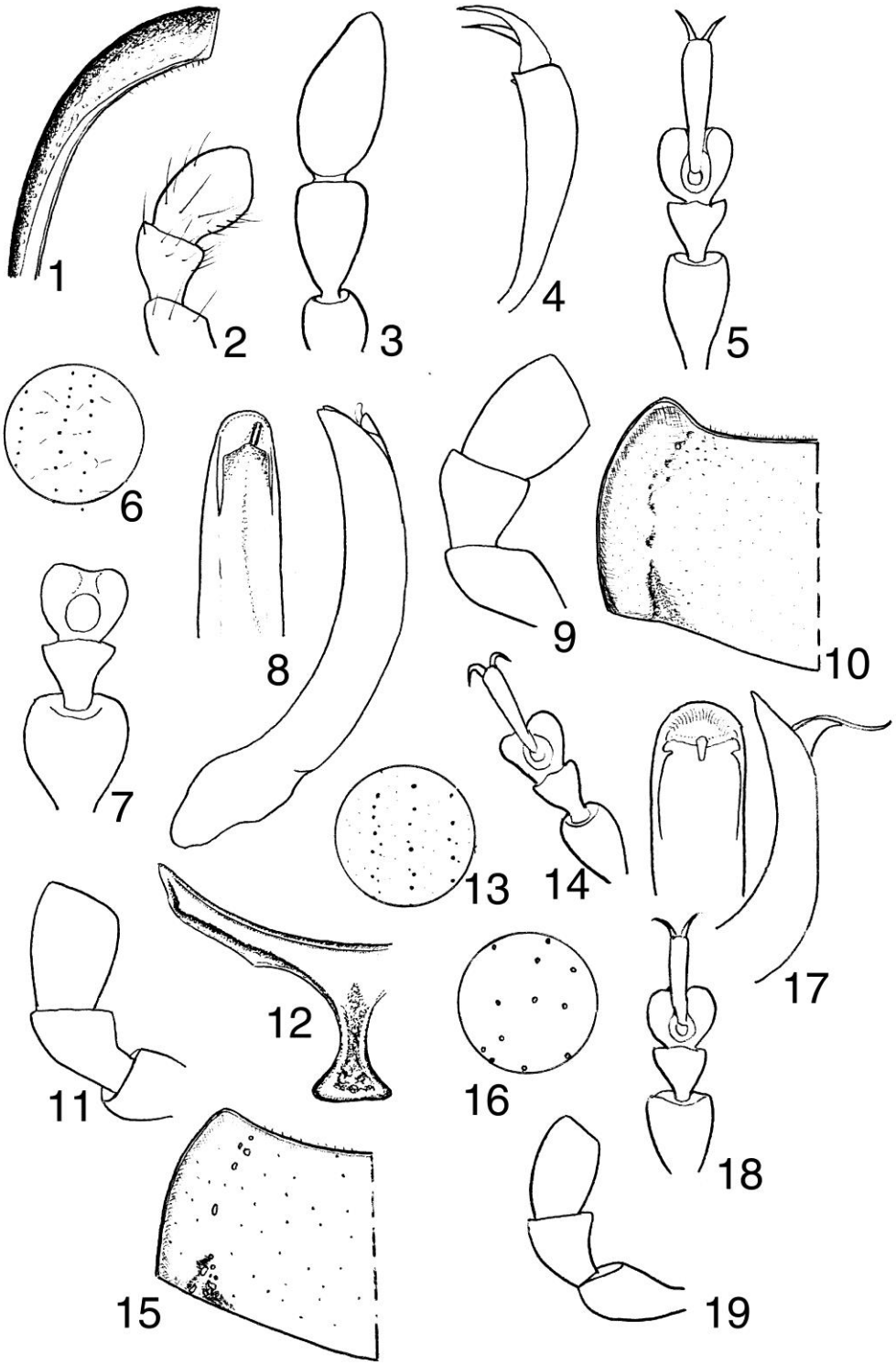
2(1) Pronotum broadest basally. Prothoracic hypomeron with weak basal fold. Elytron with very weak humeral callus. Elytral rows placed at equal distance from each other or only rows 5–6 slightly paired. Male tarsomeres 1 moderately dilated.

3(4) Elytral punctures arranged in dense rows. Pronotal anterior angles more produced than in the following taxon. Body including legs and underside bluish black or dark bronze, antennae black with antennomere 1 rufous below apically, elytral lateral stripe occupying 2 lateral intervals, and basal stripe (as wide as lateral stripe) rufous. Length: 5.8 mm (male), 6.0–6.5 mm (female). Figs. 11–14, 20, 21. Nepal.

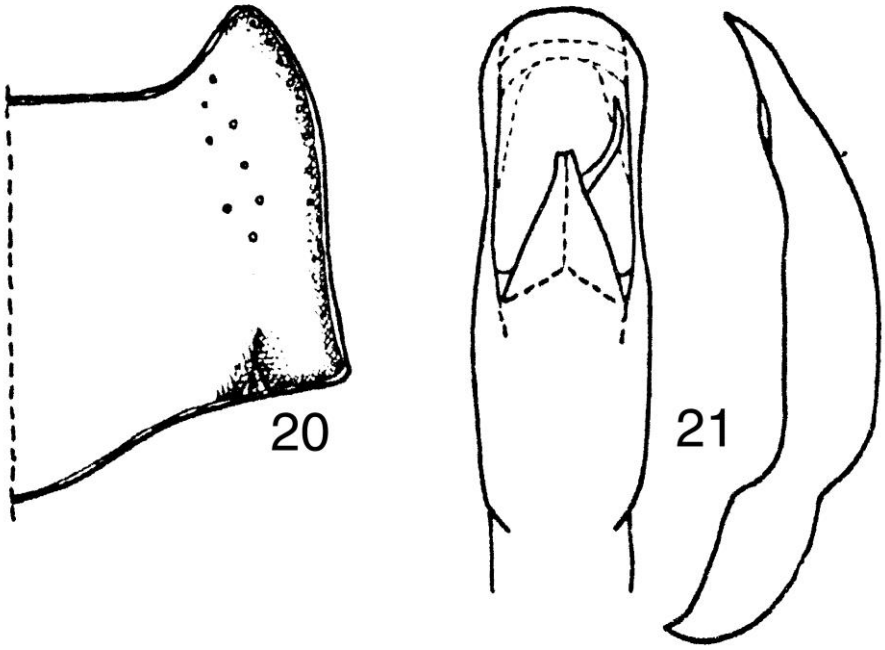
Ch. dhaulagirica dhaulagirica L.Medvedev, 1990

4(3) Elytral punctures arranged in sparse rows. Pronotal anterior angles less produced than in the previous taxon. Dorsum black with strong golden or golden green reflection, underside, legs, and antennae with weak metallic reflection, antennomeres 1 and 2 ventrally, elytral lateral stripe occupying 2 lateral intervals, and narrower basal stripe rufous. Length: 5.2–6.0 mm (male), 6.0 mm (female). Figs. 15–19. Nepal.

Ch. dhaulagirica arunensis L.Medvedev, 1992b



***Ch.* (*dhaulagirica*) species group 1–19**: 1–10 – *Chrysolina hartmanni*: 1–6 – female, paratype (Nepal): 1 – apex of elytron underside, 2 – maxillary palpus, 3 – apex of antenna, 4 – 4th fore-tarsomere, 5 – fore-tarsus, 6 – 2–4th puncture rows at elytral basal ½; 7–10 – male, paratype (Nepal): 7 – fore-tarsus, 8 – aedeagus, 9 – maxillary palpus, 10 – pronotum; 11–14 – *Ch. dhaulagirica dhaulagirica*, female, paratype (Nepal): 11 – maxillary palpus, 12 – prosternum, 13 – 2–4th puncture rows at elytral basal ½, 14 – fore-tarsus; 15–19 – *Ch. dhaulagirica arunensis*, male, paratype (Nepal): 15 – pronotum, 16 – 2–4th puncture rows at elytral basal ½, 17 – aedeagus, 18 – fore-tarsus, 19 – maxillary palpus. (Orig.)



Ch. (***dhaulagirica***) **species group 20–21:** *Chrysolina dhaulagirica dhaulagirica*, male, holotype (Nepal): 20 – pronotum, 21 – aedeagus, dorsal and lateral view. (After: Medvedev, 1990: 20–21)

Ch. (*dohertyi*) species group

Diagnosis

Body (Fig. 1) elongate, convex. Body, including underside, antennae, and legs, bronze or brassy; sericeous shining, distinctly microreticulate. Antennomeres 1–3 rufous below, mostly at apex. Body length 5.8–7.7 mm.

Last maxillary palpomere oval, obliquely truncate at apex, similar to penultimate one in length and width, similar in male and female. Base of the antenna placed more close to clypeus than to eye.

Pronotum broadest near mid-length or basally, with lateral sides arc-shaped anteriorly and almost straight posteriorly, with lateral calli narrow, convex along entire length, with lateral impression broad, shallow along most length and more deepened basally or anteriorly and basally, covered by numerous, moderately large punctures, with disc covered by dense fine punctures. Anterior side of pronotum marginated, ciliate. Anterior setiferous pore of pronotum present.

Prothoracic hypomeron convex, with shallow impression and distinct irregular wrinkles laterally, with lateral border (at least, anteriorly). Basal fold of prothoracic hypomeron distinct.

Metasternum marginated anteriorly.

Elytron with weak humeral callus. Elytron covered by regular paired rows of dense, fine punctures. Intervals between puncture rows flat, covered by very fine dense punctures and fine obsolete wrinkles.

Elytral epipleuron inclined outside, visible along entire length in lateral view, ciliate near apex.

Hind wings reduced: narrow, reaching pygidium.

Tarsomeres 1–3 with entire sole in both sexes, narrow in female, with all tarsomeres 1 and 3 moderately broadened in male. Claw tarsomere without denticles beneath.

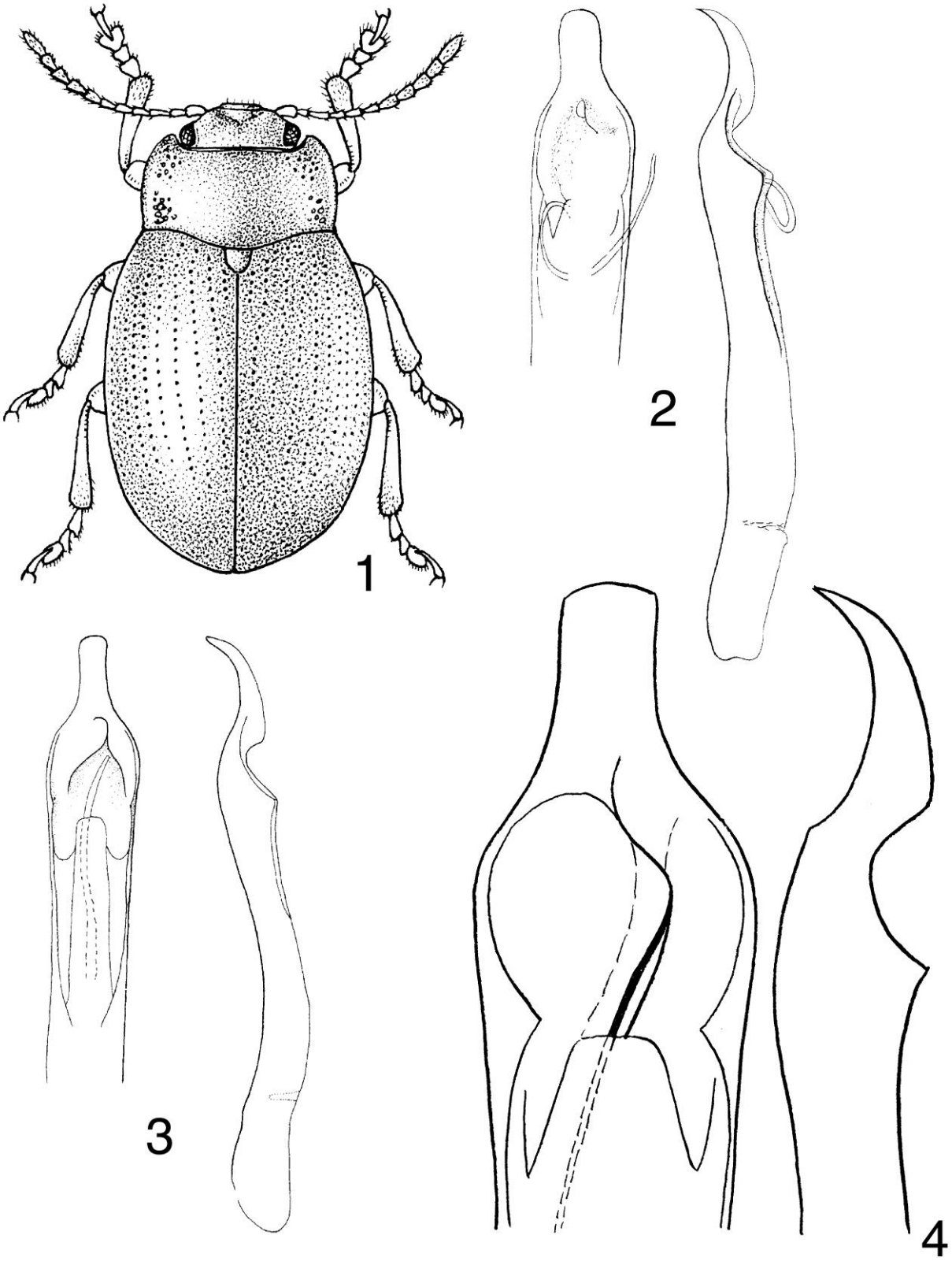
Pygidium with distinct furrow in basal ⅔ and convex, without any impression in apical ⅓.

Last abdominal sternite weakly depressed at middle, with bisinuate apical margin in male, convex and slightly turned down, with apical margin convex in female.

Aedeagus (Figs. 2–4) long, flat dorso-ventrally, with asymmetric groove on the bottom of apical orifice, with long apical projection. Flagellum simple, whip-shaped, exposed.

Differential diagnosis

Chrysolina (*dohertyi*) species group externally looks like the members of the subgenus *Chalcoidea* and differs in male aedeagus conspicuous. This group includes one species, *Ch. dohertyi* Maulik, 1926 occurring in Vietnam, China (Yunnan), Myanmar.



Ch. (***dohertyi***) **species group**: *Chrysolina dohertyi*: 1 – total dorsal view (holotype *Ch. jelineki*, Yunnan); 2–4 – aedeagus, dorsal and lateral view: 2 – male (holotype *Ch. jelineki*, Yunnan), 3 – male (syntype, Myanmar), 4 – male (Vietnam). (After: Ge, et al., 2009: 1–3; orig. fig.: 4)

Ch. (*fortunata*) species group from Canary Isls.

Diagnosis (based on the female, holotype of *Ch. fotrunata*)

Body convex, oval with parallel lateral sides. Above distinctly shagreen, weakly shining. Dorsum blackish brown, with weak bluish tint (visible in sun light), which looks like weak golden tint under filament lamp. Underside including elytral epipleura bright brown, with bronze reflection on metasternum and abdominal sternites. Antennae, labrum, palpi, and legs rufous. Length: 9.1 mm (female), male is unknown.

Clypeus with very fine, sparse punctures, vertex with sparse, slightly larger punctures. Clypeal and frontal sutures distinct. Last maxillary palpomere oval, truncate, narrow, 1.3 X longer than broad, 1.7 X longer than penultimate palpomere, 1.3 X broader than latter. Antenna inserted 2 X closer to clypeus than to eye, narrow, with antennomeres 8–11 project beyond pronotal base. Antennomere 10 1.9 X longer than broad. Orbital line distinct above eye and along interior border of eye and finishing far from antennal insertion.

Pronotum 2.5 X broader than long, 1.8 X broader between posterior angles than between anterior ones, convex, broadest basally, with lateral sides weakly arc-shaped, evenly and gradually attenuated from base to apex. Anterior angles acuter, than in *Ch. costalis*, moderately produced. Anterior side of pronotum marginated, with setae. Large anterior setiferous pore absent. Pronotum laterally weakly swollen along entire length. Pronotal lateral impressions broad and very shallow, slightly deeper basally, but not fold-shaped. Pronotal punctures more distinct, than in *Ch. costalis*, mostly fine, dense, slightly larger in lateral impressions.

Prothoracic hypomeron flat, laterally without distinct impression, with only hardly visible, obsolete wrinkles. Basal fold absent. Intercoxal prosternal process with deep medial impression along entire length. Anterolateral portions of prosternum weakly convex, marginated anteriorly and posteriorly.

Metasternum entirely marginated anteriorly.

Elytron with projected humeral angle and without humeral callus; with paired regular rows of sparse, fine punctures becoming further finer posteriorly. Rows hardly visible because of sparse, fine punctures in intervals. Scutellar row abbreviated, consists of 7–9 punctures. Intervals mostly flat, those between rows 2–3 and 4–5 very weakly raised (hardly convex). Sutural stria fine, but distinct at posterior ½ of apical slope.

Elytral epipleura inclined outside, visible along entire length in lateral view; sparsely ciliate near apex.

Hind wings broad, slightly reduced, reaching elytral apex.

Tarsomeres 1–3 narrow, with entire sole. Claw tarsomere without denticles beneath.

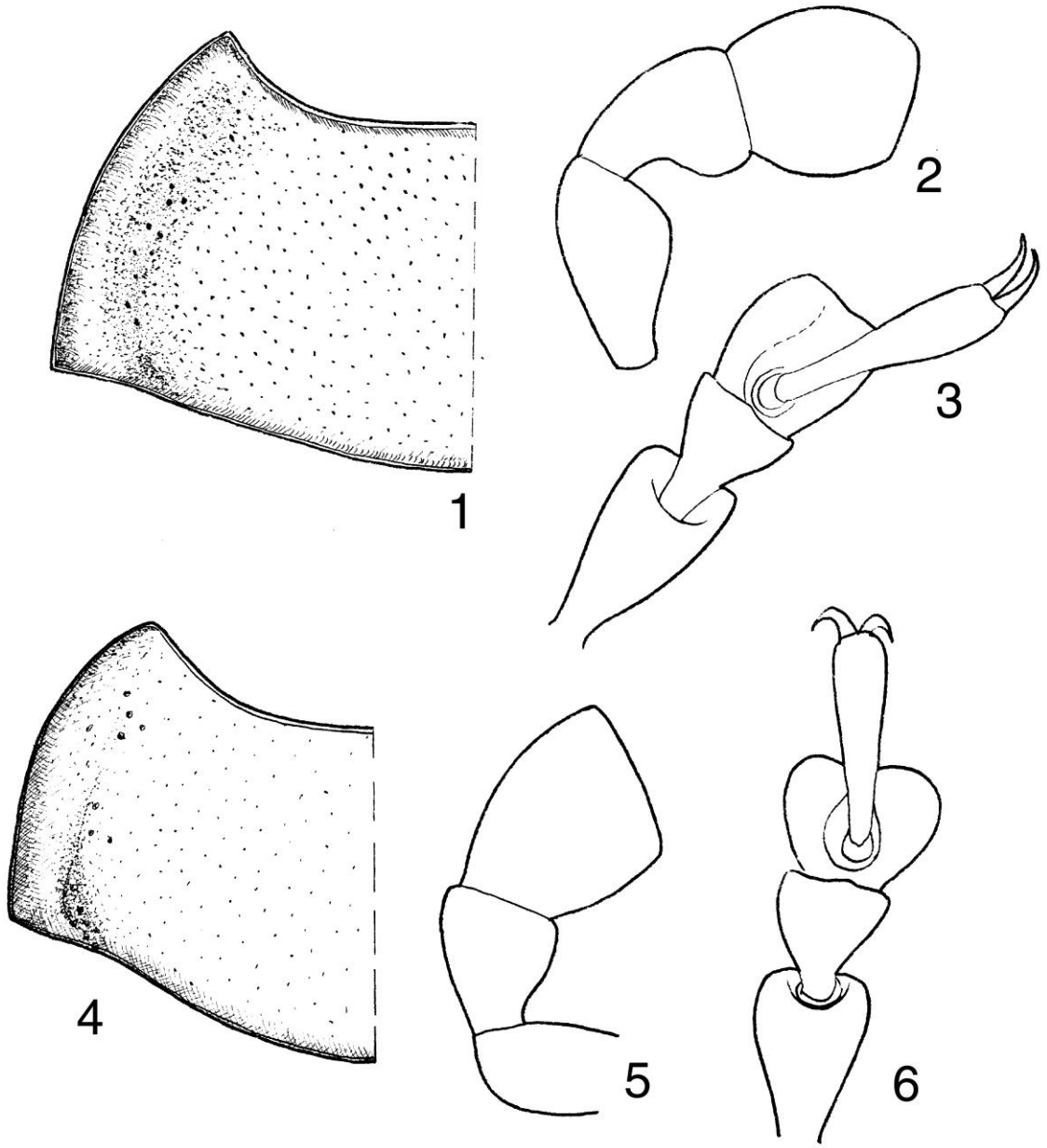
Pygidium with broad longitudinal impression along entire length.

Last abdominal sternite weakly convex, with apical margin broadly and very weakly emarginated.

Differential diagnosis

Ch. fortunata (Figs. 1–3) differs from *Ch. costalis* (Figs. 4–6) in pronotal shape (evenly and gradually attenuated from base to apex), anterior pronotal angles (acuter), bright rufous coloration of antennae and legs, pronotal lateral impression basally shallower and not fold-shaped, pronotum laterally more weakly swollen, prosternal basal fold absents, elytral epipleura well visible along entire length.

This group includes one species, *Ch. fortunata* (Wollaston, 1864) occurring in Canary Isls.



Chrysolina fortunata in comparison with *Ch. costalis*: 1–3 – *Ch. fortunata*, female, holotype (Canary Isls.): 1 – pronotum, 2 – maxillary palpus, 3 – fore-tarsus; 4–6 – *Ch. costalis*, male (Canary Isls.): 4 – pronotum, 5 – maxillary palpus, 6 – fore-tarsus. (Orig.)

Ch. (*kinabaluensis*) species group from Kalimantan

Diagnosis

Dorsum shining or moderately shining; head and pronotum very finely reticulated, elytra smooth. Head, pronotum, antennae, underside, and legs bright metallic: green or blue, with abdominal sternites 4 and 5 reddish; elytra red or purplish red; pygidium yellow with brown apical margin. Body length 8.5–9.7 mm.

Last maxillary palpomere narrow, cylindrical with apex obliquely truncate, slightly narrower and shorter than penultimate one, similar in both sexes. Base of the antenna closer to clypeus than to eye.

Pronotum broadest basally, with triangularly projecting anterior angles, with lateral sides convergent forward. Lateral sides almost straight in basal ½ and slightly arc-shaped in apical ½. Pronotal lateral calli convex along entire length. Lateral impressions broad, shallow, developed along entire length, slightly deepened basally, covered with numerous large punctures. The same punctures cover the inner ½ of lateral callus. Disc covered by mixed fine punctures: some larger and some smaller ones. Anterior side of pronotum marginated and ciliate. Anterior setiferous pore absent.

Prothoracic hypomeron convex, with weak, interrupted lateral border accompanied with fine, short transverse wrinkles. Basal fold of prothoracic hypomeron absent.

Metasternum entirely marginated anteriorly by convex callus.

Elytron with moderately convex humeral callus, separated interiorly by deepened basal part of 5th puncture row. Elytral punctures arranged in regular or partly undulate paired rows. Punctures in rows are dense, moderate to fine, they are smaller than those in pronotal impressions, but larger than those at pronotal disc, some larger basally than apically. Rows poorly visible because of fine dense punctures in intervals. Intervals flat.

Elytral epipleura inclined outside, visible along entire length in lateral view, ciliate in apical ½.

Hind wings developed.

Tarsomeres 1–3 with entire sole in both sexes, slightly broadened in male, narrow in female. Claw tarsomere with 2 very fine denticles on underside.

Pygidium with impression in basal ½, convex in apical ½.

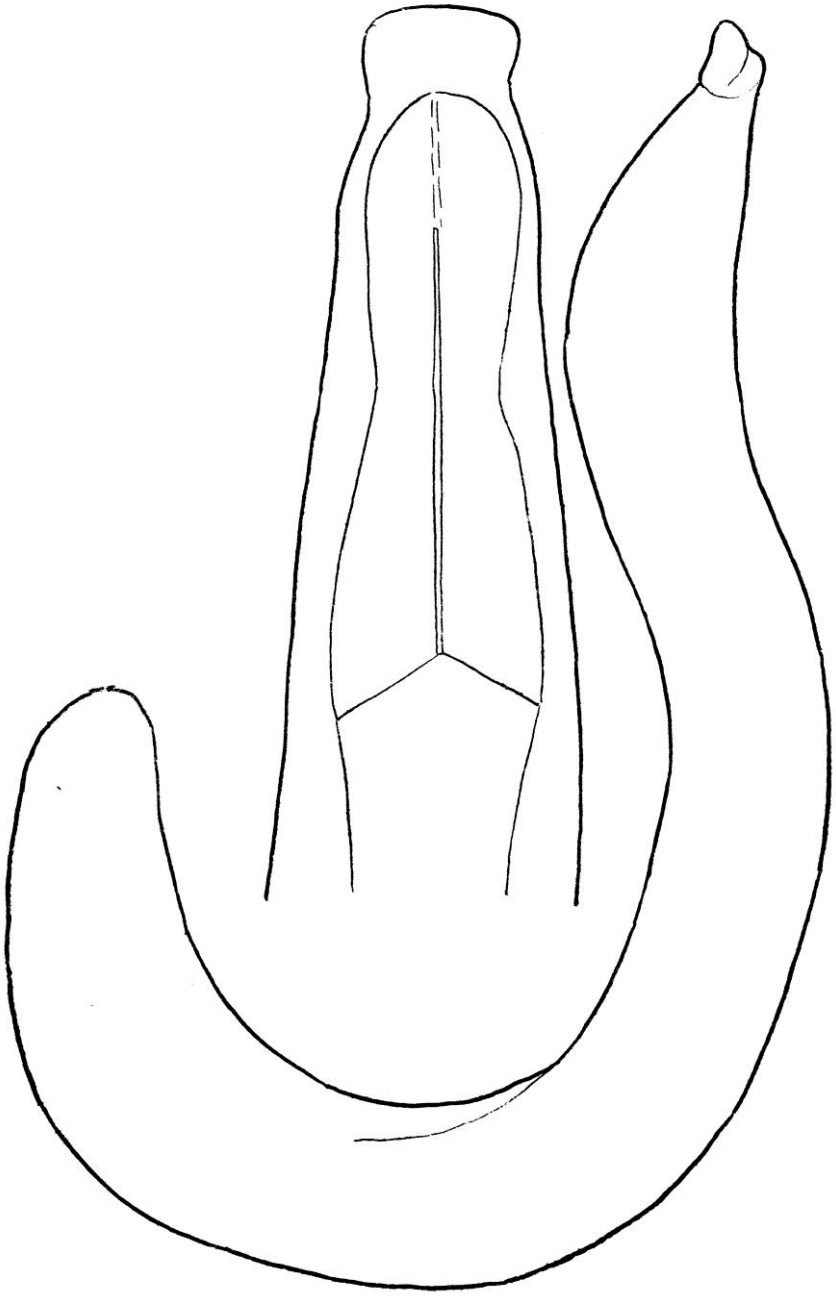
Last abdominal sternite less convex, broadly truncate apically in male, more convex, with apical margin rounded in female.

Aedeagus (Fig.) long, narrow, tube-shaped, conspicuously curved in the form of question mark. Flagellum long, narrow, whip-shaped, exposed.

Differential diagnosis

The single species of the present group looks like the members of the subgenus *Pierryvettia* and has a superficial resemblance to *Ch.* (*Pierryvettia*) *sumatrensis*, but differs in elytral epipleura oblique, pronotum with convex lateral calli separated by impressions along entire length, and conspicuous shape of aedeagus.

This group includes one species, *Ch. kinabaluensis* Bechyné, 1952a occurring in Kalimantan Isl.



Ch. **(*kinabaluensis*) species group:** *Chrysolina kinabaluensis*, male (Kalimantan), aedeagus, dorsal and lateral view. (Orig.)

Ch. (*nagaja*) species group

Diagnosis

Body very convex, oval, constricted at sides between pronotum and elytra. Above distinctly shagreen, besides that pronotum microscopically punctulate (punctules as large as cells of microsculpture); moderately shining or with pronotum sericeous. Body including femora and tibiae dark metallic green or bronze, antennae and tarsi black.

Last maxillary palpomere narrow, oval, beveled, 1.5 X longer than broad, as long as penultimate palpomere or 1.2–1.3 X longer than the latter, 1.1 X narrower than the latter, or as wide as the latter, or 1.1 X broader than the latter. Antenna inserted 1.9–2.3 X closer to clypeus than to eye, short, with antennomeres 10–11 projecting beyond pronotal base. Antennomeres 6–11 weakly broadened or narrow. Orbital lines broadly impressed, broadened forward, with steep lateral border, but these impressions present only above eye and not reaching antennal insertion.

Pronotum convex viewed from the front, broadest at mid-length, with lateral sides roundly convergent towards both ends. Anterior angles weakly or moderately produced. Anterior side of pronotum distinctly marginated only at anterior angles, and obsoletely marginated medially (in *Ch. nagaja*) or entirely marginated (in *Ch. daccordii* and *Ch. romandudkoi*), with sparse setae. Anterior setiferous pore present in *Ch. romandudkoi,* absent in others. Pronotum laterally very weakly or moderately swollen along entire length. Pronotal lateral impressions obsolete, broad, sloping, developed in posterior ¾ only; in basal ¼ with punctures larger than those at disc in *Ch. romandudkoi,* without punctures larger than those at disc in others. Punctures at pronotal disc dense, fine.

Prothoracic hypomeron almost flat, weakly convex, without impression or wrinkles along outside. Basal fold distinct (in *Ch. nagaja* and *Ch. romandudkoi*) or absent (in *Ch. daccordii*). Intercoxal prosternal process broadened posteriorly. Antero-lateral portions of prosternum flat, marginated anteriorly and posteriorly.

Metasternum entirely marginated anteriorly, with broad and convex callus between mid-coxae.

Elytron with obsolete humeral callus in *Ch. romandudkoi,* without any humeral callus in the others. Elytron covered by dense, moderately large punctures. Punctures forming slightly irregular, paired rows in *Ch. romandudkoi*, entirely irregular in the others. Intervals flat, with very fine, sparse irregular wrinkles, and with very fin punctures in *Ch. romandudkoi*. Sutural stria narrow, distinct at apical slope.

Elytral epipleura inclined outside, visible along entire length in lateral view; without setae (examined in *Ch. nagaja* and *Ch. daccordii*).

Hind wings reduced, narrow, slightly longer than metathorax in *Ch. romandudkoi,* absent in the others.

Tarsomeres 1–3 with entire sole; they slightly broadened in fore- and mid-tarsi, narrow in hind-tarsi in male; tarsomeres 1–3 narrow in female. Claw tarsomere without denticles beneath.

Pygidium with impression along entire length in *Ch. romandudkoi*, convex, without impression in the others.

Last abdominal sternite evenly convex, broadly truncate and marginated apically in male, convex in female.

Aedeagus tube-shaped, curved dorso-ventrally, with apex different, but bearing two lateral denticles. Flagellum thin, simple, exposed.

Differential diagnosis

This species group is morphologically close to the subgenus *Timarcholina* from India and Sri Lanka, and differs from it in smaller body and absence of the denticles on 4th tarsomere.

Key to species

1(4) Elytral punctures entirely irregular.

2(3) Species from Pakistan. Dorsum dark green or bronze. Pronotal lateral callus very weak. Prosternum with basal fold distinct. Aedeagus with apex anchor-shaped. Length: 5.9–6.4 mm (male), 7.0 mm (female). Figs. 1–5, 11. Pakistan, E Nepal.

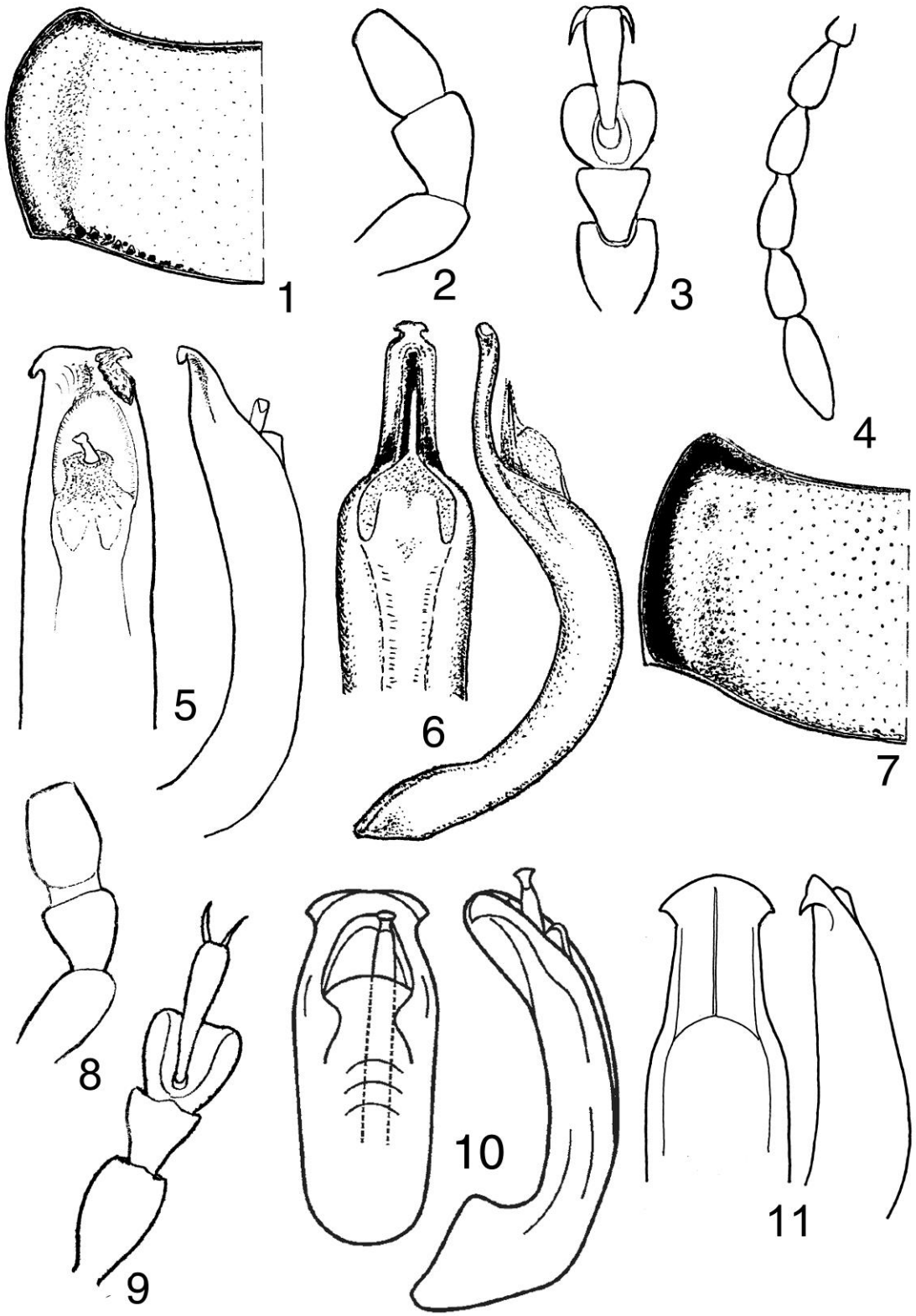
Ch. nagaja (Daccordi, 1982a)

3(2) Species from Nepal. Dorsum dark bronze. Pronotal lateral callus moderately convex. Prosternum without basal fold. Aedeagus with very long, narrow apical projection. Length: 5.6–6.7 mm (male), 7.1–7.3 mm (female). Figs. 6–9. W Nepal.

Ch. daccordii (L.Medvedev et Sprecher-Uebersax, 1999b)

4(1) Elytral punctures forming distinct, slightly irregular, paired rows. Dorsum bronze. Pronotal lateral callus weak to moderate. Prosternum with basal fold distinct. Aedeagus with apex anchor-shaped. Length: 6.0–7.0 mm (male), 7.2–7.8 mm (female). Fig. 10. E Nepal.

Ch. romandudkoi Mikhailov, 2019



Ch. (***nagaja***) **species group**: 1–5 – *Chrysolina nagaja* (?), male (Pakistan): 1 – pronotum, 2 – maxillary palpus, 3 – fore-tarsus, 4 – apex of antenna, 5 – aedeagus, dorsal and lateral view (apex partly destroyed); 6–9 – *Ch. daccordii*, male (Nepal): 6 – aedeagus, dorsal and lateral view, 7 – pronotum, 8 – maxillary palpus, 9 – fore-tarsus; 10 – Ch. *romandudkoi*, male, holotype (Nepal), aedeagus, dorsal and lateral view; 11 – *Ch. nagaja*, male (holotype, Nepal), aedeagus, dorsal and lateral view. (After: Mikhailov, 2019: 10; others – orig.)

***Ch.* (*pieli*) species group from** S-E China (Jiangxi and Henan)

Diagnosis

Body entirely dark bronze, shining; almost hemispherical, very convex, with pronotum swollen, transversely very convex; with constriction laterally and dorsally between pronotum and elytra (Figs. 1, 2). Body length 7.1–7.6 mm.

Vertex and frons finely densely punctate, punctures denser on frons than on vertex. Last maxillary palpomere short, broader than long, slightly narrower and distinctly shorter than penultimate one, similar in both sexes (Fig. 3). Ocular groove developed only above eye. Antennal insertion 2 X closer to clypeus than to eye. Antennomeres 7–11 moderately broadened (Fig. 4).

Pronotum without anterior setiferous pores; anteriorly marginated and ciliate. Lateral callus weakly convex, separated from disc only with large numerous punctures; disc and calli covered by dense, fine punctures.

Prothoracic hypomeron without basal fold; laterally impressed and obsoletely wrinkled. Prosternal process impressed along entire length and covered with wrinkled punctures. Antero-lateral portions of prosternum broad, weakly convex, marginated anteriorly and posteriorly.

Metasternum marginated anteriorly.

Elytron without humeral callus. Punctures forming abbreviated scutellar row and 9 equidistant pairs of rows; rows of each pair some confused to each other. Intervals between paired rows are flat or weakly convex, covered by dense microscopical punctules. Sutural stria absent.

Elytral epipleura inclined outside in basal ¾, well visible there in lateral view, almost horizontal in apical ¼, with sparse setae near apex.

Hind wings absent.

Pygidium without furrow.

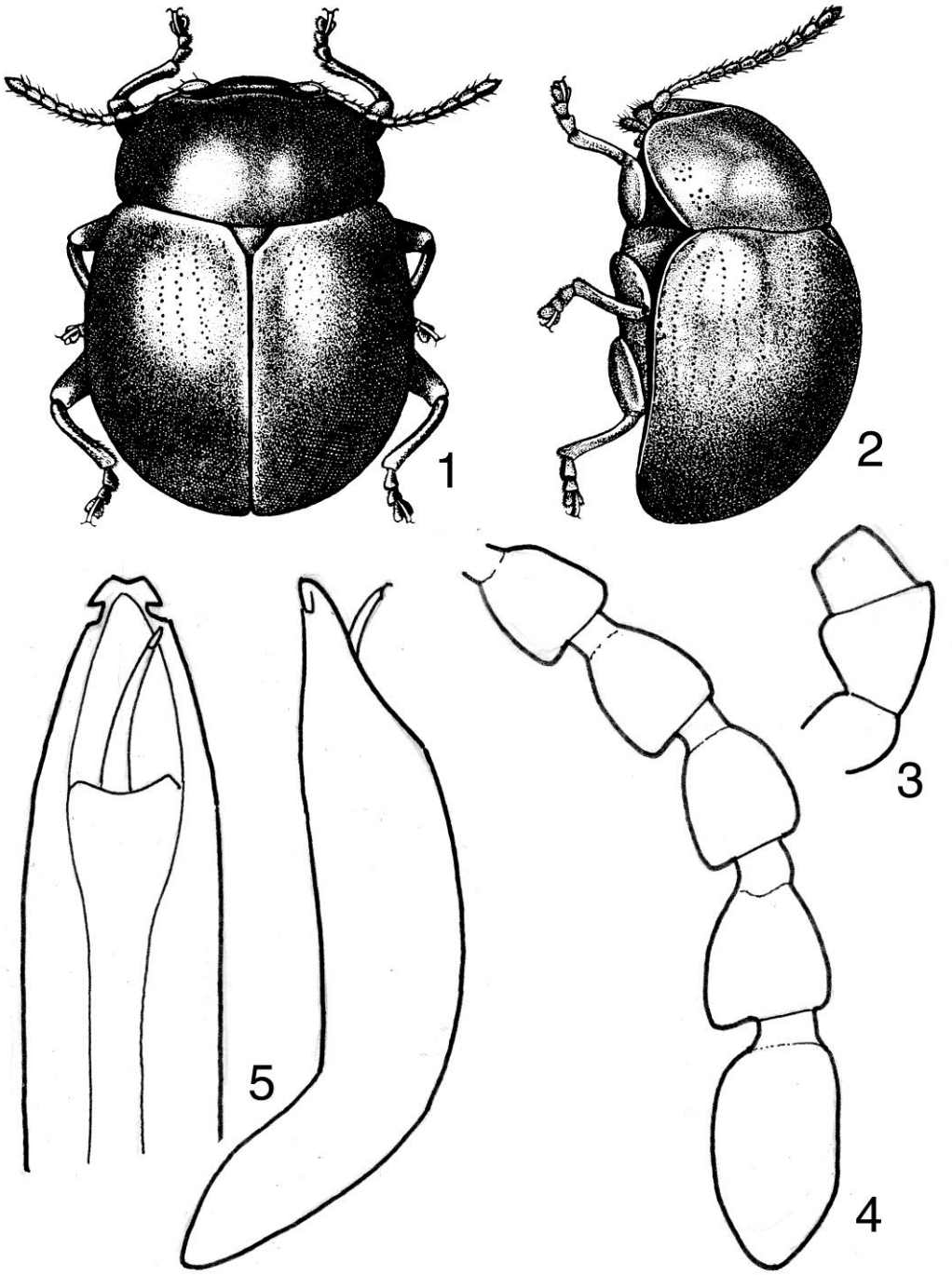
Last abdominal sternite simple, convex, broadly truncate in male, rounded in female apically.

Tarsomeres 1–3 with entire sole in both sexes, narrow, slightly broadened in male. Claw tarsomere without denticles beneath.

Aedeagus (Fig. 5) tube-shaped, curved dorso-ventrally, with apex elongate-triangular, bearing small apical appendix, separated by constriction; flagellum simple, exposed.

Differential diagnosis

This group includes one species, *Ch. pieli* Chen, 1936a occurring in S-E China. This species is well different from all other known Chinese *Chrysolina* species by the body very convex, short, pronotum inflated, without lateral impressions, aedeagus looks like that in some members of African subgenera *Chersomela* (such as *Ch. haemograpta, Ch. hebe, Ch. lineoligera, Ch. pardalina, Ch. pulchella, Ch. vulpina*, and especially *Ch. soluta*) and *Atechna*.



***Ch. pieli* figures 1–5:** 1–3 – female (Jiangxi): 1 – dorsal view (paratype), 2 – lateral view (paratype), 3 – maxillary palpus; 4–5 – male (Henan): 4 – antennomeres 7–11, 5 – aedeagus, dorsal and lateral view. (After: Chen, 1936: 1–2; others – orig.)

Ch. (*seriepunctata*) species group

Diagnosis

Body broad, very convex. Dorsum black with bronze reflection (sometimes head and pronotum with greenish reflection) or without metallic reflection; very shining, without distinct microsculpture. Antennae, legs and underside of body black with metallic reflection. Antennomeres 1–2 rufous on apex. Body length 5.2–6.4 mm.

Last maxillary palpomere broadly-oval, obliquely truncate on apex, similar to penultimate one in length and width, similar in male and female. Base of antenna placed closer to clypeus than to eye.

Pronotum broadest basally, with lateral sides arc-shaped, convergent forward, with lateral calli convex along entire length, with lateral impression broad, very shallow, obsolete along most length and slightly deepened basally, covered by broad stripe of large, dense, numerous punctures, with disc covered by dense fine punctures. Anterior side of pronotum marginated, ciliate. Anterior setiferous pore of pronotum present.

Prothoracic hypomeron weakly convex, with shallow impression and distinct transverse wrinkles laterally, without lateral border. Basal fold of prothoracic hypomeron strong.

Metasternum marginated anteriorly.

Elytron with weak humeral callus; covered by large, dense, punctures. Punctures mostly irregularly placed, partly arranged in rows near suture and laterally. Intervals between large punctures flat, covered by very fine dense punctures.

Elytral epipleura inclined outside, visible along entire length in lateral view, densely ciliate near apex.

Hind wings slightly reduced: they are broad, reaching elytral apex.

Tarsomeres1–3 with entire sole in both sexes, narrow in female, with all tarsomeres 1 slightly broadened in male. Claw tarsomere without denticles beneath.

Pygidium with distinct furrow along entire length.

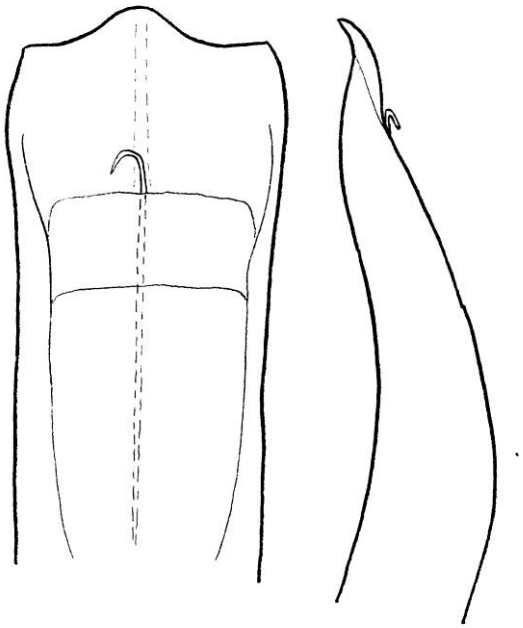
Last abdominal sternite with semicircular apical impression in male, convex in female, with apical margin arc-shaped in both sexes.

Aedeagus (Fig. 1) flat dorso-ventrally, transversely truncate and appendiculate at apex, twice curved in lateral view near apex. Flagellum simple, whip-shaped, slightly exposed.

Differential diagnosis

The single member of the present group externally looks like *Ch.* (*Allohypericia*) *koltzei* and differs in male last abdominal sternite with semicircular impression and quite different aedeagus structure.

This group includes one species, *Ch. seriepunctata* (Weise, 1887a) occurring in the Far East, Japan (Honshu), and C China (Hubei).



Ch. (***seriepunctata***) **species group**: *Chrysolina seriepunctata*, male (Russian Far East: Amur reg.), aedeagus, dorsal and lateral view. (Orig.)

Ch. (*tani*) species group mostly from Xizang

Diagnosis

Above distinctly shagreen, moderately shining (male) or sericeous (female) or head and pronotum moderately shining and elytra sericeous, or male and female sericeous dorsally. Dorsum bronze or dark brassy with greenish tint, with scutellum black, shining; underside (including elytral epipleura) and legs dark blue, or brassy, or piceous, antennae black with antennomeres 1–2 or 1–3 rufous below, or antennae piceous.

Last maxillary palpomere oval, beveled, in male 1.3 X longer than broad, 1.3 X longer and broader than penultimate palpomere or as wide as latter; in female 1.5 X longer than broad, as wide as penultimate palpomere and 1.3 X longer than latter; in male broader than in female.

Antenna inserted 1.5–2.3 X closer to clypeus than to eye. Antenna short, with antennomeres 10 and 11 project beyond pronotal base. Antennomeres 7–11 moderately or slightly broadened. Orbital line deep, with vertical outer border, not reaching antennal insertion.

Pronotum 2.0 X broader than long, with lateral sides arc-shaped. Anterior side of pronotum marginated, with setae. Anterior setiferous pores absent. Pronotum laterally weakly swollen along entire length. Pronotal lateral impressions broad and shallow, developed along entire length, slightly deepened anteriorly and posteriorly, or developed in basal ½, shallow. Lateral impressions covered by punctures which slightly larger than those at disc. Pronotum (including lateral calli) covered by fine dense punctures which as large as those at vertex or slightly larger.

Prothoracic hypomeron weakly convex or almost flat, weakly impressed and irregularly wrinkled along outside. Basal fold absent. Intercoxal prosternal process with shallow medial longitudinal impression covered by wrinkles along entire length. Antero-lateral portions of prosternum marginated anteriorly, with medial ridge and broad deep impression posteriorly, or without of ridge, flat (in *Ch. mikhailovi*).

Metasternum entirely marginated anteriorly.

Elytron without humeral callus; covered by 9 paired rows or single rows. Rows consist of moderately large or rather fine dense punctures. Rows 2, 3, 6, and 7 partly irregular, others regular, or rows mostly irregular and visible because of impunctate intervals between rows of each pair, 2–3, 4–5, 6–7, and 8–9; intervals flat, with fine wrinkles, covered by dense fine punctures; or rows regular, intervals more or less convex.

Elytral epipleura inclined outside, visible in lateral view along most part of its length, and horizontal, invisible in lateral view just before apex (in apical 1/10); with dense setae near apex.

Hind wings absent.

Tarsomeres 1–3 with entire sole in both sexes. In female tarsi narrow; in male fore- and mid-tarsomeres 1–3 and hind-tarsomeres 1 and 3 very broadened in *Ch. mikhailovi*, moderately broadened in the others. Claw tarsomere without distinct denticles beneath, however apical margin bi-denticulate under claws.

Pygidium with weak to obsolete impression in basal ½ only.

Last abdominal sternite evenly convex in male, slightly swollen in female, marginated apically in both sexes, broadly emarginated or without emargination in male, broadly truncate in female.

Aedeagus apically anchor-shaped (looks like that in *Ch. aurichalcea*); flagellum broad, tube-like or flat, exposed.

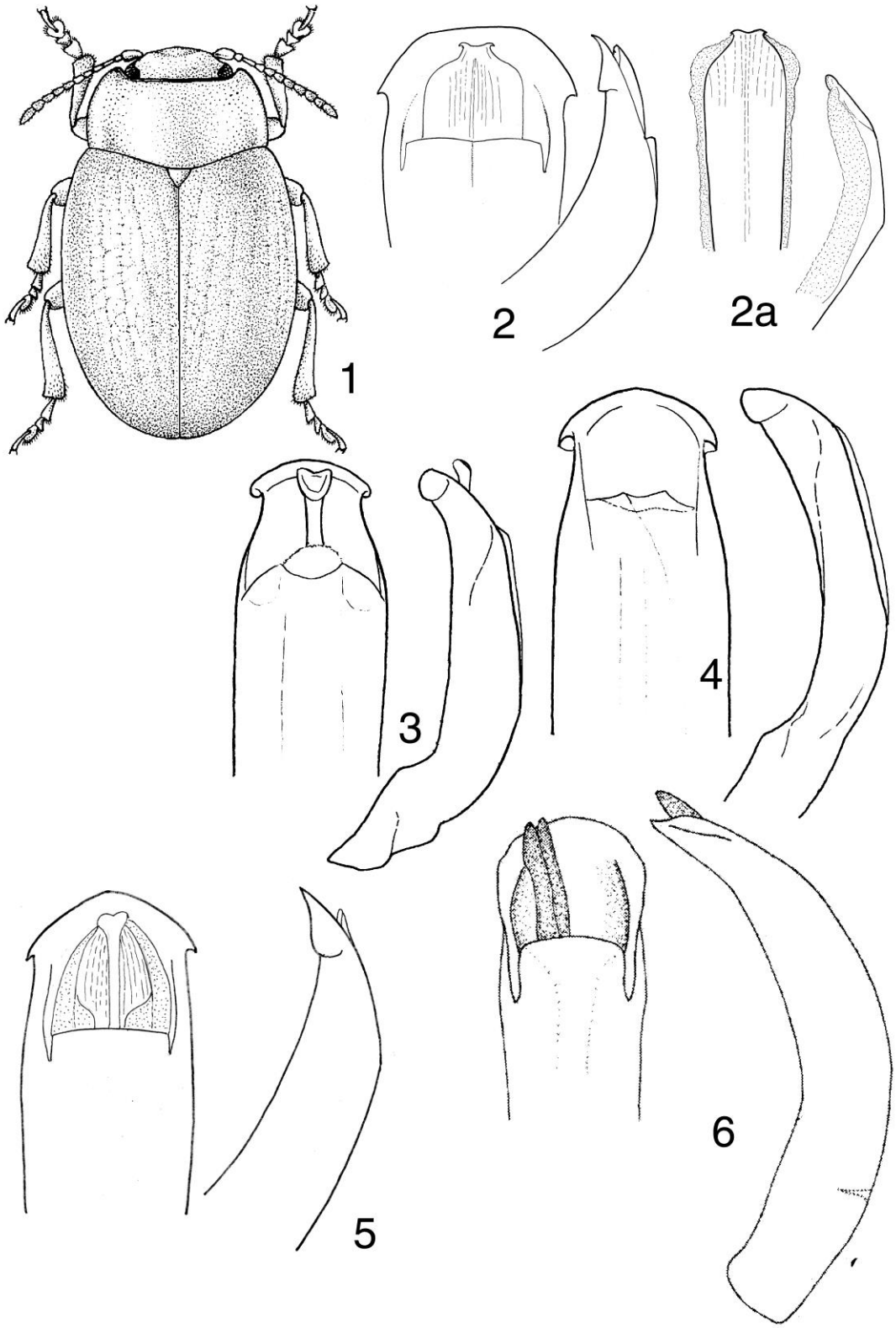
Differential diagnosis

The members of this group externally look like some species of the subgenus *Arctolina*, and differ in aedeagus anchor-shaped, without alae.

Key to species

1(2) Species from S-E Gansu and Sichuan. Elytron with paired puncture rows, which partly or mostly irregular; intervals flat. Dorsum dark brassy with greenish tint. Aedeagus with flagellum tube-shaped. Tarsomeres 1–3 with entire sole in both sexes. Length: 6.3–7.0 mm (male), 7.1 mm (female). Figs. 3, 4. *Ch. tani* Lopatin, 1998

2(1) Species from Xizang. Elytron with paired regular puncture rows. Dorsum bronze. Narrow elytral intervals (between rows 2 and 3, 4 and 5, 6 and 7) slightly convex, others almost flat (or less convex than narrow ones) or all intervals convex. Aedeagus with flagellum broad, flat. Tarsomeres 1–3 with entire sole in both sexes, female 1 tarsomere with smooth heel. Length 5.3–8.0 mm. Figs. 1, 2, 2a, 5, 6.
Ch. mikhailovi Ge et Daccordi in: Daccordi, Ge, Cui, Yang, 2011



***Ch.* (*tani*) species group figures 1–6**: 1–2 – *Chrysolina mikhailovi* (type of *Ch. markamensis*, Xizang): 1 – total dorsal view, 2 – paratype, aedeagus, dorsal and lateral view, 2a – paratype, flagellum of aedeagus; 3–4 – *Ch. tani*, aedeagus, dorsal and lateral view: 3 – male (holotype *Ch. daosana*, Gansu), 4 – male (holotype *Ch. tani*, Heilongjiang: Sandaohezi – incorrect?); 5–6 – *Ch. mikhailovi*, aedeagus, dorsal and lateral view: 5 – paratype (Xizang), 6 – male (from type series *Ch. lishangyini*, Xizang). (After: Ge, et al., 2011: 1; Daccordi, et al., 2011: 6; others – orig.)

Ch. (*zhongdiana*) species group (Sichuan, Yunnan and Gansu)

Diagnosis

Body entirely metallic or black, in some species with antennae and legs wholly or partly rufous, without metallic coloration.

Last maxillary palpomere oval (long or short), narrowly truncate, or slightly securiform, broadly truncate apically; similar in both sexes or slightly broader in male than in female.

Pronotum without anterior setiferous pores.

Prothoracic hypomeron without basal fold or with weak fold.

Metasternum marginated anteriorly.

Elytral epipleura inclined outside, visible along entire length in lateral view, apically with sparse or very few setae, or without of them at all.

Hind wings absent.

Pygidium without furrow in apical ½.

Tarsomeres 1–3 with entire sole in both sexes. Claw tarsomere without denticles.

Remark. The most species inhabit Sichuan and Yunnan Provinces of China, only one species (*Ch. warchalowskii*) is known from Gansu Province. A large number of species of this group are still undescribed.

The species of this group very differ from each other in pronotal and elytral puncturation and aedeagus structure. I separate them in 26 subgroups. Some of them represent natural groups of related species. Another ones represent "auxiliary groups" of morphologically similar but unrelated species. I follow Warchałowski (2003) who used approach "auxiliary groups" in the key to *Chrysolina* of Europe and the Mediterranean Region. The use of such groups is convenient for identification of the species.

The key proposed below also includes the species of subgenus *Timarchomela* as well as the members of the species group *Ch.* (*obovata*) of the subgenus *Pezocrosita* ("subgroup 4"), which are morphologically close to *Ch.* (*zhongdiana*) species group and also inhabit Sichuan and Yunnan Provinces.

Key to subgroups of the species

1(6) Antennae and legs entirely rufous, or antennae and tarsi rufous, femora and tibiae dark.
2(5) Antennae and legs entirely rufous.
3(4) Elytral punctures distinct. Dorsum shining or moderately shining. Last maxillary palpomere oval, as broad as penultimate one or slightly broader than latter. Pronotum with shallow, sloping lateral impressions along entire length. Prothoracic hypomeron without lateral impression and basal fold. Tarsomeres 1–3 broad in male, narrow in female. Elytral epipleura with sparse setae near apex. Aedeagus: flagellum simple, exposed. Species from Sichuan, Yunnan, Gansu. Subgroup 1.

4(3) Elytral punctures obsolete. Dorsum sericeous. Pronotal lateral impressions almost obsolete.
Ch. (*Timarchomela*) *confucii* (see above, review of the subgenus *Timarchomela*)

5(2) Antennae and tarsi entirely rufous, femora and tibiae dark. Last maxillary palpomere oval, longer than penultimate one, scarcely wider than latter in male or as wide as the latter in female. Pronotum with broad impression covered by moderately large numerous punctures along entire length; impression deeper at the base. Prothoracic hypomeron without lateral impression and basal fold. Elytra with distinct rows of moderately large punctures; rows partly irregular. Tarsomeres 1–3 narrow, similar in both sexes. Elytral epipleura with very few setae near apex. Species from Sichuan.
Subgroup 5.

6(1) Antennae and legs dark, at most antennomeres 1–2 rufous below (but antennae and tarsi sometimes partly rufous in subgroup 14, see couplet 40).

7(15) Elytra look like impunctate, with punctures microscopical, obsolete, visible only under high magnification.

8(12) Dorsum black or dark bronze.

9(10,11) Head, pronotum, and scutellum shining, elytra dull (as in *Ch. nikolskyi*). Dorsum black. Elytral epipleura without setae near apex. Species from Sichuan.
Subgroup 21.

10(9,11) Dorsum sericeous shining, black or dark bronze.
Ch. (*Timarchomela*)*: baoshanica, dalia, gansuica* (see above, review of the subgenus *Timarchomela*)

11(9,10) Dorsum shining, dark bronze. Pronotum with moderately deep, smooth, broad lateral impression along entire length. Each elytron with 5 broad convex intervals alternating with very narrow flat intervals. Male tarsomeres 1–3 very broad. Last maxillary palpomere oval, truncate, longer than penultimate, as wide as latter, similar in both sexes. Prothoracic hypomeron without basal fold, lateral impression and wrinkles. Species from Sichuan.
Subgroup 20 (in part): *Ch. jinxiaoae* Ge in: Daccordi, Ge, Cui, Yang, 2011

12(8) Dorsum bright metallic, mostly green with purple pattern including stripes and spots, or entirely bright green (rarely purple). Elytra smooth, shining or sericeous. Elytral puncture rows present, but hardly visible, consist of microscopical punctures.

13(14) Last maxillary palpomere elongate, as wide as penultimate one or hardly broader than latter. Prothoracic basal fold absent. Pronotal lateral impression different (see key to species). Elytral epipleura with sparse to very few setae near apex. Species from Sichuan.
Subgroup 9.

14(13) Male: last maxillary palpomere as long as wide, or less than 1.3 X longer than wide, distinctly wider than penultimate one; female: last maxillary palpomere hardly wider than penultimate one. Prothoracic basal fold presents. Pronotal lateral impression wide, smooth, without large punctures, developed along entire length, shallow or moderately deep, deepened apically and basally. Elytral epipleura with very few setae near apex. Species from Sichuan, very similar to each other externally. Species from Sichuan.
Subgroup 10.

15(7) Elytra with distinct punctures (if dorsum bright green with purple pattern, then see subgroups 15 and 22.).

16(17) Body elongate, weakly convex. Pronotum without lateral impressions or with very shallow impressions; impression without punctures or with fine, sparse punctures. Elytra with regular or partly irregular rows of dense fine punctures. Elytral epipleura with very few setae near apex. Species from Sichuan.
Subgroup 8.

17(16) Body oval, convex.

18(24) Elytral punctures entirely irregular, dense; elytral puncture rows absolutely absent.

19(20) Elytra with "oculate" punctures. Head and pronotum dull, with well marked microsculpture, elytra shining with entirely irregular "oculate" punctures. Pronotal lateral impression absent (scarcely impressed near base), replaced with sparse, large punctures, which more numerous near base. Pronotal lateral callus barely convex. Prothoracic hypomeron laterally with obsolete impression filled with obsolete wrinkles, basal fold absent. Last maxillary palpomere: in male: slightly securiform, scarcely broader than penultimate one, in female: broadly oval, as wide as penultimate one. In male tarsomeres 1 and 3 moderately broadened. Elytral epipleura with sparse setae near apex. Species from Yunnan.

Subgroup 18.

20(19) Elytra with simple punctures.

21(22,23) Pronotum with narrow lateral impression filled with large punctures arranged in 1 row there. Male tarsomeres 1 and 3 slightly broadened. Prothoracic hypomeron without lateral impression and basal fold. Last maxillary palpomere oval, longer than penultimate one, as wide as latter, similar in both sexes. Elytral epipleura without setae near apex. Species from Sichuan.

Subgroup 11 (in part).

22(21,23) Pronotum with very shallow lateral impression without large punctures. Species from Sichuan.

Subgroup 6 (in part, see also couplet 46): *Ch. wangboi*

23(21,22) Pronotum with shallow broad lateral impression filled with numerous, dense, deep punctures. Last maxillary palpomere oval, as wide as penultimate one. Prothoracic hypomeron with shallow lateral impression covered with wrinkles, basal fold presents. Male tarsomeres 1–3 narrow or scarcely broadened. Elytra with irregular, dense, well-marked puncturation. Elytral epipleura without setae near apex. Species from Sichuan. Female is unknown.

Subgroup 19.

24(18) Elytra with puncture rows; rows regular or irregular, sometimes hardly visible among irregular punctures in intervals, sometimes rows visible only in some places (in subgroup 11, in part).

25(37) Pronotum completely without lateral impressions (only very shallow and small impression sometimes presents at the very basal side).

26(27) Last maxillary palpomere shorter and narrower than penultimate one. Elytra with paired, slightly irregular rows; intervals flat or slightly convex. In male tarsomeres 1 and 3 broadened. Prothoracic hypomeron without lateral impression and basal fold. Elytral epipleura without setae near apex. Species from Sichuan.

Subgroup 3.

27(26) Last maxillary palpomere as long as penultimate one or longer.

28(29) Last maxillary palpomere slightly securiform, broader than penultimate one and as long as the latter.

Ch. (*Timarchomela*) *aeneolucens* (see above, review of the subgenus *Timarchomela*)

29(28) Last maxillary palpomere as wide as penultimate one or scarcely narrower.

30(33,34) Last maxillary palpomere oval, as wide as penultimate one and longer than latter. In male tarsomeres 1 and 3 broadened. Prothoracic hypomeron without distinct basal fold, with only weak impression. Elytral epipleura with very few setae near apex.

31(32) Species from Yunnan. Aedeagus broadened at level of apical orifice.
Subgroup 2.

32(31) Species from Sichuan. Dorsum black, moderately shining, without metallic reflection, slightly wrinkled, especially elytra and pronotal lateral sides. Pronotal lateral impressions replaced by numerous large wrinkled punctures.
Subgroup 6 (in part): *Ch. boccaccioi* Daccordi et Yang in: Daccordi, Ge, Cui, Yang, 2011
(It looks like *wangboi* and differs in aedeagus broadened at the tip, elytral rows distinct, and pronotal impressions obsolete or entirely absent).

33(30,34) Last maxillary palpomere oval, similar to penultimate one in length and width. Species from Yunnan.
Ch. (*Timarchomela*) *costulata* (see above, review of the subgenus *Timarchomela*)

34(30,33) Last maxillary palpomere oval, as long as penultimate one and scarcely narrower than latter, similar in both sexes. Elytra with undulate and partly irregular rows of fine dense punctures; intervals flat. Tarsomeres 1–3 moderately broad in male, narrow in female. Prothoracic hypomeron with obsolete lateral impression and wrinkles, with oblique basal fold. Elytral epipleura almost without setae (only several microscopical setae hardly visible near apex) or with sparse setae.

35(36) Species from Gansu. Elytra with undulate and partly irregular rows of fine dense punctures; intervals flat. Tarsomeres 1–3 moderately broad in male, narrow in female. Prothoracic hypomeron with obsolete lateral impression and wrinkles, with oblique basal fold. Elytral epipleura almost without setae (only several microscopical setae hardly visible near apex) or with sparse setae.
Ch. (*Timarchomela*) (in part): *nigrorugosa* and Ch. sp. 48
(see above, review of the subgenus *Timarchomela*)

36(35) Species from Sichuan. Elytra with regular paired rows of dense fine punctures; intervals flat. Tarsomere 1 broadened in male. Prothoracic hypomeron without lateral impression, wrinkles and basal fold. Elytral epipleura with several setae apically. Dorsum shining with pronotum sericeous, dark green with purple pattern: spots on vertex, pronotal lateral sides, elytral base, suture, lateral side and stripes in narrow intervals (between rows 2–3, 4–5, 6–7). Aedeagus with apex elongated-triangular, uniformly arcuate in lateral view. Length 8.8–9.0 mm. Fig. 23.
Subgroup 9 (in part): *Ch. matruelis* Lopatin, 2011

37(25) Pronotum with lateral impressions of various shape and depth, always distinct, from very shallow up to very deep, mostly visible along entire length.

38(43) Elytra with rows of sparse punctures.

39(42) Elytra with well-marked regular rows of sparse large (up to very large) punctures; 5th row consists of 9–25 punctures.

40(41) Male: tarsomeres 1–3 hardly broadened, or tarsomere 1 moderately broadened. Last maxillary palpomere oval, narrowly truncate, as wide as penultimate one, almost similar in both sexes. Antennae and tarsi sometimes partly rufous. Dorsum shining. Pronotum with shallow, broad impression; impression smooth or filled with more or less numerous punctures. Prothoracic hypomeron with obsolete lateral impression, covered by wrinkles, without basal fold. Elytral epipleura mostly with very few setae near apex, only in *Ch*. sp.19 epipleura with numerous sparse setae. Some species (*Ch*. sp.24, 25, *Ch. fascinatrix*) have setae at lateral sides of apex of aedeagus (!), and some other species (*Ch*. sp.20, 21) have pores (probably, setiferous ones) at ventro-lateral sides of apex of aedeagus. Species from Yunnan. Subgroup 14.

41(40) Male: tarsomeres 1–3 very broad. Last maxillary palpomere slightly securiform, broadly truncate apically, in male slightly broader than in female; or last palpomere oval, narrowly truncate, similar in both sexes. Pronotum with broad flattened lateral impressions covered by numerous large punctures. Prothoracic hypomeron with weak lateral impression covered by obsolete wrinkles. Basal fold very weak. Elytra with regular rows of sparse large funnel-shaped punctures which larger than those in pronotal lateral impression. Elytral epipleura with sparse setae near apex. Species from Yunnan.

Subgroup 7.

42(39) Elytra with regular paired rows of sparse fine punctures; rows poorly visible among fine punctures in intervals. Dorsum shining. Pronotum with wide, very shallow impression without large punctures along entire length (after the original description of *Ch. wangi* Lopatin, 2005a, pronotal lateral impression covered by sparse, deep punctures, elytral rows consist of large dense punctures). Tarsomeres 1–3 narrow, similar in both sexes. Prothoracic hypomeron without lateral impression, wrinkles and basal fold. Last maxillary palpomere in male: as long as wide, scarcely wider than penultimate one, in female: elongate, as wide as penultimate one. Elytral epipleura without setae near apex. Species from Yunnan.

Subgroup 12.

43(38) Elytra with rows of dense punctures.

44(45) Elytra with some intervals ridge-shaped. Intervals through one: 1) very narrow, flat, 2) broad, smooth, convex or ridge-shaped. Elytral punctures moderate or large, arranged in regular rows, strongly approximated in pairs. Pronotum with impression along entire length. Male tarsomeres 1–3 broadened. Elytral epipleura with very few setae near apex. Species from Sichuan and Yunnan.

Subgroup 20.

45(44) All elytral intervals look alike.

46(47) Elytra with rows of large, dense punctures. Rows poorly visible among large punctures in intervals. Last maxillary palpomere oval, longer than penultimate one, as wide as the latter. Pronotum with very shallow lateral impressions, which are not covered by large punctures. Prothoracic hypomeron without lateral impression, with obsolete wrinkles laterally, without basal fold. In male, tarsomeres 1–3 moderately broadened. Aedeagus with narrow long apical projection, S-shaped in lateral view. Elytral epipleura without setae near apex. Species from Sichuan.

Subgroup 6 (in part).

47(46) Elytra with rows of fine, dense punctures. All intervals flat, convex, or slightly ridge-shaped, similar to each other.

48(66) Last maxillary palpomere elongate-oval.

49(57) Last maxillary palpomere similar to penultimate one in length and width, similar in both sexes.

50(54) Dorsum sericeous or dull.

51(52,53) Dorsum sericeous because of distinct microsculpture (members of this group look like representatives of the subgenus *Timarchomela* and differ in pronotal lateral impression distinct along entire length and filled with large punctures, and in well-marked paired rows of punctures on elytra). Pronotal lateral impression shallow. In male tarsomere 1 slightly broadened. Prothoracic hypomeron with very shallow lateral impression covered by obsolete wrinkles, with beveled, very shallow basal fold. Elytra with paired rows of dense punctures. Elytral epipleura with sparse setae near apex. Species from Yunnan.

Subgroup 13.

52(51,53) Dorsum dull. Elytral rows mostly irregular and only can be traced here and there. Pronotal lateral impression moderately deep, narrow in basal ⅓, broad, shallow anteriorly. In male tarsomeres 1–3 moderately broadened. Prothoracic hypomeron without basal fold and distinct lateral impression. Elytral epipleura with dense setae near apex. Species from Gansu.

Subgroup 24.

53(51,52) Dorsum dull, black with weak blue tint on head and pronotum. Elytral rows regular, paired, but hardly visible, obsolete. Pronotal lateral impression broad, very shallow, obsolete, without large punctures. Male: tarsomeres 1–3 very broad. Prothoracic hypomeron without basal fold and lateral impression, with obsolete wrinkles laterally. Elytral epipleura with few hardly visible setae near apex. Species from Gansu.

Subgroup 26.

54(50) Dorsum moderately shining.

55(56) Dorsum moderately shining, dark green or dark blue. Elytral rows distinct, regular, slightly paired at mid-length. Pronotal lateral impression narrow and shallow, without large punctures (looks like that in *Ch. lichenis*). Male tarsomeres 1–3 moderately broadened. Prothoracic hypomeron with shallow but distinct basal fold, without lateral impression or wrinkles. Elytral epipleura with numerous but not very dense setae at apex. Species from Yunnan.

Subgroup 27.

56(55) Dorsum moderately shining, dark bronze. Elytral rows distinct, regular, paired at mid-length. Pronotal lateral impression broad and very shallow, without large punctures. Male tarsomeres 1–3 moderately broadened. Prothoracic hypomeron without distinct basal fold, without lateral impression or wrinkles. Elytral epipleura with numerous dense setae at apex. Species from Sichuan.

Subgroup 17 (in part): *Ch. hongyuanensis* Daccordi et Ge in: Ge, Daccordi, Li, Yang, 2011b

57(49) Last maxillary palpomere longer than penultimate one and as wide as the latter.

58(61) Male: tarsomeres 1–3 very broad. Prothoracic hypomeron flat or with obsolete lateral impression, covered with weak wrinkles.

59(60) Species from Sichuan and Yunnan. Elytra with regular or undulate rows of dense fine punctures, intervals convex or slightly ridge-shaped. Prothoracic hypomeron without basal fold. Last maxillary palpomere similar in both sexes. Elytral epipleura with sparse or very few setae near apex. Some species (*Ch*. sp. 30, 31) have pores (probably, setiferous ones) at ventro-lateral sides of apex of aedeagus.

Subgroup 16.

60(59) Species from Gansu. Elytra with undulate, hardly traced rows of dense fine punctures, intervals flat. Prothoracic hypomeron with weak basal fold. Elytral epipleura with dense numerous setae near apex.

Subgroup 25.

61(58) Male: tarsomeres 1–3 slightly broadened.

62(63) Pronotal lateral impression very shallow, broad, developed along entire length or only near base. Prothoracic hypomeron flat or with obsolete lateral impression, covered with wrinkles, without basal fold. Elytra with regular rows of fine dense punctures and flat or convex intervals. Last maxillary palpomere oval, as wide as penultimate one, similar in both sexes. Beetles look like members of Subgroup 16, and differ in rather narrow tarsomeres 1–3 in male. One species (*Ch*. sp. 32) has pores (probably, setiferous ones) at ventro-lateral sides of apex of aedeagus. Elytral epipleura with sparse or very few setae near apex. Species from Sichuan.

Subgroup 17.

63(62) Pronotal lateral impression narrow at least basally.

64(65) Pronotal lateral impression narrow along entire length. Species from Sichuan.

Subgroup 11 (in part) (see also couplet 21).

65(64) Pronotum with narrow lateral furrow near base and broad impression covered by large punctures anteriorly. Last maxillary palpomere elongate oval, almost similar in both sexes. Prothoracic hypomeron with weak impression and wrinkles laterally. Elytra with paired regular rows of fine, dense punctures; rows poorly visible among punctures in intervals.

Ch. (*Pezocrosita*) (*obovata*) group: *Ch. regeli* and *Ch. freyensis* (see above, review of the subgenus *Pezocrosita*) (subgroup 4)

66(48) Last maxillary palpomere as wide as long, or not more than 1.3–1.5 X longer than wide, slightly securiform or broadly oval. In male last palpomere slightly or distinctly broader than penultimate one, or as wide as latter.

67(70) Pronotal lateral impression filled with large punctures.

68(69) Dorsum brightly green with purple pattern, shining or dull. Beetles similar to members of Subgroup 9 and differ by elytral puncturation which always well marked, arranged in regular paired rows (these rows sometimes poorly visible because of fine, dense punctures in intervals). Last maxillary palpomere short, slightly securiform or broadly oval, slightly broader than penultimate one (in male) or as wide as the latter (in female). Prothoracic basal fold absent or weakly developed. Elytral epipleura with sparse or very few setae near apex. One species (*Ch*. sp. 26) has setae at lateral sides of apex of aedeagus (!), and another species (Ch. sp. 28) has pores (probably, setiferous ones) at ventro-lateral sides of apex of aedeagus. Species from Sichuan.

Subgroup 15.

69(68) Dorsum dark bronze. Elytral epipleura with dense setae near apex. Species from Yunnan, Gansu.

Subgroup 23.

70(67) Pronotal lateral impression smooth or filled with fine punctures. Last maxillary palpomere as wide as penultimate one. Prothoracic basal fold weak or absent. Elytral epipleura with very sparse setae near apex. Species from Yunnan, Gansu, one species also occurs in Xinjiang.

Subgroup 22.

Keys to species by subgroups 1–27.

Subgroup 1. Key to species.

1(2) Species from Gansu. Dorsum black, shining. Elytra with paired rows of fine punctures. Pronotum with lateral impression along entire length. In male, fore- and mid-tarsomeres 1 broadened, slightly narrower than tarsomere 3. Aedeagus of male (holotype) was lost before the preparing of the original description, other males unknown. Length 5.7 mm (male), 7.2 mm (female).

Ch. warchalowskii Lopatin, 2005a

2(1) Dorsum metallic.

3(6) Species from Sichuan. Dorsum green or with greenish tint: coppery green, or reddish purple with green reflection, moderately shining. Elytra with paired rows of fine, dense punctures; rows slightly irregular, poorly visible among dense punctures of intervals. Pronotum with shallow broad lateral impression along entire length. Aedeagus broadly rounded at apex, with 2 apical denticles on underside.

4(5) Apical opening of aedeagus longer than in the following species. In male, fore- and mid-tarsomeres 1–3 very broad. Dorsum green or coppery green. Length 5.7–6.4 mm (male), 7.0 mm (female). Fig. 1. Sichuan.

Ch. claripes Lopatin, 2002

5(4) Apical opening of aedeagus shorter than in the previous species. In male, fore- and mid-tarsomeres 1–3 moderately broad. Dorsum reddish purple with green reflection. Length 6.9–7.4 mm. Figs. 97, 98. W Sichuan.

Ch. lijieae Daccordi et Yang in: Daccordi, Ge, Cui, Yang, 2011

6(3) Dorsum violet, blue, bronze, or dark coppery, very or moderately shining.

7(8) Species from Sichuan. Dorsum bronze. Pronotum with lateral depression, filled with punctures, these punctures much denser near base. Elytra with irregular single puncture rows, punctures larger than those of side of pronotum. Length 7.8 mm. Fig. 78. Sichuan.

Ch. luobinwangi Ge et Daccordi in: Daccordi, Ge, Cui, Yang, 2011

8(7) Species from Yunnan.

9(10) Elytral paired rows consist of moderate or large, sparse punctures (10–16 punctures in 5th row). Rows well visible on the background of very fine, sparse puncturation of intervals. Aedeagus moderately broadened in apical ½, then it is trapezoidal narrowed at level of apical orifice, with emargination on the tip; apex of aedeagus bent down in lateral view. Dorsum dark coppery or violet with golden reflection. Length 4.9–5.6 mm (male), 5.0–6.0 mm (female). Figs. 10–17. Yunnan.

Ch. fascinatrix Lopatin, 1998

10(9) Elytral paired rows consist of fine, dense punctures (26–27 punctures in 5th row). Rows poorly visible on the background of fine puncturation of intervals.

11(12) Elytral puncture rows not quite regular. Aedeagus not broadened in apical ½, it is roundly narrowed at level of apical orifice, narrowly drawn out on the tip; apex of aedeagus not bent down in lateral view. Dorsum shining, bluish green or violet. Length 5.7–7.1 mm. Fig. 45. Yunnan.

Ch. sp. 1

12(11) Elytral puncture rows regular. Aedeagus broadened in apical ½; slightly emarginated at the top; apex of aedeagus bent down in lateral view. Dorsum shining, dark coppery. Length 6.1–6.9 mm. Aedeagus looks like that in *Ch. fascinatrix*, but medial lobe covering the apical orifice bears long and narrow apical projection. (species belonging also to Subgroup 23)

Ch. liqingzhaoae Daccordi et Ge in: Daccordi, Ge, Cui, Yang, 2011

Remark. *Ch. fascinatrix, Ch. liqingzhaoae* and *Ch.* sp. 1 form a natural group that also includes *Ch.* sp. 20, *Ch*. sp. 24 (both from the subgroup 14), and *Ch. wangi* (subgroup 12).

Subgroup 2. Key to species.

1(5) Aedeagus moderately roundly broadened at level of apical orifice.

2(3,4) Aedeagus with emargination on the tip, with apical denticles on underside. Dorsum bronze, shining. Elytral intervals covered by punctures, which the same large and dense as those at pronotal disc. Length 5.5–6.4 mm. Fig. 46. Yunnan.

Ch. sp. 2

3(2,4) Aedeagus with narrow round-rectangular apical lobe. Dorsum coppery or coppery purple, with green apical and basal margins of pronotum and elytral suture. Pronotum shining, elytra dull. Elytral intervals covered by punctures, which are finer and sparser than those on pronotal disc. Length 6.2–7.6 mm. Fig. 44. Yunnan. *Ch*. sp. 4

4(2,3) Aedeagus broadly rounded at apex. Dorsum bronze. Elytral intervals covered by small and sparse punctures. Length 5.0 mm (male), female is unknown. Figs. 82, 83. Yunnan.

Ch. shuyongi Ge et Daccordi in: Ge, Daccordi, Li, Yang, 2011b

5(1) Aedeagus strongly roundly broadened and obtuse at apex. Dorsum coppery, dull. Elytral intervals covered by punctures which as large as those at pronotal disc, but sparser than the latter. Length 5.5 mm (male), female is unknown. Fig. 42. Yunnan.

Ch. sp. 35

Remark. *Ch. shuyongi*, *Ch.* sp. 4, and *Ch*. sp. 35 form a natural group. *Ch*. sp. 2 similar with the members of the subgroup 14 in the aedeagus structure (apical emargination and apical denticles on underside).

Subgroup 3.

This subgroup includes one species, *Ch*. sp. 5 from Sichuan. Dorsum shining or sericeous, bicolorous: 1) head and pronotum golden, elytra green, or 2) head and pronotum bronze, elytra coppery. Aedeagus "bottle-shaped". On the base of aedeagus structure, it is similar to the members of the subgroup 6, and differs in pronotal impression entirely absent, and male tarsomeres 1–3 narrow. Length 6.3 mm (male), 7.0–7.7 mm (female). Fig. 70.

Subgroup 4.

Two members of the subgenus *Ch.* (*Pezocrosita*) (*obovata*) species group: *Ch. regeli* and *Ch. freyensis* are included here (see above the key to the respective species group).

Subgroup 5.

This subgroup includes one species, *Ch*. sp. 6 from Sichuan. Dorsum coppery, sericeous. Aedeagus with narrow, beak-like apical projection, with 2 apical denticles on underside. Length 6.5–6.8 mm (male), 8.0 mm (female). Fig. 72.

Subgroup 6. Key to species.

1(2) Dorsum bronze, shining. Pronotum with shallow, but distinct lateral impression. Elytra with paired rows of large dense punctures. Apical projection of aedeagus not broadened; it is asymmetrical in the single male being at my disposal. Is it probably a monstrous or a normal structure characteristic of this species? Length 7.2 mm (male). Female is unknown. Fig. 73. Sichuan.

Ch. sp. 8.

2(1) Dorsum black.

3(4) Elytra with punctures entirely irregular. Pronotum with shallow, but distinct lateral impression. Apical projection of aedeagus not broadened. Surface of pronotum and elytra slightly wrinkled. Length 7.6–8.0 mm. Fig. 32. W Sichuan.

Ch. wangboi Daccordi et Yang in: Daccordi, Ge, Cui, Yang, 2011

4(3) Elytra with irregular unpaired puncture rows. Pronotum almost without lateral impression. Apical projection of aedeagus broadened before the tip. Length 7.0–7.7 mm. Fig. 33. W Sichuan.

Ch. boccaccioi Daccordi et Yang in: Daccordi, Ge, Cui, Yang, 2011

Remark. *Ch. wangboi* and *Ch. boccaccioi* similar to *Ch.* sp. 5 (subgroup 3) in the aedeagus structure, and differ in dorsal coloration black, and male tarsomeres 1–3 broad.

Subgroup 7. Key to species.

1(2) Aedeagus arcuate in lateral view. Apex of aedeagus broadly rounded. Head and pronotum violet, elytra blackish violet with slight metallic green tinge. Length 8.2 mm (male), 9.4 mm (female). Fig. 29. Yunnan.

Ch. yunnana Lopatin, 2008

2(1) Aedeagus S-shaped in lateral view.

3(4) Dorsum dark coppery, moderately shining or sericeous. Aedeagus parallel-sided at apical orifice, and rounded at apex. Length 6.8–8.1 mm. Fig. 71. Yunnan.

Ch. sp. 9 (probably, variability of *Ch. nixiana*)

4(3) Dorsum shining. Pronotum blackish green, elytra dark coppery. Aedeagus slightly constricted at sides of apical orifice and roundly triangular at apex. Length 7.5 mm (male). Female is unknown. Fig. 30. N Yunnan.

Ch. nixiana Lopatin, 2008

Subgroup 8. Key to species.

1(2) Dorsum black with weak metallic tint. Pronotum without lateral impressions or with only obsolete impression near base. Aedeagus shorter and broader than in next species. Length 8.5–8.6 mm. Fig. 4. Sichuan.

Ch. infernalis Lopatin, 2007

2(1) Dorsum dull metallic, head and pronotum coppery, elytra green, sometimes partly coppery. Pronotum with broad, shallow lateral impressions. Aedeagus longer and narrower than the previous species. Length 7.0–8.0 mm. Figs. 20, 77. Sichuan.

Ch. kippenbergi Lopatin, 2008

Remark. Species of this group have some external similarities, but differ in many features.

Subgroup 9. Key to species (*Ch. matruelis* belongs to this group, however it is included in a key to subgroups (couplet 36) separately, because of pronotal lateral impressions entirely absent, and elytral puncture distinct).

1(5) Pronotal lateral impression very weak, obsolete.

2(3) Aedeagus S-shaped in lateral view, with apex short-triangular. Dorsum moderately shining. Head green, pronotum and elytra dark violet, with blurred green reflection on pronotal lateral sides and elytral basal side. Length 5.5 mm (male), female is unknown. Fig. 26. N Sichuan.

Ch. korotjaevi Lopatin, 2009

3(2) Aedeagus S-shaped in lateral view, with apex elongate-triangular. Dorsum green, shining. Length 6.1 mm (male), female is unknown. Fig. 67. Sichuan.

Ch. sp. 13

4(1) Pronotal lateral impression distinct.

6(9,12,19) Pronotal lateral impression smooth or filled with small punctures, this impression broad, shallow along entire length, slightly deepened basally and apically or only apically. Aedeagus more or less S-shaped in lateral view.

7(8) Aedeagus narrowly rounded apically, without apical denticles and apical setae; weakly S-shaped in lateral view; apical orifice short. Dorsum weakly shining. Head and pronotum

green, elytra blue with purple reflection, or head and pronotum blue, elytra violet, or entirely green dorsally. Length 6.6–7.6 mm. Fig. 66. Sichuan, Gansu.

Ch. sp. 12

8(7) Aedeagus with apical setae (!); strongly S-shaped in lateral view; apical orifice long. Dorsum shining. Head and pronotum green, elytra violet. Length 6.5–7.0 mm. Fig. 6. Sichuan.

Ch. sichuanica Lopatin, 2002

9(6,12,19) Pronotal lateral impression broad along entire length because it extends to a flattened lateral callus, filled with numerous large punctures.

10(11) Pronotal lateral impression particularly broad. Aedeagus with short "beak-shaped" apical projection. Body smaller, unicolorous, usually green, rarely purple. Length 6.0–7.3 mm. Fig. 74. Sichuan.

Ch. sp. 10

11(10) Pronotal lateral impression narrower. Body larger, elytra green, each with 4 purple stripes. Length 8.2 mm. Figs. 86, 96. Sichuan.

Ch. mirabilis (Daccordi, 1976c)

12(6,9,19) Pronotal lateral impression forming narrow, deep furrow at least basally.

13(14) Pronotal lateral impression forming short, narrow, deep furrow near base and weak impression filled with deep punctures anteriorly. Aedeagus rounded at apex. Dorsum shining, dark green, with dark purplish violet head, pronotum, elytral base and suture. Length 5.5 mm. Fig. 21. Sichuan.

Ch. songpana Lopatin, 2007

14(13) Pronotal lateral impression forming deep, narrow furrow along entire length.

15(16) Dorsum sericeous or weakly shining. Aedeagus with apex {-shaped. Dorsum green, head and pronotum with diffused purple or golden red areas (mostly at sides), each elytron with 3–4 narrow purple longitudinal stripes: along suture, 1–2 on disc in basal ½, and along lateral side; innermost stripe marginated interiorly with golden, outermost stripe marginated laterally by golden. Length 8.5–9.5 mm. Fig. 22. Sichuan.

Ch. nesterovae Lopatin, 2011

16(15) Dorsum shining. Aedeagus with apex truncate or rounded.

17(18) Aedeagus with apex bearing rectangular protrusion. Dorsum green, head with diffused golden and purple areas, pronotum with golden lateral calli and diffused purple areas, elytra marginated with narrow purple stripe along base, lateral side and suture. Length 7.7–8.2 mm. Fig. 75. Sichuan.

Ch. sp. 11

18(17) Aedeagus with apex rounded. Dorsum reddish purple, with green shining, elytron green, marginated with purple and with 3 narrow purple stripes. Elytral relief more distinct in some specimens: large dense, but very shallow, almost obsolete punctures irregularly placed in intervals between 3 narrow smooth stripes or slightly convex ridges on each elytron. Length 7.0–9.0 mm. Fig. 34. N Sichuan.

Ch. sicieni Ge et Yang in: Daccordi, Ge, Cui, Yang, 2011

19(6,9,12) Pronotal lateral impression weak, broad for most length, with short, shallow furrow basally. Dorsum green with purple areas on head and pronotum, each elytron with 5 narrow purple stripes. Length 8.0–8.5 mm. Fig. 5. Sichuan.

Ch. davidiani Lopatin, 2002

Subgroup 10. Key to species.

1(4) Aedeagus with 2 denticles at apex on underside. Pronotum with deep lateral impression.
2(3) Aedeagus emarginated at the tip; more curved in lateral view. Dorsum shining, green or bluish green. Length 7.0–7.6 mm. Fig. 68. Sichuan.

Ch. sp. 14

3(2) Aedeagus truncate at the tip, with 2 apical denticles on underside; less curved in lateral view. Dorsum shining, bronze, or golden black, or black with weak violet reflection, or green with blurred purple reflection along lateral sides of pronotum, elytral basal and lateral sides. Length 7.0–8.4 mm. Figs. 25, 69. N Sichuan.

Ch. baimana Lopatin, 2009

4(1) Aedeagus with trapezoidal apex, without apical denticles. Pronotal lateral impression shallow. Dorsum shining, bronze. Length 6.9–8.0 mm. Fig. 37. Sichuan.

Ch. sp. 16

Subgroup 11. Key to species.

1(2) Apex of aedeagus trapezoidal. Dorsum moderately shining, bronze with weak greenish tint on pronotum. Length 5.5–6.5 mm. Fig. 2. Sichuan.

Ch. jiangi Lopatin, 2006

2(1) Apex of aedeagus anchor-shaped. Dorsum moderately shining, golden green, with pronotum or elytra sometimes bluish. Length 5.5–6.4 mm. Fig. 3. Sichuan.

Ch. geae Lopatin, 2006

Subgroup 12.

This subgroup includes one species, *Ch. wangi* Lopatin, 2005a occurring in Yunnan. Dorsum bronze, moderately shining, sometimes with pronotum sericeous. Pronotum with wide, very shallow impression without large punctures along entire length, elytra with regular paired rows of sparse fine punctures, rows poorly visible among fine punctures in intervals in the holotype examined (pronotal lateral impression covered by sparse, deep punctures, elytral rows consist of large dense punctures according to the original description of *Ch. wangi* Lopatin, 2005a,). Aedeagus "beak-shaped", with 2 apical denticles on underside. Length 5.7–7.1 mm. Fig. 8.

Subgroup 13.

This subgroup includes one species, *Ch*. sp. 17 from Yunnan. Dorsum sericeous, bronze. Aedeagus with apex elongate triangular, narrowly emarginated on the tip. Length 7.9–8.3 mm. Fig. 38.

Subgroup 14.

Species are very similar to each other and differ mostly by the aedeagus structure.
1) Apex of aedeagus broadened, roundly-trapezoidal, with apical denticles on underside. 5th elytral row consists of 9–17 punctures. Dorsum coppery. Length 5.5–6.6 mm. Fig. 39. Yunnan.

Ch. sp. 18

2) Apex of aedeagus broad, flattened, truncate, with two transparent "windows", without apical denticles. 5th elytral row consists of 10–11 punctures. Dorsum green. Length 7.0–8.0 mm. Fig. 40. Yunnan.

Ch. sp. 19

3) Apex of aedeagus broadened, with short beak-shaped projection, with apical denticles on underside. 5th elytral row consists of 12–14 punctures. Dorsum green. Length 5.4 mm (male), female is unknown. Fig. 41. Yunnan.

Ch. sp. 20

4) Apex of aedeagus {-shaped, without apical denticles. 5th elytral row consists of 12–20 punctures. Dorsum brassy or bronze. Length 5.3–5.9 mm (male), female is unknown. Fig. 53. Yunnan.

Ch. sp. 21

5) Similar to *Ch*. sp. 18 (point number 1), but differing in elytral punctures very large, 12 punctures in 5th row. Dorsum brassy. Length 5.2 mm (male), female is unknown. Fig. 54. Yunnan.

Ch. sp. 22.

6) Apex of aedeagus elongated, narrowed, with groove dorsally and small emargination apically, with apical denticles on underside. 5th elytral row consists of 15–19 punctures. Dorsum bronze. Length 5.1–5.7 mm (male), 6.0–6.8 mm (female). Fig. 57. Yunnan.

Ch. sp. 23

7) Apex of aedeagus broadened, with short beak-shaped projection, equipped with setae (!), with apical denticles on underside. 5th elytral row consists of 18–28 punctures. Dorsum blackish bronze, or brassy, or golden green. Basal ½ of antenna rufous with antennomere 1 dark dorsally. Length 4.7–5.5 mm (male), 6.1–6.5 mm (female). Fig. 51. Yunnan.

Ch. sp. 24

8) Apex of aedeagus roundly broadened, with narrow apical emargination, without apical denticles on underside. 5th elytral row consists of 17–20 punctures. Dorsum black or brassy. Antennae rufous with dark apical segments. Tarsi bright brown. Length 5.5 mm (male), female is unknown. Fig. 55. Yunnan.

Ch. sp. 25.

9) Apex of aedeagus broadened, with short beak-shaped projection, equipped with setae (!), with apical denticles on underside. 5th elytral row consists of 9–13 punctures. Dorsum black, or blackish bronze, or brassy. Antennae entirely dark or basal ½ of antenna rufous. Length 5.5–6.1 mm. Figs. 10–17. Yunnan.

Ch. fascinatrix Lopatin, 1998 (see also subgroup 1)

10) Aedeagus slightly broadened at sides of apical orifice, with double apical callus, separated from each other by furrow and slightly separated by lateral constriction at their bases. Apical denticles not developed on underside. 5th elytral row consists of 9 punctures. Dorsum dark bronze. Antennae entirely dark with antennomeres 1 and 2 reddish on underside. Length 9.0 mm (male), female is unknown. Fig. 87. Yunnan.

Ch. foveopunctata (Fairmaire, 1888a)

Subgroup 15. Key to species.

1(2) Pronotal lateral impression narrow, moderately deep, filled with large punctures and wrinkles, deepened basally and apically. Basal fold of prothoracic hypomeron weak. Male tarsomeres 1–3 very broad. Dorsum green, elytra narrowly marginated with purple at basal and lateral sides and along suture. Length 5.4–7.0 mm. Fig. 60. Sichuan.

Ch. sp. 28

2(1) Pronotal lateral impression broad, shallow, filled with large, more or less dense punctures.

3(4) Male tarsomeres 1–3 slightly broadened. Dorsum shining, green, with elytral base and scutellum violet. Basal fold of prothoracic hypomeron absent. Length 5.9–6.5 mm. Fig. 56. Sichuan.

Ch. sp. 26

4(3) Male tarsomeres 1–3 very broad. Basal fold of prothoracic hypomeron weak. Dorsum dull; head and pronotum green, elytra mostly purple, with narrow diffused green areas, or dorsum green with purple stripes at anterior and posterior sides of pronotum, and along basal, lateral, and sutural sides of elytron, or dorsum green with elytra bearing purple basal, lateral, sutural and 2 discal (in intervals 2–3 and 4–5) stripes. Length 6.2–6.8 mm. Figs. 31, 58. Sichuan.

Ch. pingchuana Lopatin, 2013

Subgroup 16. Key to species.

1(6) Pronotal lateral impression shallow to very shallow. Dorsum unicolorous bronze.

2(3) Pronotal lateral impression without large punctures. Dorsum weakly shining or sericeous. Species from Yunnan. Length 6.5–7.0 mm. Fig. 59.

Ch. sp. 29

3(2) Pronotal lateral impression filled with numerous large punctures.

4(5) Aedeagus with apical triangle shorter. Dorsum weakly shining. Species from Yunnan. Length 6.6 mm (male), female is unknown. Fig. 62.

Ch. sp. 30

5(4) Aedeagus with apical triangle longer. Dorsum shining. Species from Sichuan. Length 6.2 mm. Fig. 76.

Ch. sp. 41

6(1) Pronotal lateral impression moderately deep or rather deep, uneven. Species from Yunnan.

7(8) Pronotal lateral impression moderately deep, narrow, deepened near base. Dorsum sericeous. Head and pronotum green, elytra coppery. Length 6.4 mm (male), female is unknown. Fig. 63. Yunnan.

Ch. sp. 31

8(7) Pronotal lateral impression broad, uneven, with deep large cavities near base and at mid-length, these cavities filled with coarse and confluent, wrinkled punctures. Dorsum coppery with purple tint. Length 6.0 mm. Figs. 18–19, 28, 100–103. Yunnan.

Ch. zhongdiana Chen et Wang, 1984

Subgroup 17. Key to species.

1(2) Elytra with rows of "oculate" punctures: each puncture surrounded by a spot with a very sharp microsculpture, well-marked at smooth background. Dorsum black, with diffused bronze spots on head and pronotum, and bronze spot, surrounding elytral punctures. Length 6.0–7.4 mm. Fig. 65. Sichuan.

Ch. sp. 32

2(1) Elytra with rows of simple punctures.

3(4) Dorsum weakly shining or sericeous, bronze. Elytral intervals slightly convex. Length 5.6–7.3 mm. Fig. 64. Sichuan.

Ch. sp. 33

4(3) Dorsum very shining. Elytral intervals flat.

5(8) Pronotal lateral impression without large punctures.

6(7) Aedeagus triangularly narrowed at apex. Dorsum bronze. Length 5.5 mm. Fig. 52. Sichuan.
Ch. sp. 34

7(6) Aedeagus with broad apical lobe, separated with constriction at sides (it slightly looks like anchor-shaped). Dorsum bronze. Length 5.7–6.1 mm. Figs. 80, 81. Sichuan.
Ch. hongyuanensis Daccordi et Ge in: Ge, Daccordi, Li, Yang, 2011b

8(5) Pronotal lateral impression with large, sparse punctures. Aedeagus with apical emargination. Dorsum dark coppery. Length 6.0 mm (male), female is unknown. Fig. 48. Sichuan.
Ch. sp. 36

Subgroup 18.

This subgroup includes one species, *Ch*. sp. 37 from Yunnan with very characteristic "oculate" punctures on elytra: each puncture surrounded by a spot with a very sharp microsculpture, well-marked at smooth background. Due to this feature, the beetle resembles *Ch*. sp. 32 (subgroup 17) but differs in elytral punctures entirely irregular. Dorsum black. Length 7.6–8.8 mm. Fig. 50.

Subgroup 19.

This subgroup includes one species, *Ch*. sp. 38 from Sichuan. Dorsum bluish green, shining. Length 5.6 mm (male), female is unknown. Fig. 47.

Subgroup 20. Key to species.

1(2) Species from Yunnan. Dorsum brassy green. Maxillary palpomeres 3 and 4 similar in length, in male 4th palpomere scarcely wider than 3rd, in female palpomeres 3 and 4 similar in width. Pronotal lateral impression filled with large punctures which denser basally. Elytra with paired puncture rows. In male all tarsomeres 1 slightly broader than tarsomeres 3. Length 6.4–8.7 mm. Fig. 49.
Ch. sp. 39

2(1) Species from Sichuan. Dorsum dark bronze. Maxillary palpomere 4 longer than 3. Pronotal lateral impression smooth. Elytra with single 1st puncture row and four pairs of rows between calli, these rows hardly visible, obsolete. In male tarsomeres 1 as wide as tarsomeres 3. Length 6.8–8.1 mm. Fig. 35.
Ch. jinxiaoae Ge in: Daccordi, Ge, Cui, Yang, 2011

Subgroup 21.

This subgroup includes one species, *Ch. libaii* Daccordi et Ge in: Daccordi, Ge, Cui, Yang, 2011 occurring in N Sichuan. Dorsum black, without distinct punctures, head and pronotum shining (or slightly sericeous in some females), elytra dull, microscopically reticulated (as in *Ch. nikolskyi*). Pronotal lateral impression devoid of punctures, broad, shallow along almost entire length, slightly deepened and furrow-shaped near base and apex. Prothoracic hypomeron without distinct lateral impression, wrinkles and basal fold. Pygidium without distinct furrow. Male tarsomeres 1–3 broad to very broad. Male last maxillary palpomere oval, as wide as penultimate, longer than latter, similar in both sexes. Length 7.0–8.3 mm. Fig. 36.

Subgroup 22. Key to species.

1(10) Aedeagus without constriction on lateral sides.

2(7) Aedeagus without apical denticles ventrally.

3(6) Aedeagus broad. Species from Sichuan.

4(5) Apex of aedeagus broadly truncate. Head and pronotum green mixed with reddish purple, elytra green with 5 longitudinal purple stripes. Antennae and tarsi reddish brown. Length 5.8 mm (male), female is unknown. Fig. 79.

Ch. luyoui Daccordi et Ge in: Daccordi, Ge, Cui, Yang, 2011

5(4) Apex of aedeagus rounded; with flagellum narrow, whip-shaped. Pronotal lateral impression deep, furrow-shaped basally and apically, obsolete at mid-length. Dorsum shining, green, with violet tint at lateral sides of pronotum and elytra. Length 6.0 mm (male), female is unknown. Externally very similar to *Ch. viridiopaca*, however aedeagus different; besides that, frons very convex, smooth medially and covered by punctures laterally in *Ch. rotundata*, frons less convex and evenly covered by punctures in *Ch. viridiopaca*. Fig. 7.

Ch. rotundata Lopatin, 2002

6(3) Aedeagus narrow. Dorsum moderately shining, green with purple pattern: diffuse pattern on head and pronotum, 3–4 broad stripes mostly connected to each other on elytron. Basal fold of prothoracic hypomeron weak. Length 6.1–6.2 mm. Species from Gansu. Fig. 91.

Ch. sp. 44

7(2) Aedeagus with apical denticles ventrally. Species from Sichuan.

8(9) Male tarsomeres 1–3 moderately broadened in fore- and mid-tarsi, narrow in hind-tarsi. Pronotal lateral impression deep, furrow-shaped apically and basally, obsolete at mid-length; lateral sides evenly rounded. Dorsum green, with purple: vertex, pronotal disc and lateral calli, elytral suture, lateral side and diffuse discal pattern. Length 5.7–6.9 mm. Species from Sichuan. Fig. 92.

Ch. viridiopaca Lopatin, 2004

9(8) Male tarsomeres 1–3 narrow, slightly broader than respective in female. Pronotal lateral impression broad, moderately deep along entire length; lateral sides almost straight, rounded only anteriorly. Dorsum shining, blackish green with weak violet reflection, or green with diffuse purple pattern, mostly with purple frons, anterior side and lateral calli of pronotum, elytral suture and lateral margin. Species from Sichuan. Externally looks like *Ch*. sp. 44, 45, but aedeagus with apical denticles. Aedeagus triangular at apex with apical margin shallowly and narrowly emarginated. Length 6.5 mm (male), 7.5 mm (female). Figs. 24, 24a. Sichuan.

Ch. amica Lopatin, 2009 (see also Subgroup 9)

10(1) Aedeagus with constriction on lateral sides.

11(12) Aedeagus with weak constriction at sides just before apex; with flagellum broad. Pronotal lateral impression very shallow. Head and elytra purplish violet with narrow green sutural stripe, pronotum green with purplish violet lateral calli. Length 8.0–8.3 mm. Species from Sichuan. Fig. 9.

Ch. purpureoviridis Lopatin, 2005b

12(11) Aedeagus with strong constriction laterally before apical orifice; with flagellum narrow, whip-shaped. Pronotal lateral impression broad, shallow along entire length. Dorsum green with purple pattern: diffuse spots on head, pronotal disc and lateral calli, elytral base, suture, lateral side, and 3 discal stripes. Length 7.6 mm (male). Female is unknown. Species from Gansu. Fig. 93.

Ch. sp. 45

Subgroup 23. Key to species.

1(2) Pronotal lateral impression moderately deep basally and apically; lateral impression shallow, wide at mid-length. Head and pronotum dark bronze with greenish tint, elytra dark coppery, dorsum dull, distinctly shagreen. Basal fold of prothoracic hypomeron distinct. Species from Gansu. Length 6.3 mm (male), female is unknown. Fig. 27.

Ch. volkovitshi Lopatin, 2009

2(1) Pronotal lateral impression wide, shallow, only slightly deepened apically and basally. Dorsum bronze, moderately or sericeous shining. Basal fold of prothoracic hypomeron absent. Species from Yunnan.

3(4) Aedeagus strongly flattened dorso-ventrally, moderately narrowed at sides of apical orifice. Length 5.5–6.8 mm. Fig. 61.

Ch. sp. 40

4(3) Aedeagus tube-shaped, moderately flattened dorso-ventrally, broadened at sides of apical orifice and then triangularly narrowed. Length 6.1–6.9 mm. (species belonging also to Subgroup 1). Figs. 94, 95.

Ch. *liqingzhaoae* Daccordi et Ge in: Daccordi, Ge, Cui, Yang, 2011

Subgroup 24.

This subgroup includes one species, *Ch*. sp. 46 from Gansu. Dorsum bronze. Aedeagus with large but not sharp apical denticles ventrally. Length 5.9–6.5 mm. Fig. 88.

Subgroup 25.

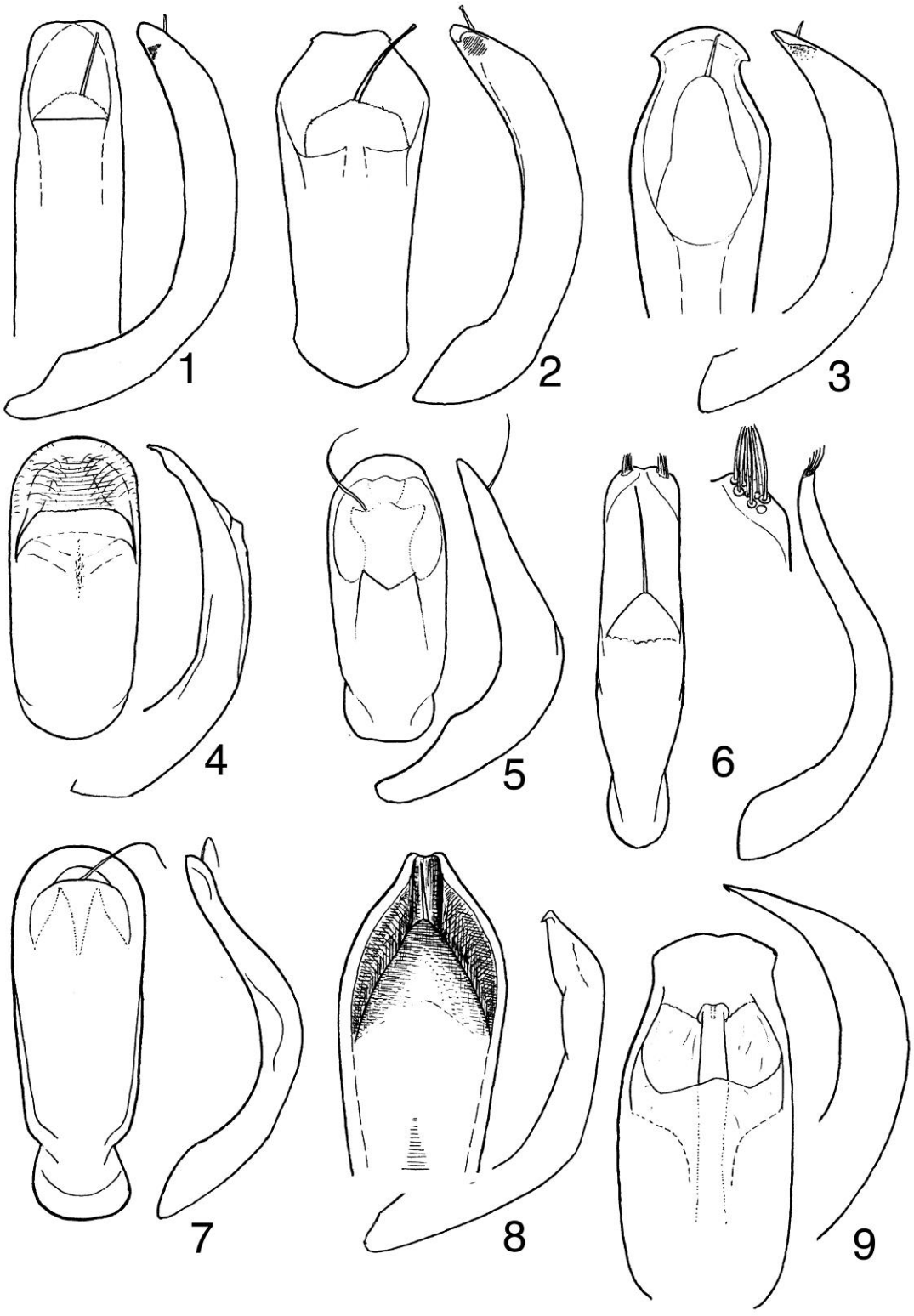
This subgroup includes one species, *Ch*. sp. 49 from Gansu. Dorsum sericeous, black with scarcely visible purple tint. Pronotal lateral impression broad, shallow, without large punctures. Pygidium with sharp furrow along entire length. Aedeagus narrow, flattened dorso-ventrally, strongly arc-shaped in lateral view, moderately narrowed at sides of apical orifice, with apical orifice very long, projecting. Length 5.4 mm (male), female is unknown. Fig. 89.

Subgroup 26.

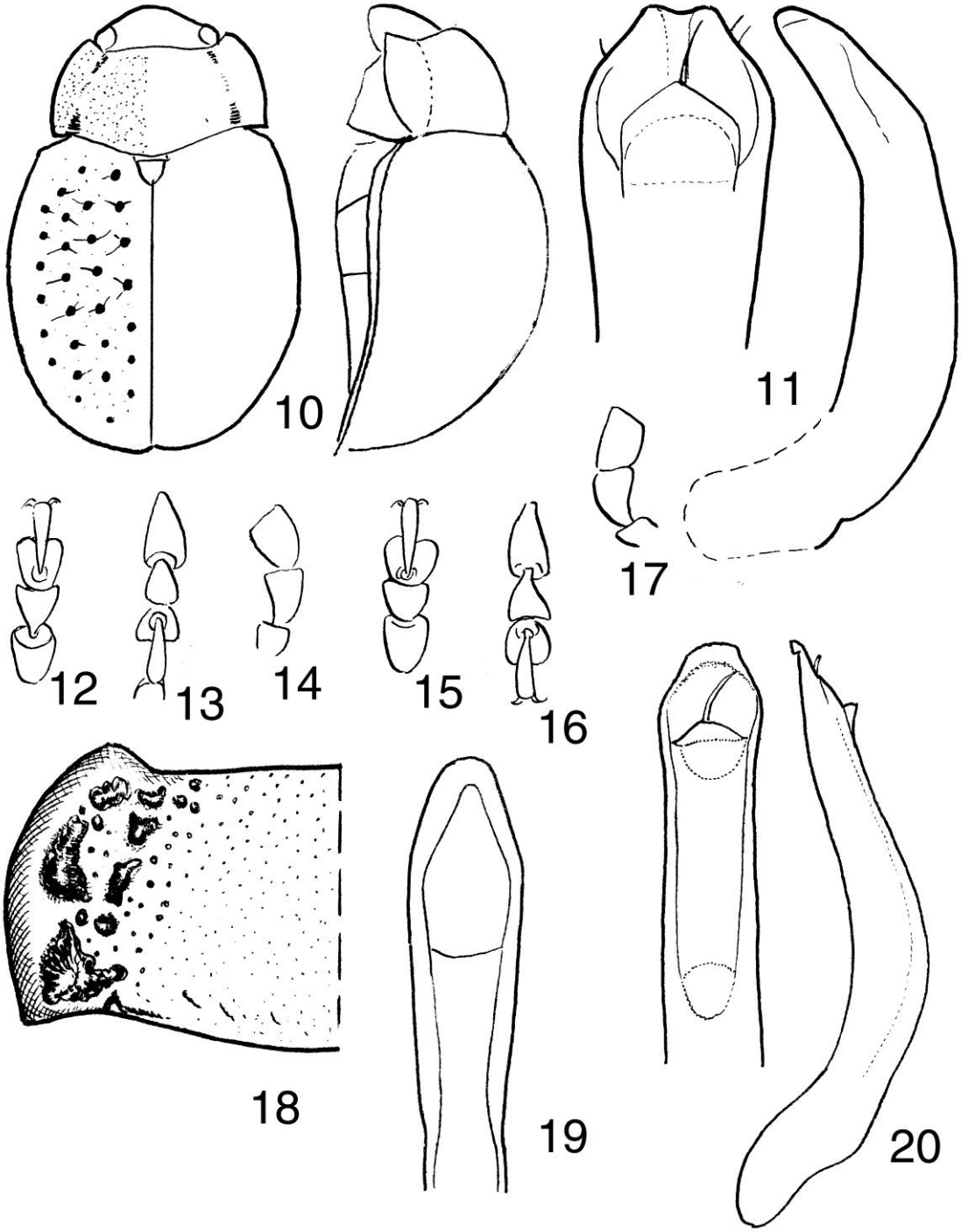
This subgroup includes one species, *Ch*. sp. 50 from Gansu. It is externally similar to the members of the subgenus *Medvedevlevna* and differs in last maxillary palpomere elongate oval, longer than wide. Also, it is similar to subgenus *Timarchomela* and differs in very broad male tarsomeres 1–3 and very weakly convex pronotal lateral callus (look like the respective in *Medvedevlevna*). Aedeagus straight in apical ⅔ (in lateral view), with apex elongate triangular, with transverse ledge near mid-length on ventral side. Length 7.7–8.3 mm (male), female is unknown. Fig. 90.

Subgroup 27.

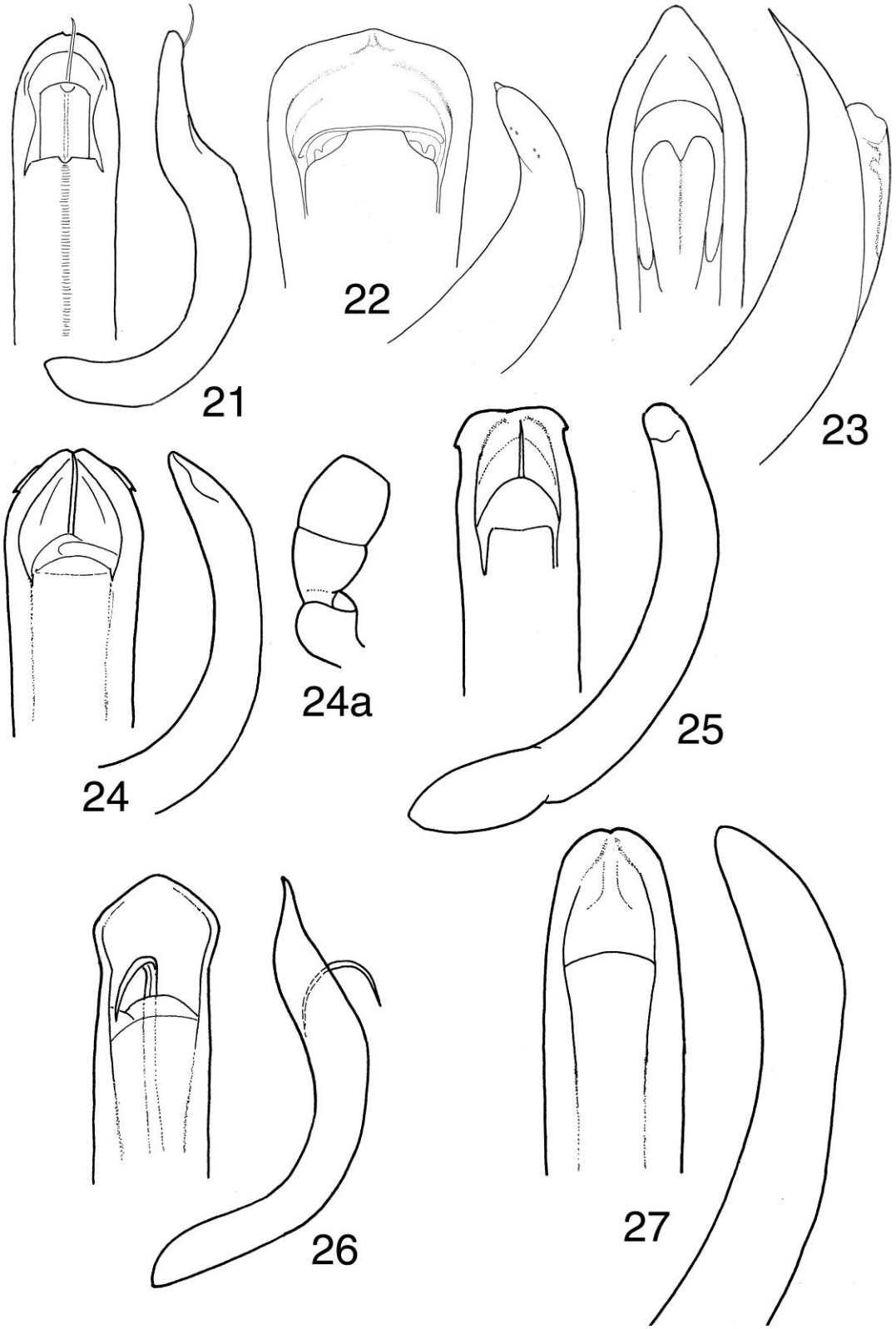
This subgroup includes one species, *Ch. zhangi* Ge et Daccordi in: Ge, Daccordi, Li, Yang, 2011b from Yunnan. Dorsum dark green. Elytral intervals covered by small and sparse punctures. Aedeagus narrow, hardly broadened at sides of apical orifice, this orifice is very long, covered in basal ½ with long triangular plate, with flagellum narrow, long, apex of aedeagus narrowly roundly truncate, with small apical denticles on underside. Length 5.8–6.2 mm. Figs. 84, 85, 99.



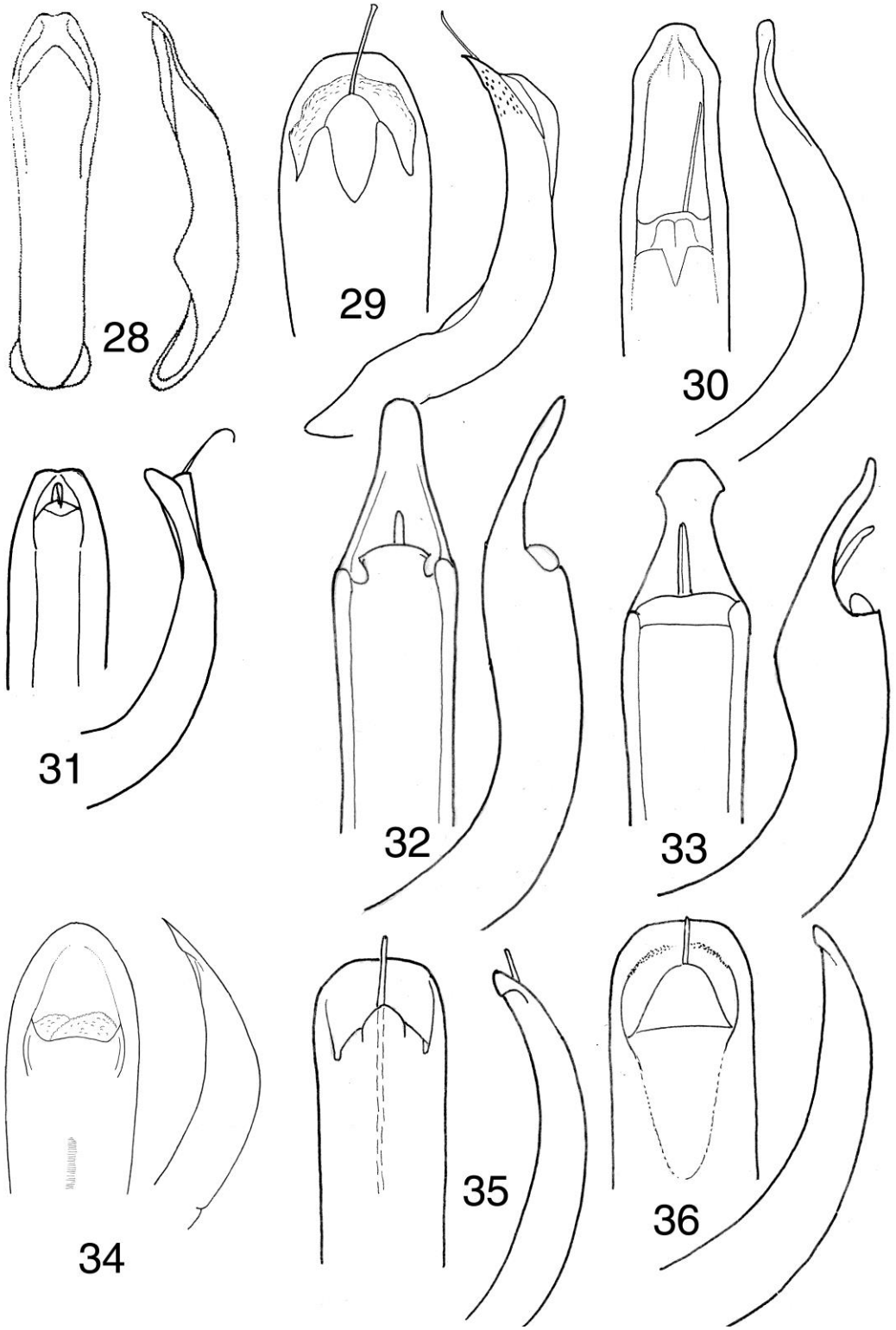
Ch. (***zhongdiana***) **species group figures 1–9**: Male, aedeagus, dorsal and lateral view: 1 – *Chrysolina claripes*, holotype (Sichuan), 2 – *Ch. jiangi*, paratype (Sichuan), 3 – *Ch. geae*, paratype (Sichuan), 4 – *Ch. infernalis*, paratype (Sichuan), 5 – *Ch. davidiani*, holotype (Sichuan), 6 – *Ch. sichuanica*, holotype (Sichuan), 7 – *Ch. rotundata*, holotype (Sichuan), 8 – *Ch. wangi*, holotype (Yunnan), 9 – *Ch. purpureoviridis*, holotype (Sichuan). (Orig.)



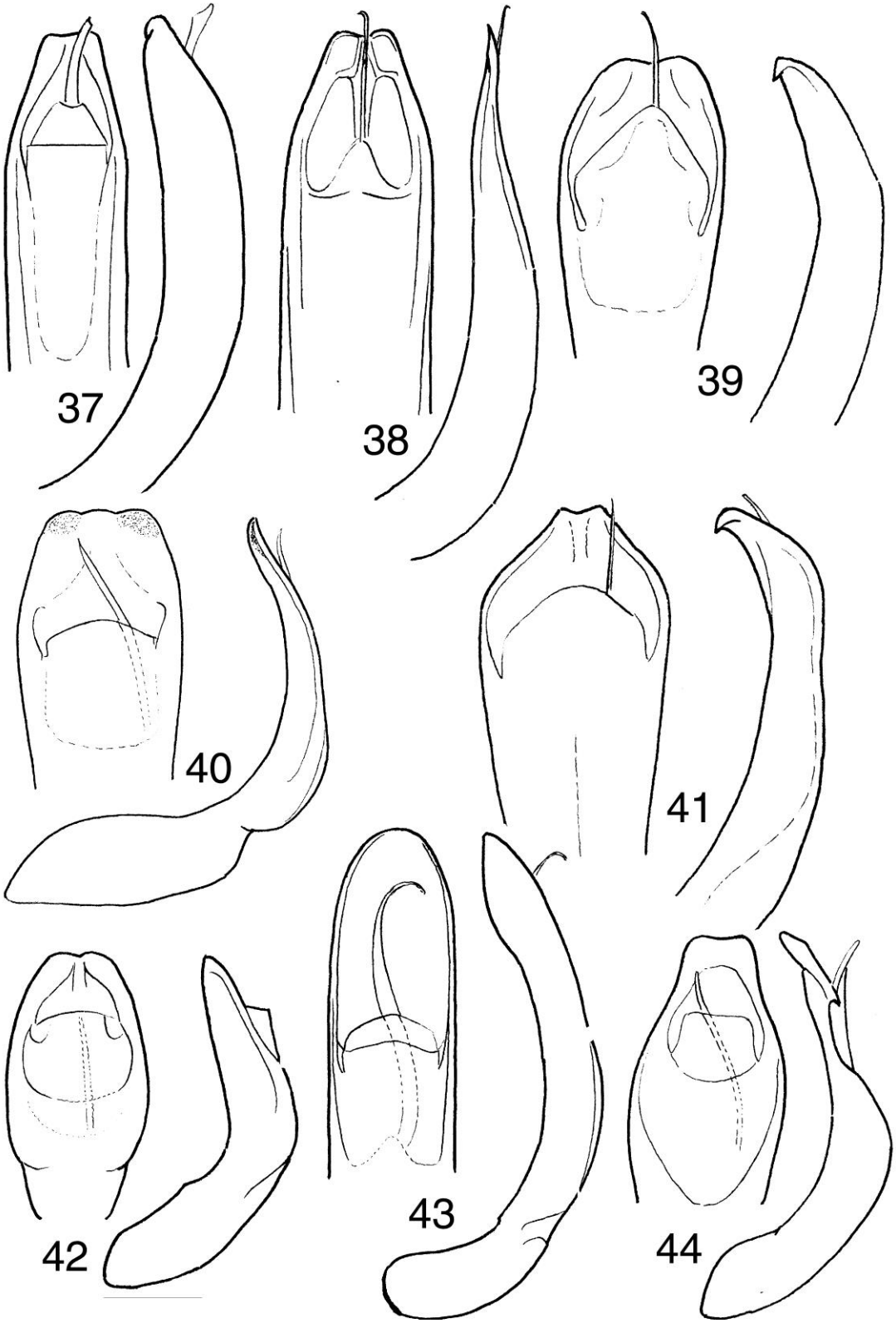
***Ch.* (*zhongdiana*) species group figures 10–20**: 10–17 – *Chrysolina fascinatrix* (Yunnan): 10–14 – male, holotype: 10 – total dorsal and lateral view, 11 – aedeagus, dorsal and lateral view, 12 – fore-tarsus, 13 – hind-tarsus, 14 – maxillary palpus; 15–17 – female, paratype: 15 – fore-tarsus, 16 – hind-tarsus, 17 – maxillary palpus; 18–19 – *Ch. zhongdiana*, male, paratype (Yunnan): 18 – pronotum, 19 – aedeagus, dorsal view; 20 – *Ch. kippenbergi*, male, paratype (Sichuan), aedeagus, dorsal and lateral view. (Orig.)



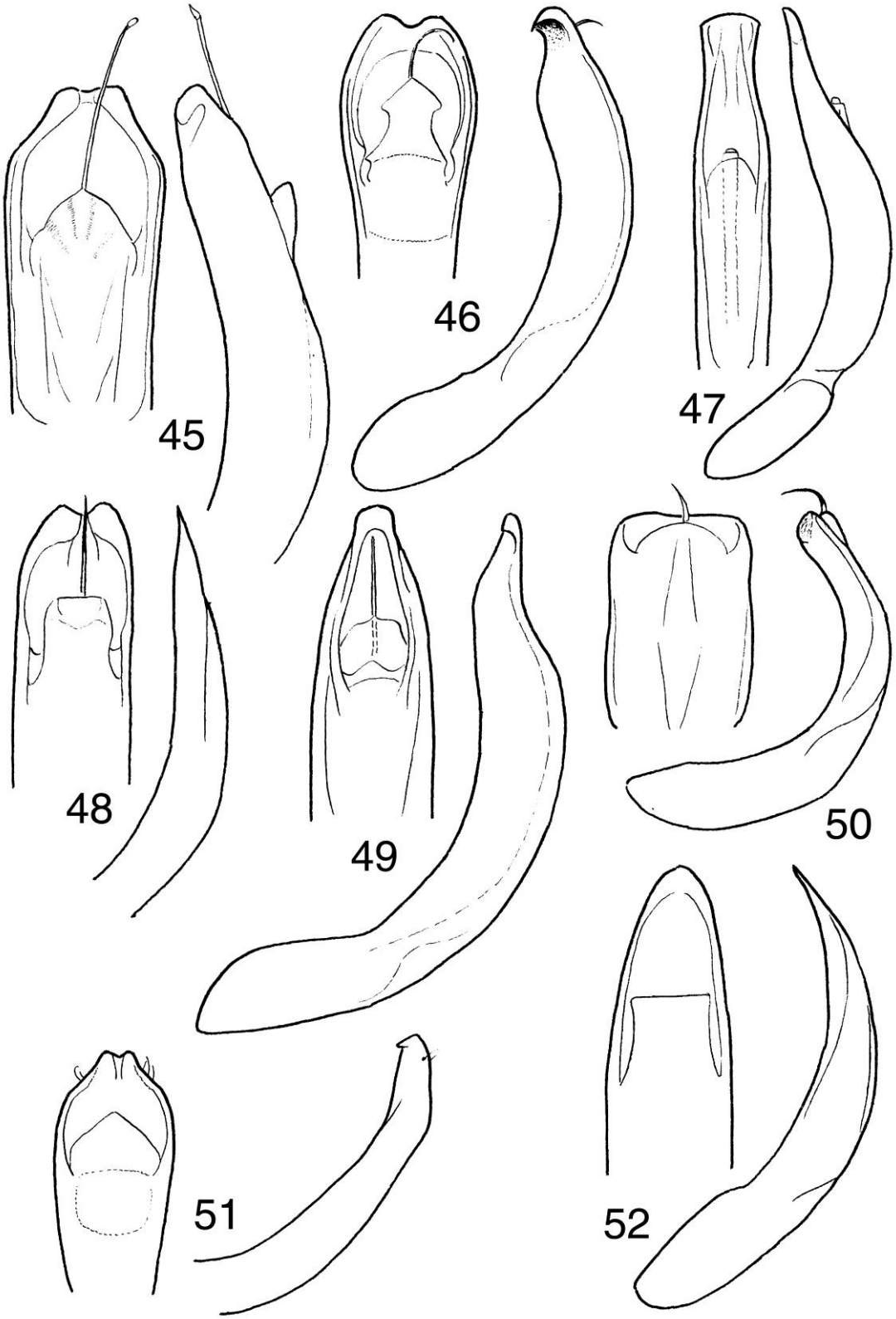
***Ch.* (*zhongdiana*) species group figures 21–27**: Male aedeagus, dorsal and lateral view: 21 – *Chrysolina songpana* (holotype, N Sichuan), 22 – *Ch. nesterovae* (holotype, Sichuan), 23 – *Ch. matruelis* (holotype, S Sichuan), 24 – *Ch. amica* (holotype, Sichuan) (24a – maxillary palpus), 25 – *Ch. baimana* (holotype, Sichuan), 26 – *Ch. korotjaevi* (holotype, Sichuan), 27 – *Ch. volkovitshi* (holotype, Gansu). (Orig.)



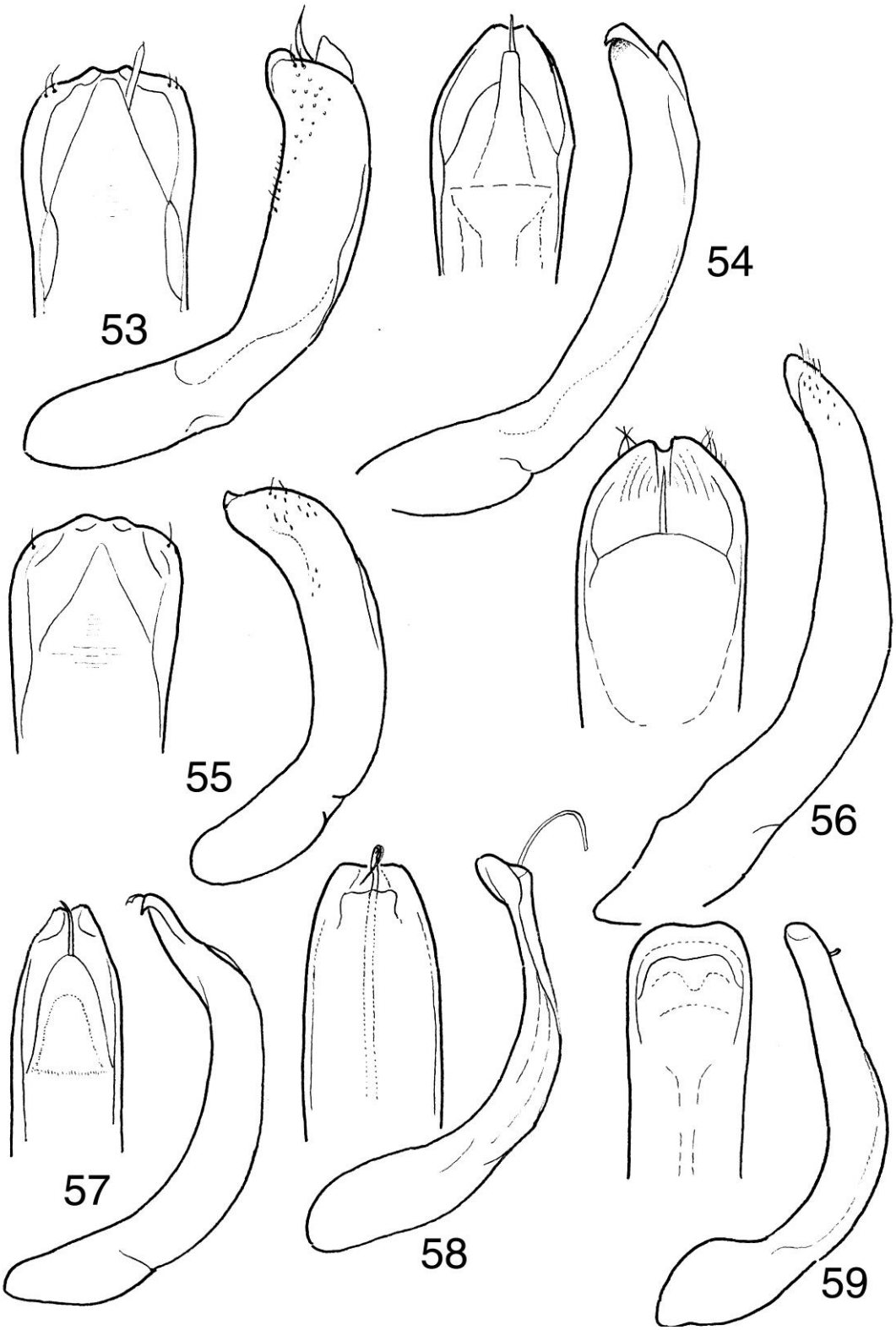
Ch. (***zhongdiana***) **species group figures 28–36**: Male aedeagus, dorsal and lateral view: 28 – *Chrysolina zhongdiana* (*Ch. sinica*, holotype, Sichuan / Yunnan), 29 – *Ch. yunnana* (holotype, Yunnan), 30 – *Ch. nixiana* (holotype, Yunnan), 31 – *Ch. pingchuana* (holotype, Sichuan), 32 – *Ch. wangboi* (paratype, Sichuan), 33 – *Ch. boccaccioi* (holotype, Sichuan), 34 – *Ch. sicieni* (paratype, Sichuan), 35 – *Ch. jinxiaoae* (paratype, Sichuan), 36 – *Ch. libaii* (paratype, Sichuan). (After: Lopatin, 2008: 28; others – orig.)



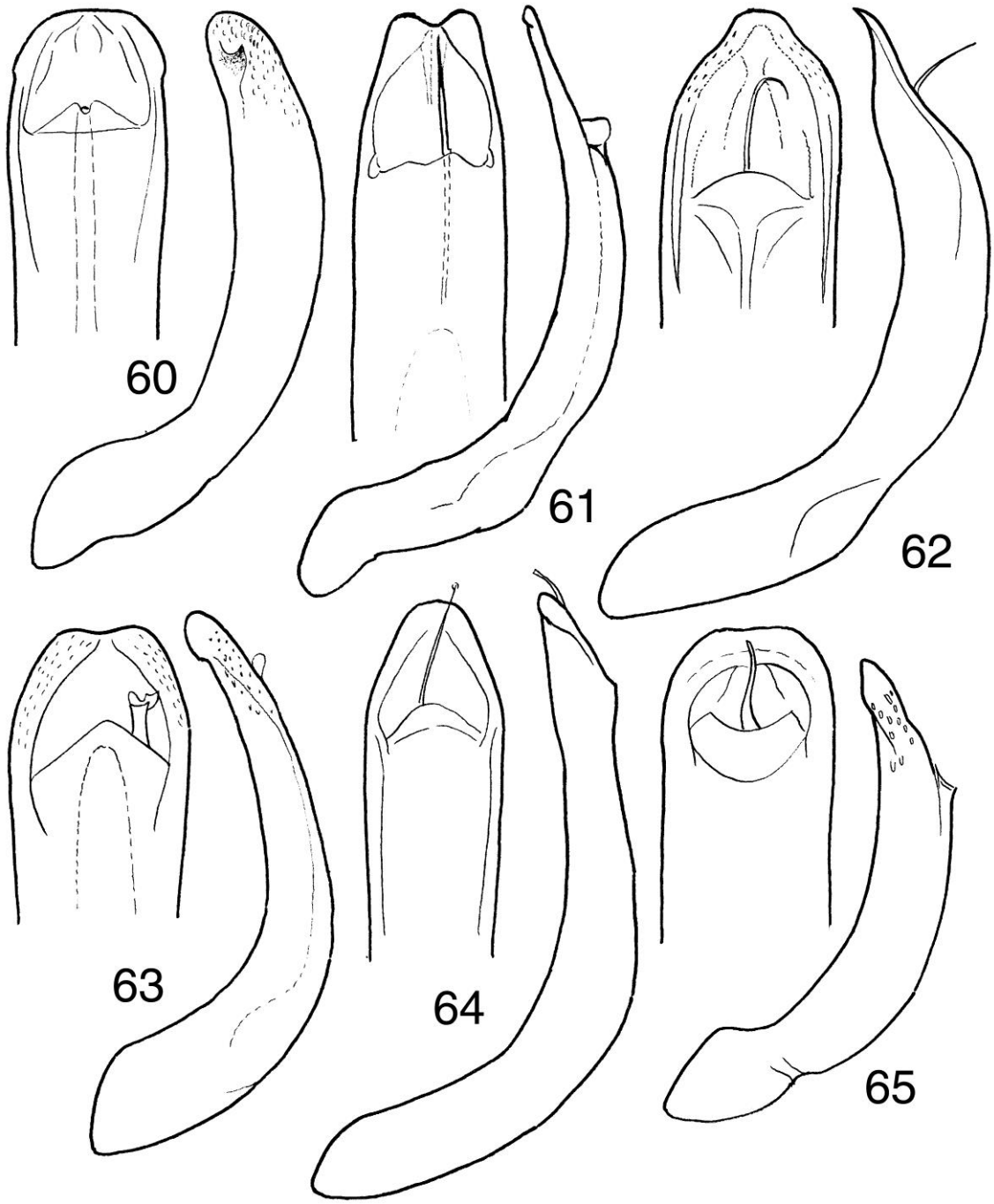
Ch. **(*zhongdiana*) species group figures 37–44**: Male aedeagus, dorsal and lateral view: 37 – *Chrysolina* sp. 16 (Sichuan), 38 – *Ch.* sp. 17 (Yunnan), 39 – *Ch.* sp. 18 (Yunnan), 40 – *Ch.* sp. 19 (Yunnan), 41 – *Ch.* sp. 20 (Yunnan), 42 – *Ch.* sp. 35 (Yunnan), 43 – *Ch.* (*Pezocrosita*) (*brevilata*) group sp. 3 (Sichuan), 44 – *Ch.* sp. 4 (Yunnan). (Orig.)



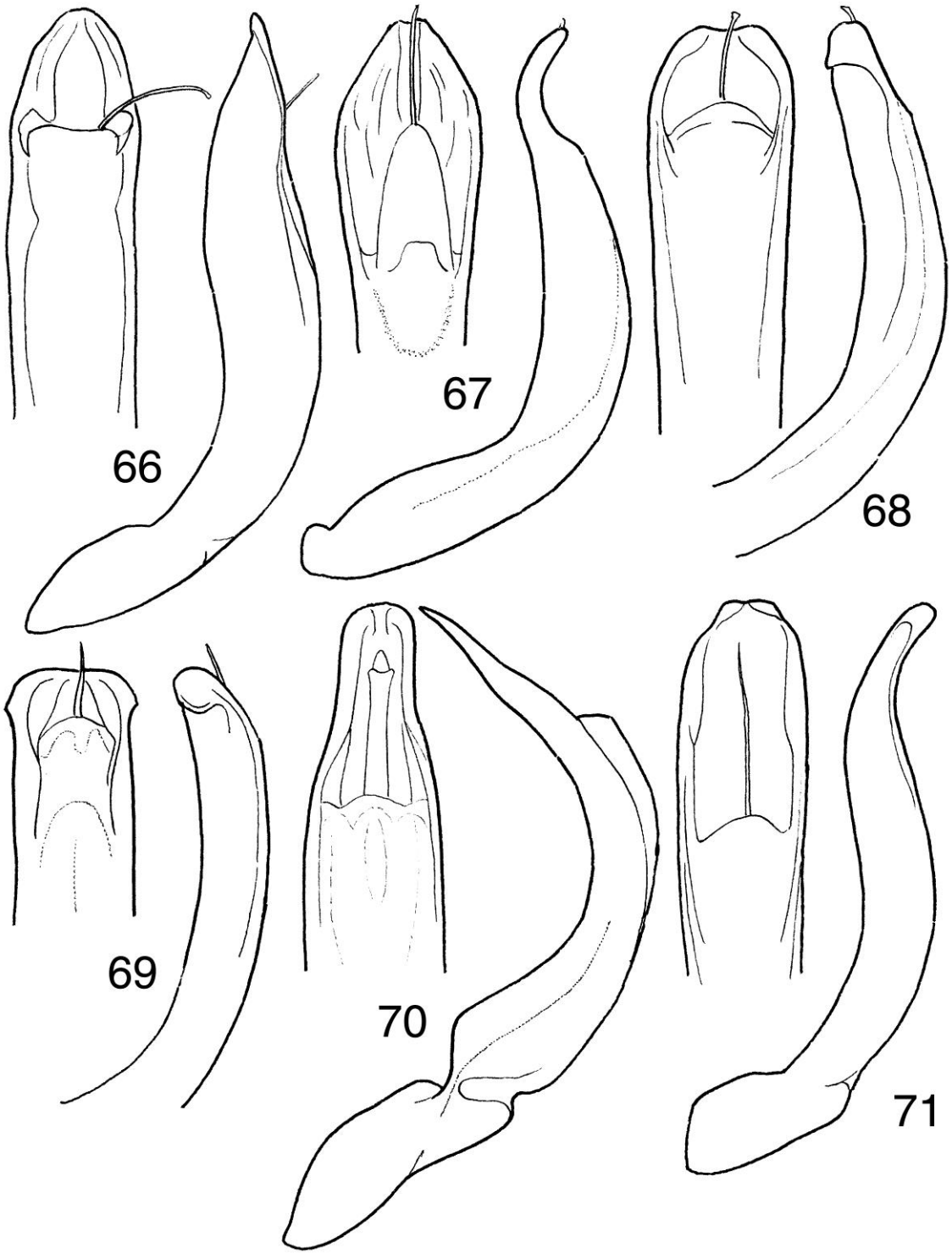
Ch. **(*zhongdiana*) species group figures 45–52**: Male aedeagus, dorsal and lateral view: 45 – *Chrysolina* sp. 1 (Yunnan), 46 – *Ch*. sp. 2 (Yunnan), 47 – *Ch*. sp. 38 (Sichuan), 48 – *Ch*. sp. 36 (Yunnan), 49– *Ch*. sp. 39 (Yunnan), 50 – *Ch*. sp. 37 (Yunnan), 51 – *Ch*. sp. 24 (Yunnan), 52 – *Ch*. sp. 34 (Sichuan). (Orig.)



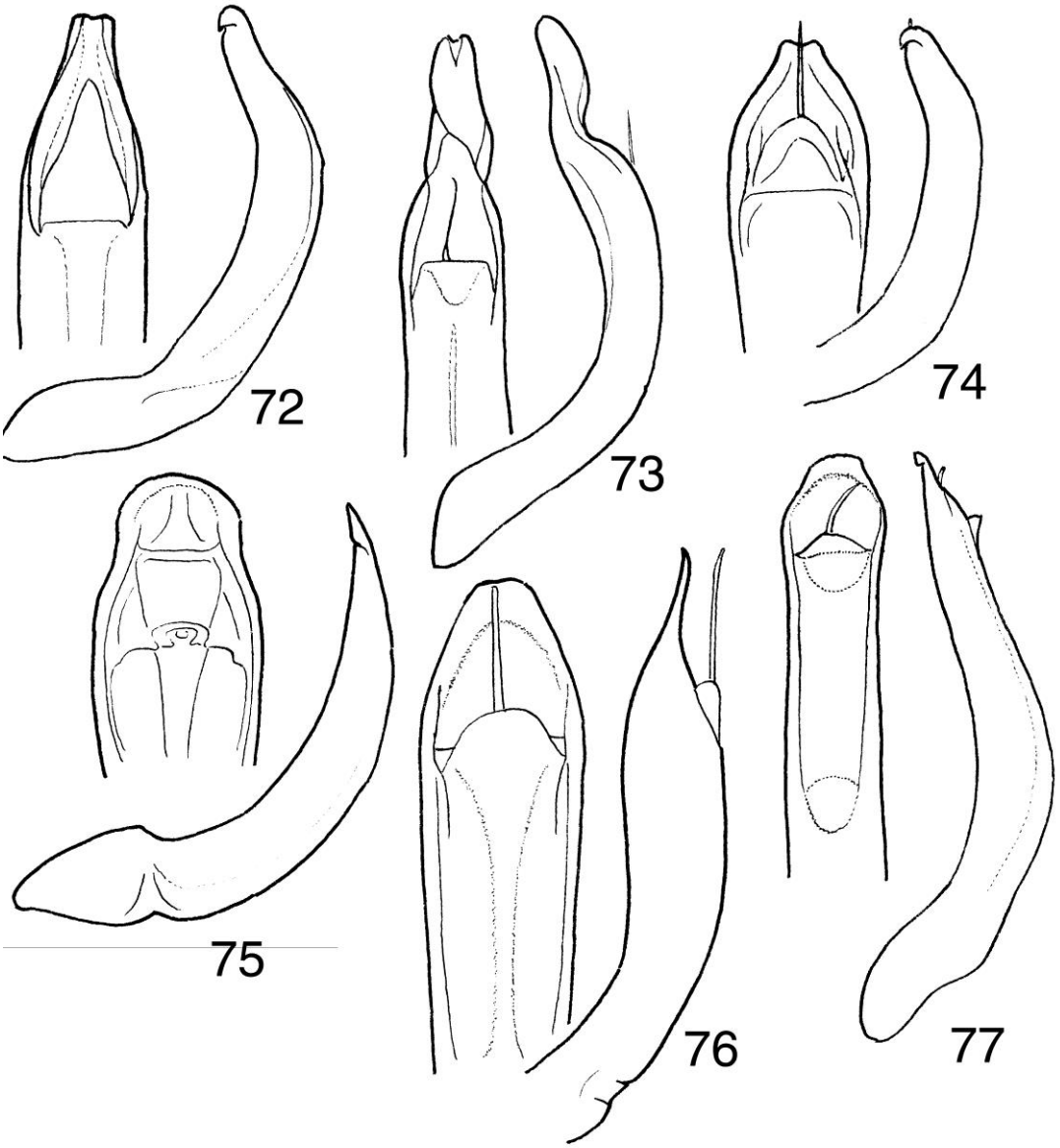
Ch. (***zhongdiana***) **species group figures 53–59**: Male aedeagus, dorsal and lateral view: 53 – *Chrysolina* sp. 21 (Yunnan), 54 – *Ch*. sp. 22 (Yunnan), 55 – *Ch*. sp. 25 (Yunnan), 56 – *Ch*. sp. 26 (Sichuan), 57– *Ch*. sp. 23 (Yunnan), 58 – *Ch*. *pingchuana* (Sichuan), 59 – *Ch*. sp. 29 (Yunnan). (Orig.)



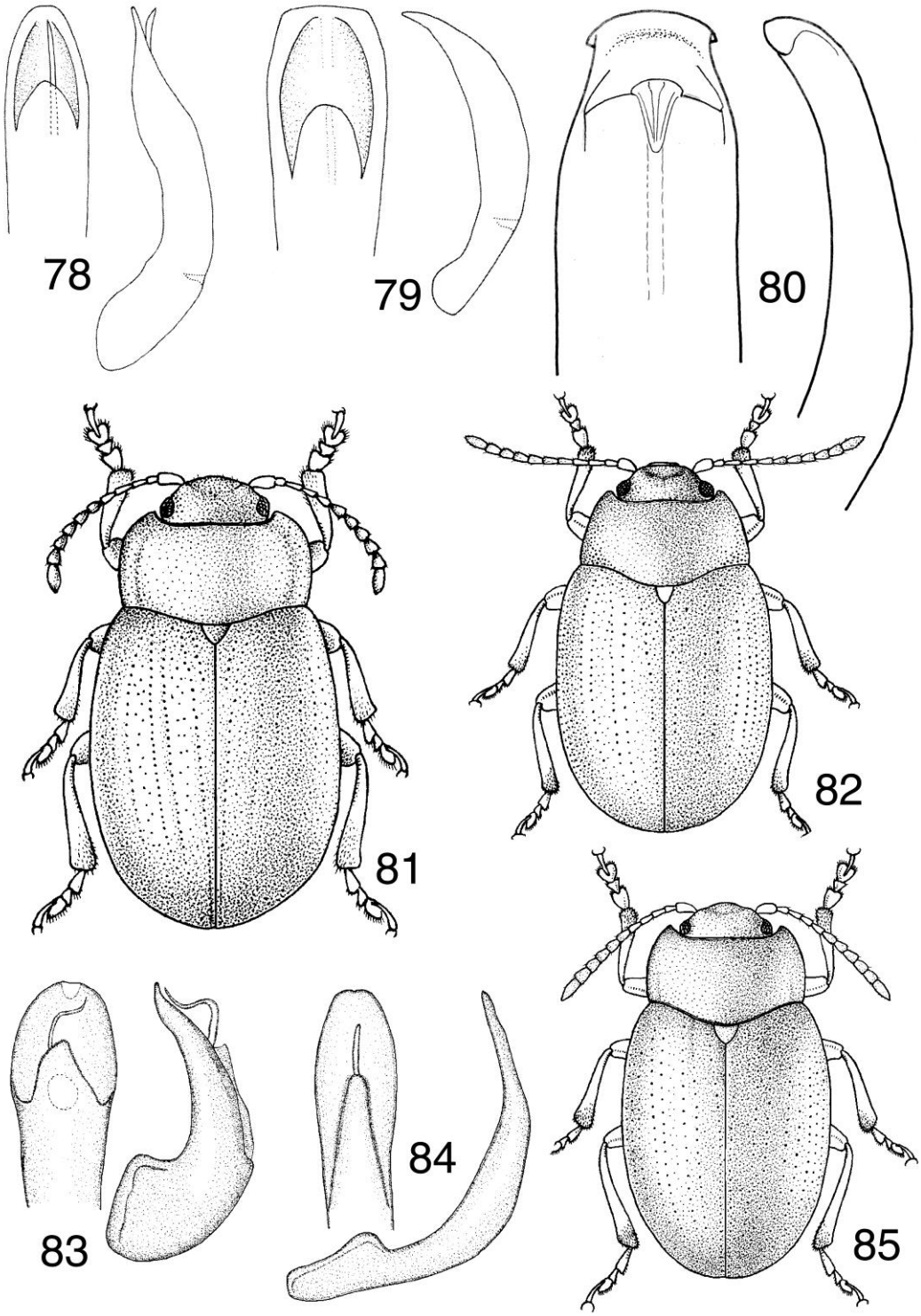
Ch. (***zhongdiana***) **species group figures 60–65**: Male aedeagus, dorsal and lateral view: 60 – *Chrysolina* sp. 28 (Sichuan), 61 – *Ch*. sp. 40 (Yunnan), 62 – *Ch*. sp. 30 (Yunnan), 63 – *Ch*. sp. 31 (Yunnan), 64 – *Ch*. sp. 33 (Yunnan), 65 – *Ch*. sp. 32 (Sichuan). (Orig.)



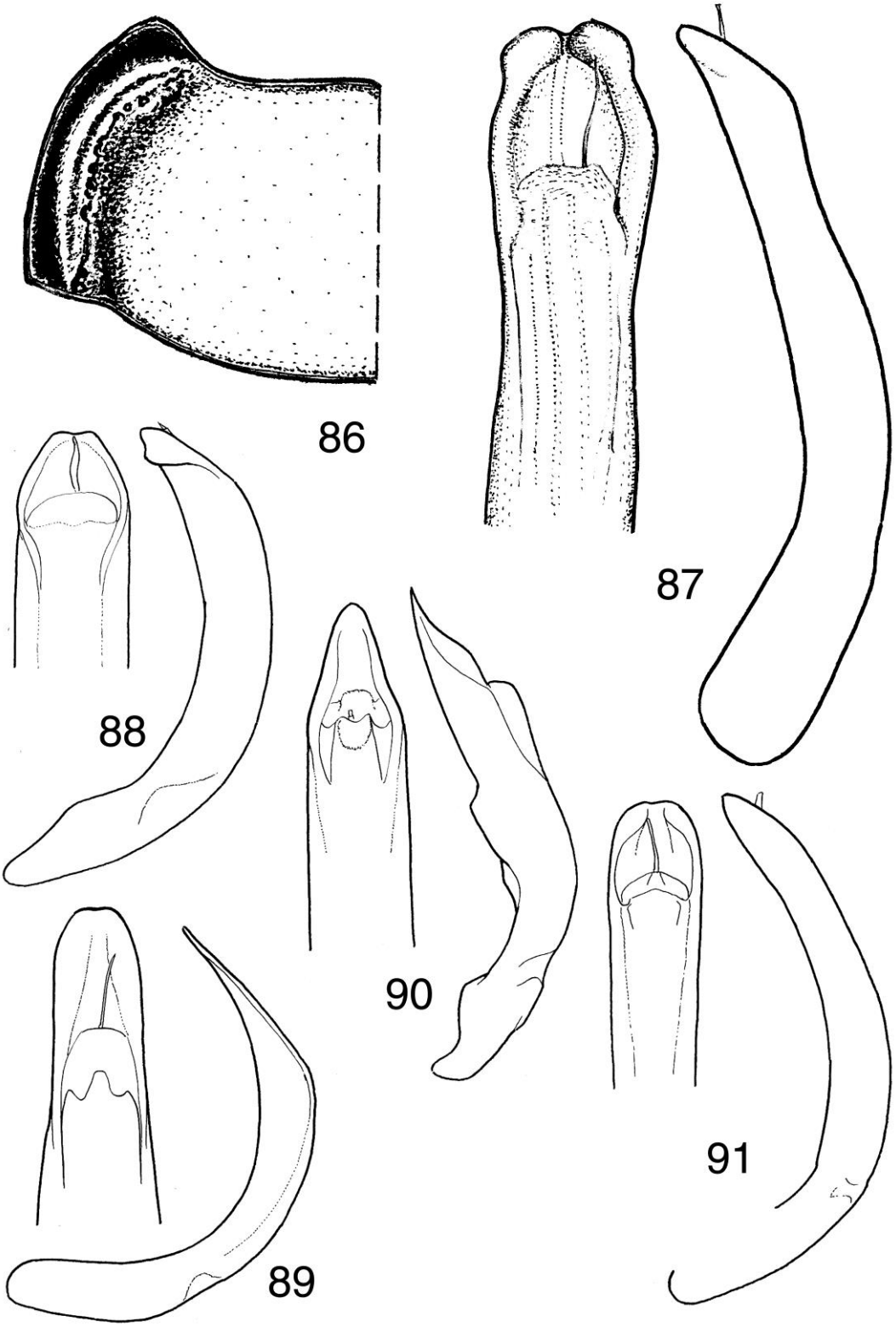
Ch. (***zhongdiana***) **species group figures 66–71**: Male aedeagus, dorsal and lateral view: 66 – *Chrysolina* sp. 12 (Sichuan), 67 – *Ch*. sp. 13 (Sichuan), 68 – *Ch*. sp. 14 (Sichuan), 69 – *Ch. baimana* (Sichuan), 70 – *Ch*. sp. 5 (Sichuan), 71 – *Ch*. sp. 9 (Yunnan). (Orig.)



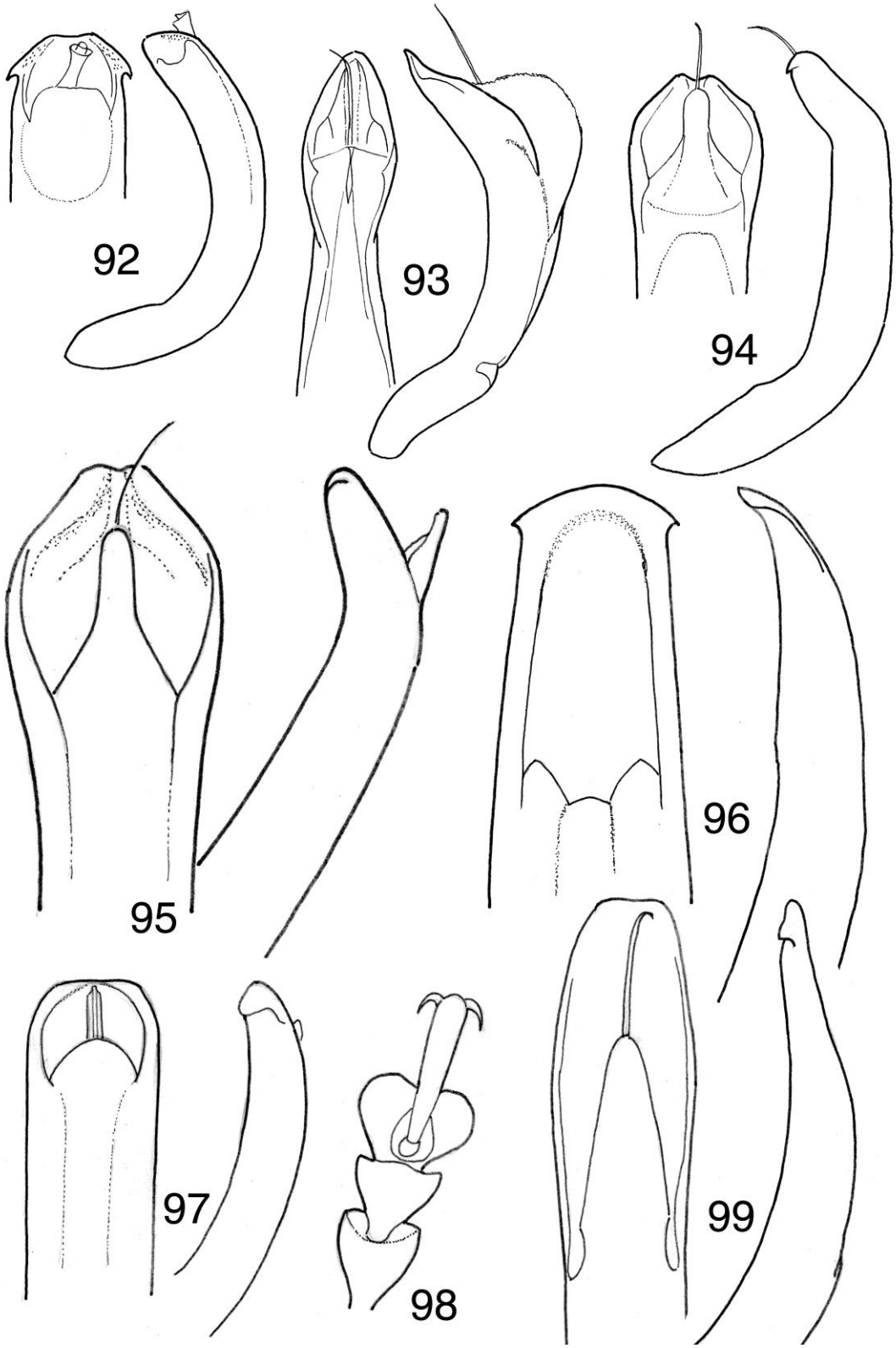
Ch. (***zhongdiana***) **species group figures 72–77**: Male aedeagus, dorsal and lateral view: 72 – *Chrysolina* sp. 6 (Yunnan), 73 – *Ch*. sp. 8 (Sichuan), 74 – *Ch*. sp. 10 (Sichuan), 75 – *Ch*. sp. 11 (Sichuan), 76 – *Ch*. sp. 41 (Sichuan), 77 – *Ch. kippenbergi*, paratype (Sichuan). (Orig.)



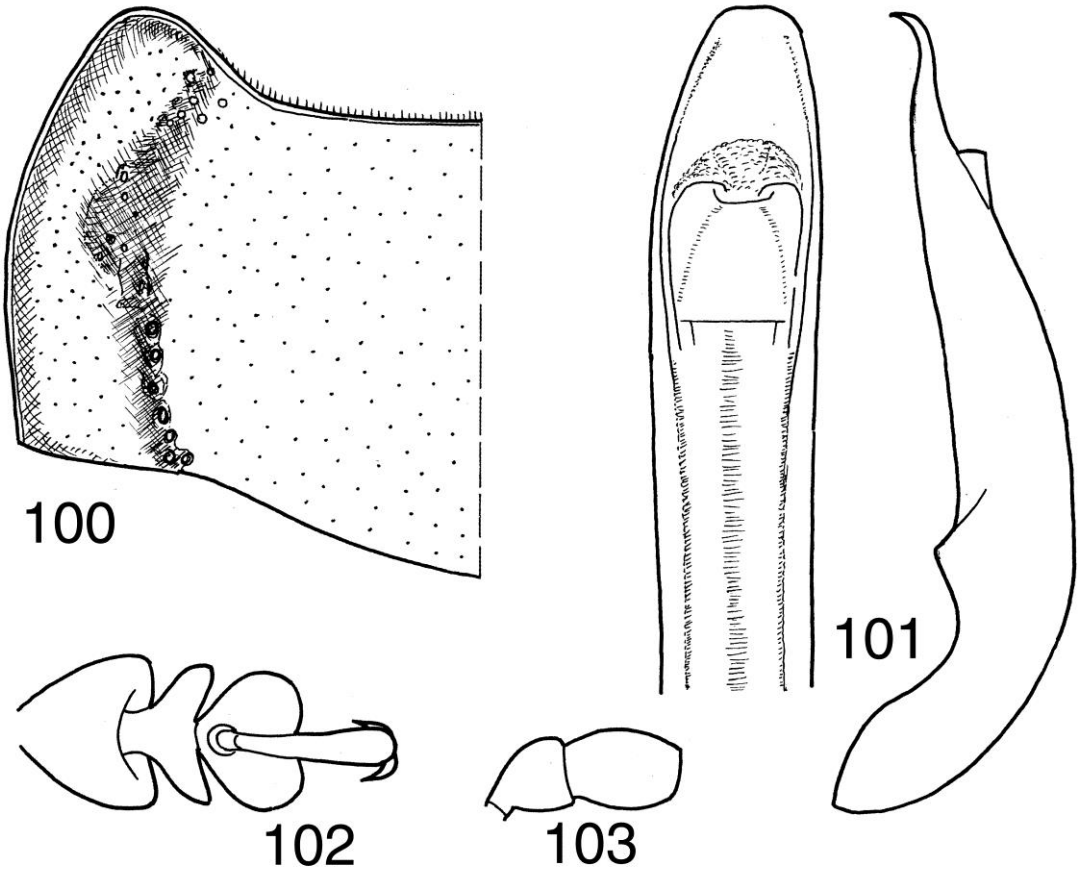
***Ch.* (*zhongdiana*) species group figures 78–85**: 78 – *Chrysolina luobinwangi*, aedeagus, dorsal and lateral view; 79 – *Ch. luyoui*, aedeagus, dorsal and lateral view; 80–81 – *Ch. hongyuanensis*: 80 – male (paratype, Sichuan), aedeagus, dorsal and lateral view, 81 – total dorsal view; 82–83 – *Ch. shuyongi*: 82 – total dorsal view, 83 – aedeagus, dorsal and lateral view; 84–85 – *Ch. zhangi*: 84 – aedeagus, dorsal and lateral view, 85 – total dorsal view. (After: Daccordi, et al., 2011: 78–79; Ge, et al., 2011: 81–85; orig.: 80)



Ch. (***zhongdiana***) **species group figures 86–91**: 86 – *Chrysolina mirabilis*, female (Sichuan), pronotum; 87–91 – aedeagus, dorsal and lateral view: 87 – *Ch. foveopunctata*, male (syntype, Yunnan), 88 – *Ch*. sp 46 (Gansu), 89 – *Ch*. sp. 49 (Gansu), 90 – *Ch*. sp. 50 (Gansu), 91 – *Ch*. sp. 44 (Gansu). (Orig.)



Ch. (***zhongdiana***) **species group figures 92–99:** 92–96 **–** aedeagus, dorsal and lateral view: 92 – *Chrysolina viridiopaca* (Sichuan), 93 – *Ch.* sp. 45 (Gansu), 94–95 – *Ch. liqingzhaoae*: 94 – non-type specimen (Yunnan), 95 – paratype (Yunnan), 96 – *Ch. mirabilis* (Sichuan); 97–98 – *Ch. lijieae*, male (paratype, Sichuan): 97 – aedeagus, dorsal and lateral view, 98 – fore-tarsus; 99 – *Ch. zhangi* (paratype, Yunnan), aedeagus, dorsal and lateral view. (Orig.)



Ch. (***zhongdiana***) **species group figures 100–103:** *Chrysolina zhongdiana* male (holotype *Ch. sinica,* Sichuan / Yunnan): 100 – pronotum, 101 – aedeagus, dorsal and lateral view, 102 – foretarsus, 103 – maxillary palpus. (Orig.)

Species *incertae sedis*

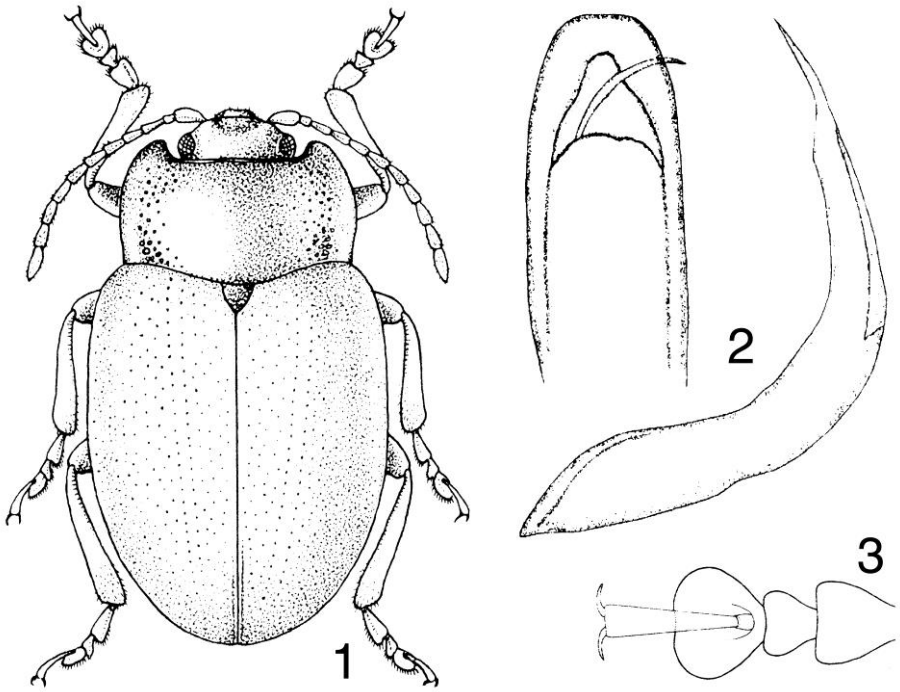
I did not have the opportunity to study any material on some species or studied only female specimens. According to the original descriptions and the characters of available specimens, I believe these taxa to be the members of the genus *Chrysolina*. However, the original descriptions or female specimens of these taxa do not contain some important diagnostic features. Therefore, I can not attribute these species with certainty to any of the subgenera or unnamed species groups of subgeneral rank.

Species from S-W China (Xizang)

Chrysolina cuiae Ge et Daccordi, 2011

The present diagnosis is based on the original description (Ge, Daccordi in Ge et al., 2011) and includes only important diagnostic features.

Body metallic bronze, five basal antennomeres reddish brown. Length 8.0 mm (male), female unknown. Body elongate-ovoid, convex in lateral view. Hind wings absent. Antennal insertion 2.4 X closer to clypeus than to eye. 4th maxillary palpomere longer than 3rd one, truncate apically. Pronotum without anterior setiferous pores. Disc with sparse and very small punctures, similar to those on head, but anterior and posterior parts with some scattered moderate punctures. Pronotum without lateral callus, with dense punctures in depression near lateral side. Elytron with punctures forming irregular single striae, sutural stria present, punctures smaller than those on side of pronotum; interspaces of elytral striae convex, with sparse and small punctures. Epipleuron ciliate in apical ⅓. Tarsomere 1 of male fore-tarsus enlarged, hind-tarsomeres 1–3 entirely pubescent beneath. Claw tarsomere without denticles. Intercoxal prosternal process with sparse and moderate punctures, truncate behind, not emarginated behind. Pygidium without longitudinal depression medially. Aedeagus in basal part slightly wider than apex, curved in lateral view, flagellum slender.
Remark. The original description does not include the following 9 subgeneral features (see above, Chapter 1. Morphology and Taxonomy): numbers 5, 6, 8–10, 13, 15, 18, 20. Species was described on the base of one male.

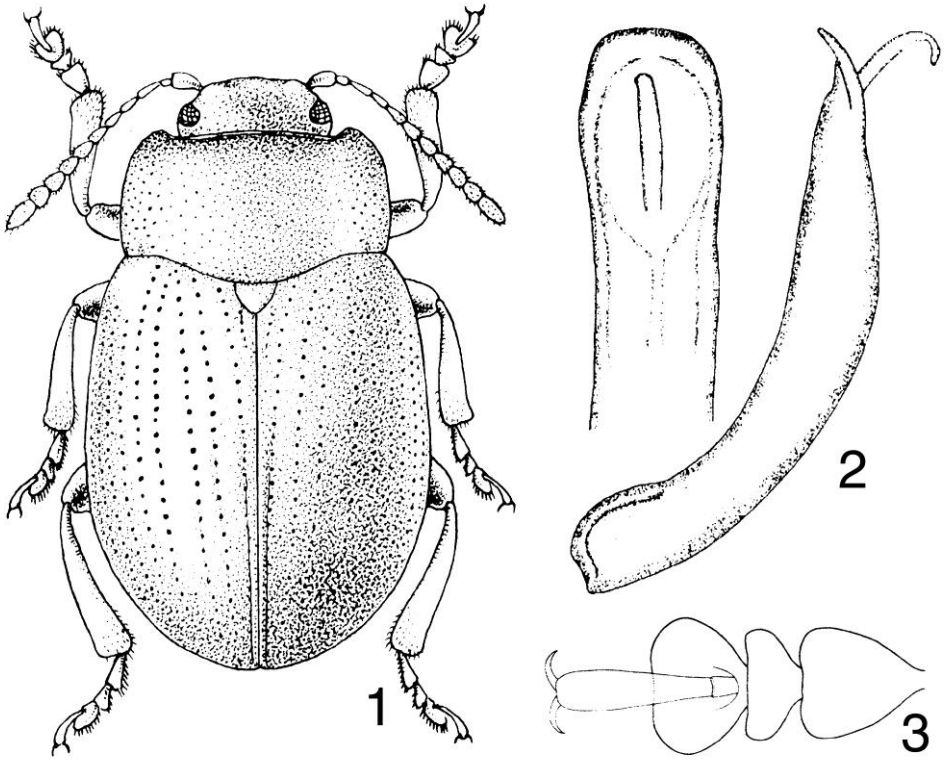


***Ch. cuiae* figures 1–3:** male, holotype (China: Xizang): 1 – total dorsal view, 2 – aedeagus, dorsal and lateral view, 3 – tarsus. (After: Ge, et al., 2011: 1–3)

Chrysolina gyacaensis Daccordi et Yang, 2011

The present diagnosis is based on the original description (Daccordi, Yang in Ge et al., 2011) and includes only important diagnostic features.

Body bronze with metallic purple. Length 5.5 mm (male), female unknown. Body elongate-ovoid, convex in lateral view. Hind wings absent. Antennal insertion 2.4 X closer to clypeus than to eye. 4th maxillary palpomere longer than 3rd one, truncate apically. Pronotum without anterior setiferous pores. Pronotal disc with moderate and sparse punctures similar to those on head. Pronotum with lateral callus separated by shallow punctured depression only at basal part, with dense punctures near basal lateral side. Elytron with punctures forming 9 irregular single striae, sutural stria present, punctures larger than those of side of pronotum; interspaces of elytral striae with very fine sparse punctures, with transverse wrinkles especially in basal part. Elytral epipleura horizontal, with only 3 setae. Pygidium without longitudinal depression medially. Male fore-tarsomere 1 enlarged, hind-tarsomeres 1–3 entirely pubescent beneath. 4th tarsomere without denticles. Prothoracic hypomeron smooth, intercoxal process with dense and moderate punctures, truncate and not emarginated behind. Last abdominal sternite in male without emargination. Basal part of aedeagus as wide as apex; aedeagus curved in lateral view; flagellum slender.
Remark. The original description does not include the following 8 subgeneral features (see above, Chapter 1. Morphology and Taxonomy): numbers 5, 6, 8–10, 13, 15, 18. Species was described on the base of one male.



***Ch. gyacaensis* figures 1–3:** male, holotype (China: Xizang): 1 – total dorsal view, 2 – aedeagus, dorsal and lateral view, 3 – tarsus. (After: Ge, et al., 2011: 1–3)

Species from S China (Guangxi)

***Chrysolina taibaica* Chen, 1961**

"Apterous, blackish cupreous, underside deep bluish, the posterior margin of the four anterior abdominal sternites and antennae entirely red-brown. Apical segments of maxillary palpi slightly longer than broad, narrower but equals in length to the preceding. Pronotum very finely and closely punctate, interspaces mixed with still finer, microscopic punctures; lateral callus slightly convex, sides almost straight, only weakly convex in the middle. Elytra finely punctate, the disc with nine and half rows which are not very regular and somewhat arranged in pairs, interspaces covered with minute punctures. Proepimera not keeled. First and third segments of anterior tarsi almost equal in length. Last sternite bisinuate at apex. Distinguished by the antennae entirely dark rufous, the wings not developed and the elytral puncturation rather fine, with the rows not very regularly arranged. Length, 6.5 mm.; breadth, 4.3 mm" (Chen, 1961).

Remark. The original description does not include the following 14 subgeneral features (see above, Chapter 1. Morphology and Taxonomy): numbers 3, 5–7, 9–11, 13, 14, 16–19, 21. Species was described on the base of one male. Holotype was examined by Yang (2014), but aedeagus was not studied.

Species from Nepal

***Chrysolina tangalaensis* Kimoto, 2001**

The present diagnosis is based on the original description (Kimoto, 2001), reexamination of the holotype by Mikhailov (2019), by photos, and includes only important diagnostic features.

Male. Body convex, oblong oval; elytron with humerus not raised. Pronotum greenish, elytra dark bronze. Antenna robust, short, nearly exceeding base of pronotum. Antennomeres 5–11 thickened, 10th antennomere slightly wider than long. Pronotum nearly 1¾ X as wide as long, sides rounded, widest almost at base and narrowed anteriorly. Pronotum convex from side to side, finely granulate, uniformly covered with fine punctures and with a pair of short oblique lateral depressions which are starting from basal margin. Elytron as broad as pronotal base; surface finely granulate, and moderately large punctures arranged in 11 longitudinal, very dense rows; intervals slightly convex; punctures in rows placed at different distances, rows partly deepened, furrow shaped here and there. Tarsomeres 1–3 strongly broadened. Length 9.2–9.5 mm. Female unknown. This species resembles *Ch. dohertyi*, but differs in having the antenna more robust and in preapical segments slightly wider than long, and elytral punctures arranged in 11 rows, these rows slightly irregular. It differs from *Ch. dhaulagirica* in having the elytron entirely dark bronze.

Remark. The original description does not include the following 17 subgeneral features (see above, Chapter 1. Morphology and Taxonomy): numbers 2, 3, 5–10, 13–21.

***Chrysolina tangalaensis* figures:** male, holotype (E Nepal), dorsal and lateral view. (Photo by Ako Tachi, firstly published by Mikhailov, 2019)

Species from Pakistan

***Chrysolina kamali* Abdullah et Qureshi, 1969**

"Body oblong ovate, convex. Colour violet mixed with green. Head broad, sparsely but distinctly punctate, punctures on the clypeus finer than the vertex, the latter depressed. Antenna slender, less than half the length of the beetle, the five basal segments shining, the last six slightly thickened and opaque; first segment thickened, second smallest, almost half the length of the third which is longest, fourth and fifth almost equal to each other, the rest of the segments equal to each other, the last being a little more elongate and pointed. Prothorax a little broader than long, front margin shallowly emarginate, the sides convex from base to apex, basal margin as a whole slightly sinuate, anterior angles rounded, posterior obtuse; surface convex from side to side, uniformly and more or less closely punctate with the same kind of punctures throughout; each side has a longitudinal prominently concave raised strip which is bounded internally by a deep, sharp channel. Scutellum triangular, small, with surface punctate. Elytra broader at the base than the prothorax, basal margin thickened; the punctures on the elytra are not arranged in rows but have tendency to form rows. Abdomen sparsely punctate. Length, 9–10 mm; breadth 4–5 mm." (Abdullah, Qureshi, 1969)

Remark. The original description does not include the following 16 subgeneral features (see above, Chapter 1. Morphology and Taxonomy): numbers 2, 3, 5–10, 13, 15–21.

Species from S-W Africa

***Chrysolina corrugata* (Péringuey, 1892)**

"Long. 9, lat. 6 mm. Briefly ovate, coppery-fuscous, moderately shining; head rugose, prothorax with the lateral angles nearly straight, deeply punctured in the centre of the disc, with the outer sides deeply pitted, and the interstices corrugated; elytra convex, a little elongated, deeply and irregularly punctured in the dorsal part, with the outer sides from the base to the middle almost foveated and the interstals between the foveae sinuated and raised; legs coppery black and shining." (Péringuey, 1892)

Remark. The original description does not include the following 17 subgeneral features (see above, Chapter 1. Morphology and Taxonomy): numbers 2, 3, 5–10, 13–21.

Species from N Africa

***Chrysolina postviolacea* (Marseul, 1887)**

The present diagnosis is based on the original description (Marseul, 1887) and includes only important diagnostic features.

Length 8 mm, width 5 mm. Body elongate oval, convex, shining, metallic bluish violet ventrally, black with apical margin violet dorsally. Labrum red. Last segment of maxillary palpus short, truncate. Antennae reaching humerae. Pronotum marginated except basal side; slightly convex, covered by irregular sparse punctures. Pronotal lateral sides strongly roundly broadened anteriorly, and straight, convergent to the base posteriorly. Pronotal lateral sides covered by broad stripe of large sparse punctures forming 3–4 transverse rows, without lateral impressions. Elytra broader basally than pronotal base, with convex humeral calli, without sutural stria at apical slope, covered by 5 pairs of puncture rows; lateral rows rather regular, interior rows irregular, forming by sparse punctures, next rows almost regular. Prosternal process with impression in apical ⅓. Metasternum marginated. Last abdominal sternite marginated, in male it is short, truncate, bisinuate, with small medial impression. This species is close to *Ch. stachydis*, and differs mostly in pronotal disc punctate, pronotum without distinct lateral impression, and strongly roundly broadened anteriorly, elytra broader and more convex, with more distinct humeral callus, without sutural stria at apical slope.

Remark. The original description does not include the following 13 subgeneral features (see above, Chapter 1. Morphology and Taxonomy): numbers 3, 6–9, 13–19, 21.

Species from S-E Spain

***Chrysolina murciana* Kippenberg, 2012b**

The present diagnosis is based on the original description (Kippenberg, 2012b) and photos of the holotype (dorsal view, maxillary palpus, prosternum, fore-tarsus underside) (Fig.) kindly presented me by the author, H. Kippenberg. It includes only important diagnostic features.

Body short oval, very convex, with lateral sides rounded. Dorsum dark bronze, moderately shining, elytral lateral side up to extreme side puncture row is reddish; antennae, maxillary palpi, and legs dark brown till blackish, 1st antennomere and 4th tarsomere indistinctly lighter. Antennae narrow. Last maxillary palpomere narrow, oval, truncate, similar to penultimate one in length and width.

Pronotum broadest basally, with lateral sides strongly roundly narrowed forward. Lateral callus weakly convex, separated from disk with only numerous, moderately large punctures in anterior ¾, and with narrow furrow, filled with large punctures in posterior ¼. Surface of pronotum reticulated and covered with sparse very fine punctures. Prosternal process covered by large wrinkled punctures. Elytron with very weak humeral callus, with quite regular, distinctly paired rows of dense, moderately large punctures. Scutellar row long, of about 15 punctures. 5th row consists of about 25 punctures. Elytral intervals hardly convex or flat, with only sparse, indistinct fine punctures. Elytral surface reticulated. Tarsomeres 1–3 entirely pubescent on underside, narrow. Body length about 9 mm, width about 5.5 mm.

Remark. The following 14 subgeneral features are not included in the original description (or unavailable for study, as only one female is known till now) and not visible on the available photos. They are: 3, 5–10, 13–15, 18–21 (See above, Chapter 1. Morphology and Taxonomy).

***Chrysolina murciana* figure:** female, holotype (S-E Spain). (Photo by H. Kippenberg)

Supplement

Genus *Camerounia* Jolivet, 1949

Iscadida (*Camerounia* Jolivet, 1949: 7) (type species: *Horatopyga ornata* Baly, 1876, by the original designation)

Diagnosis

Shape: hemispherical viewed laterally, pronotum cordiform and elytra rounded viewed dorsally (Fig. 1). Dorsum shagreened, moderately shining, pronotum densely minutely punctulated (punctules as large as cells of microsculpture). Color variable: 1) underside rufous, elytra reddish brown with weak blue reflection, each elytron with 9 large rounded yellow spots, scutellum reddish brown, antennae, palpi, apices of mandibles, tibiae, tarsi, mid- and hind-trochanters black, 1st antennomere, femora, head, and pronotum reddish (Fig. 1); 2) underside, head, and pronotum dark reddish brown, scutellum, legs, palpi, apices of mandibles, and antennae black, elytra black with blue, violet, or bronze reflection, each elytron with 7 or 9 rounded yellow spots (Fig. 6); 3) underside, head, and pronotum dark reddish brown, scutellum, legs, palpi, mandibles, and antennae black, elytra black with blue reflection, each with very large rufous spot in basal ⅔ (only narrow basal, lateral, and sutural margins black), and with 3 rounded yellow spots in apical ⅓ (Fig. 7).

Last maxillary palpomere (Fig. 2) almost cylindrical, as long as wide, similar to penultimate palpomere in length and width, similar in both sexes. Antenna inserted 3 X closer to clypeus than to eye; short, with antennomere 11 reaching pronotal base. Antennomeres 5–10 gradually broadened; antennomeres 9–10 as broad as 1; antennomere 10 as long as broad. Eyes very narrow, vertical. Orbital line obsolete, short, developed only above eye.

Pronotum 2 X broader than long, 1.3 X broader between posterior angles than between anterior ones, weakly convex (viewed from the front), broadest before mid-length, with lateral sides rounded, with emarginations before posterior angles. Anterior angles strongly produced. Anterior side of pronotum entirely marginated, with setae. Anterior setiferous pore present. Pronotum laterally swollen from anterior angle to emargination before base. Pronotal lateral impressions absent and replaced by few large punctures unevenly placed close to lateral margin. Punctures at pronotal disc fine, dense.

Prothoracic hypomeron (Fig. 8) almost flat, slightly broadly impressed laterally, without any wrinkles or with weak transverse wrinkles, with deep narrow lateral furrow. Basal fold absent. Intercoxal prosternal process parallel-sided, with broad medial impression covered by wrinkles along entire length; anterolateral portions of prosternum broad, flat.

Metasternum (Fig. 5) immarginated anteriorly between mid-coxae.

Elytron each 2 X longer than wide, with smooth and very weakly convex humeral callus, entirely confusedly punctate and slightly irregularly rugose. Punctures as large as those at lateral sides of pronotum. Single irregular puncture row placed along exterior border of epipleura. Sutural stria distinct at apical slope.

Elytral epipleura inclined outside, visible along entire length in lateral view, densely ciliate near apex and sparsely ciliate anteriorly (Figs. 6, 7).

Hind wings absent.

Tarsomeres 1–3 of all tarsi with entire sole in both sexes. Tarsomere 1 of all tarsi slightly broader in male (Fig. 4) than in female. Claw tarsomere without denticles beneath.

Pygidium with distinct longitudinal sulcus along entire length.

Last abdominal sternite convex, broadly truncate apically in male, and convex, evenly rounded apically in female.

Length: 8.2–8.7 mm (male), 9.7–10.4 mm (female).

Aedeagus (Fig. 3) 3.2–3.4 mm long, tube-shaped, moderately curved dorso-ventrally, with apex simple, truncate; flagellum thin, simple, exposed.

Differential diagnosis

Camerounia inhabits African equatorial forest zone and looks like the members of the subgenus *Polystictella* of the genus *Chrysolina*. It differs from *Polystictella* in the elytral epipleura inclined outside, pronotum emarginated laterally before posterior angles, and metasternum immarginated anteriorly between mid-coxae (in *Polystictella*, the elytral epipleura horizontal and invisible in lateral view in apical ½, pronotum evenly arc-shaped laterally, and metasternum entirely marginated anteriorly).

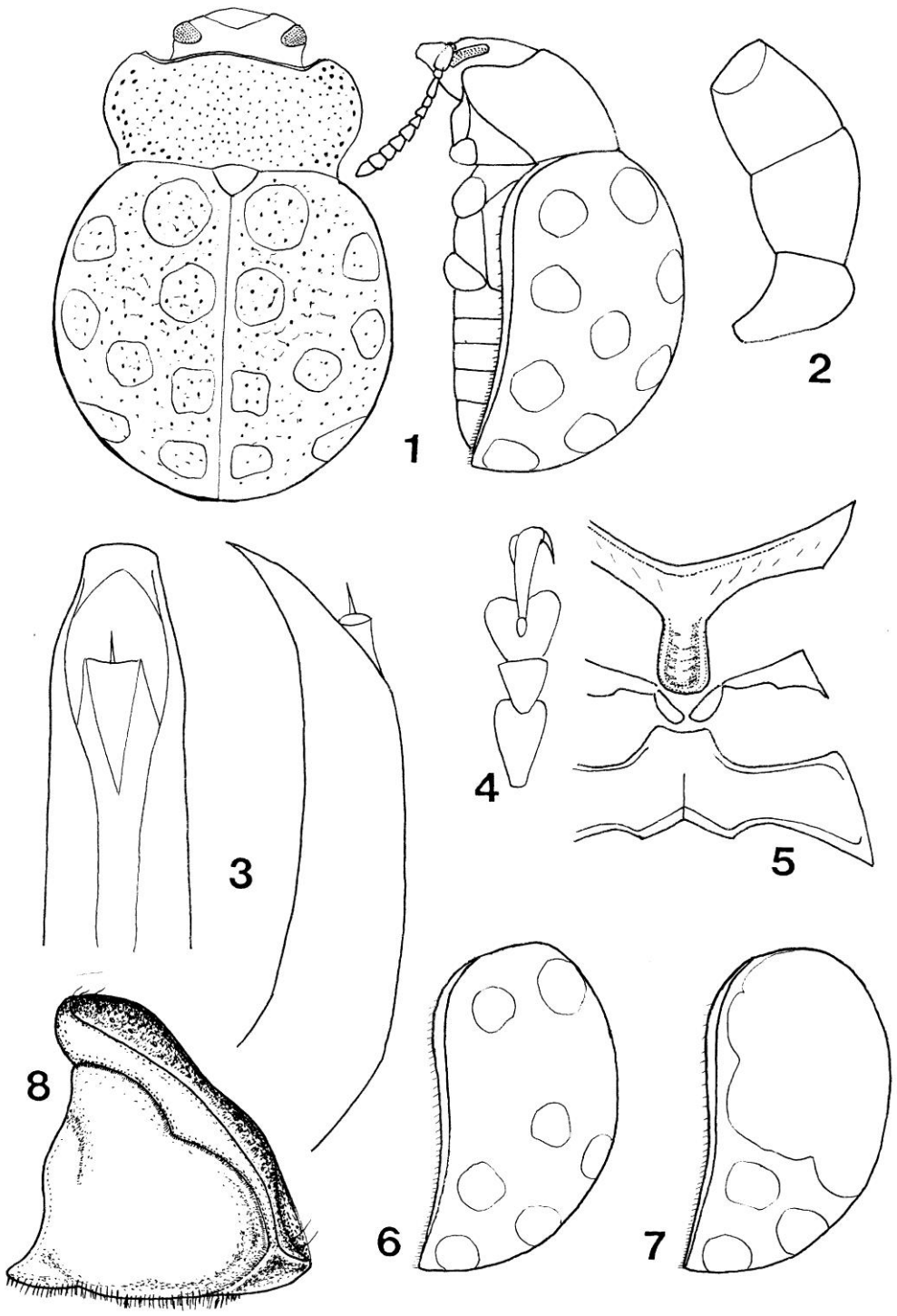
Camerounia is closer to the genus *Sphaerolina* from India than to any other subgenera of *Chrysolina* because of body very convex, hemispherical in lateral view, pronotum cordate, metasternum immarginated anteriorly between mid-coxae, antennomeres 7–11 broadened and depressed, and eyes narrow, vertical.

Genus *Camerounia* includes the one species:

ornata (Baly, 1876) ♂♀ Equatorial Africa

Horatopyga ornata Baly, 1876: 79 ("Guinea, Camaroons"), nec Chrysomela ornata Ahrens, 1812: 13 [presently, synonym of Ch. cerealis megerlei (Fabricius, 1801)]

Chrysomela coarctata Weise, 1912: 83 ("Kamerun: Buea")



***Camerounia* figures:** *C. ornata*: 1–5 – male (Cameroon: Soppo): 1 – total dorsal and lateral view, 2 – maxillary palpus, 3 – aedeagus, dorsal and lateral view, 4 – fore-tarsus, 5 – prosternum, mesosternum, and metasternum; 6–7 – variability of elytral pattern, lateral view: 6 – male (Cameroon: Musake-Hütte), 7 – female (Cameroon: Buea); 8 – prothoracic hypomeron, male (Cameroon: Soppo). (Orig.)

Genus *Timarchomima* Bechyné, 1950a

Chrysolina (Timarchomima Bechyné, 1950a: 65) (type species: Chrysomela indica Jacoby, 1893, by the original designation)

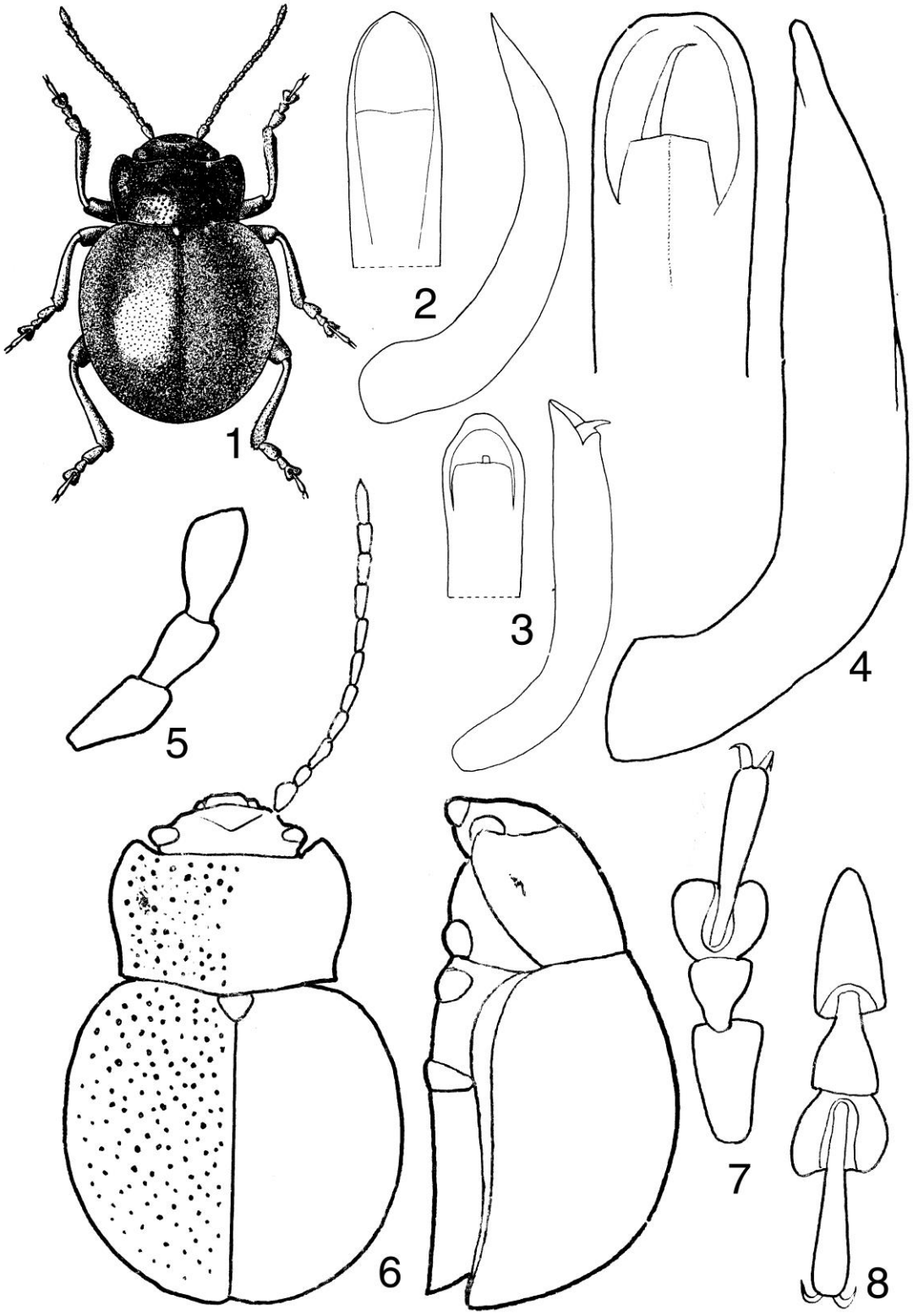
clavareaui (Chen, 1933) ♂♀ S India
Chrysomela Clavareaui Chen, 1933: 381 ("Indes orientales: Madura", holotype examined by Daccordi, 1980a)
indica (Jacoby, 1893) ♂♀ S India
Chrysomela indica Jacoby, 1893: 105 ("Southern India", syntypes in BMNH (examined by Daccordi, 1980a) and MCZ (examined), nec Chrysomela indica Hope, 1831: 29 [presently, Agrosteomela indica]
longicornis (Maulik, 1926) ♂ S India
Chrysolina longicornis Maulik, 1926: 19 (in key), 25 (description) ("Pondicherry", holotype in BMNH, examined by Daccordi, 1980a and by me)

Differential diagnosis

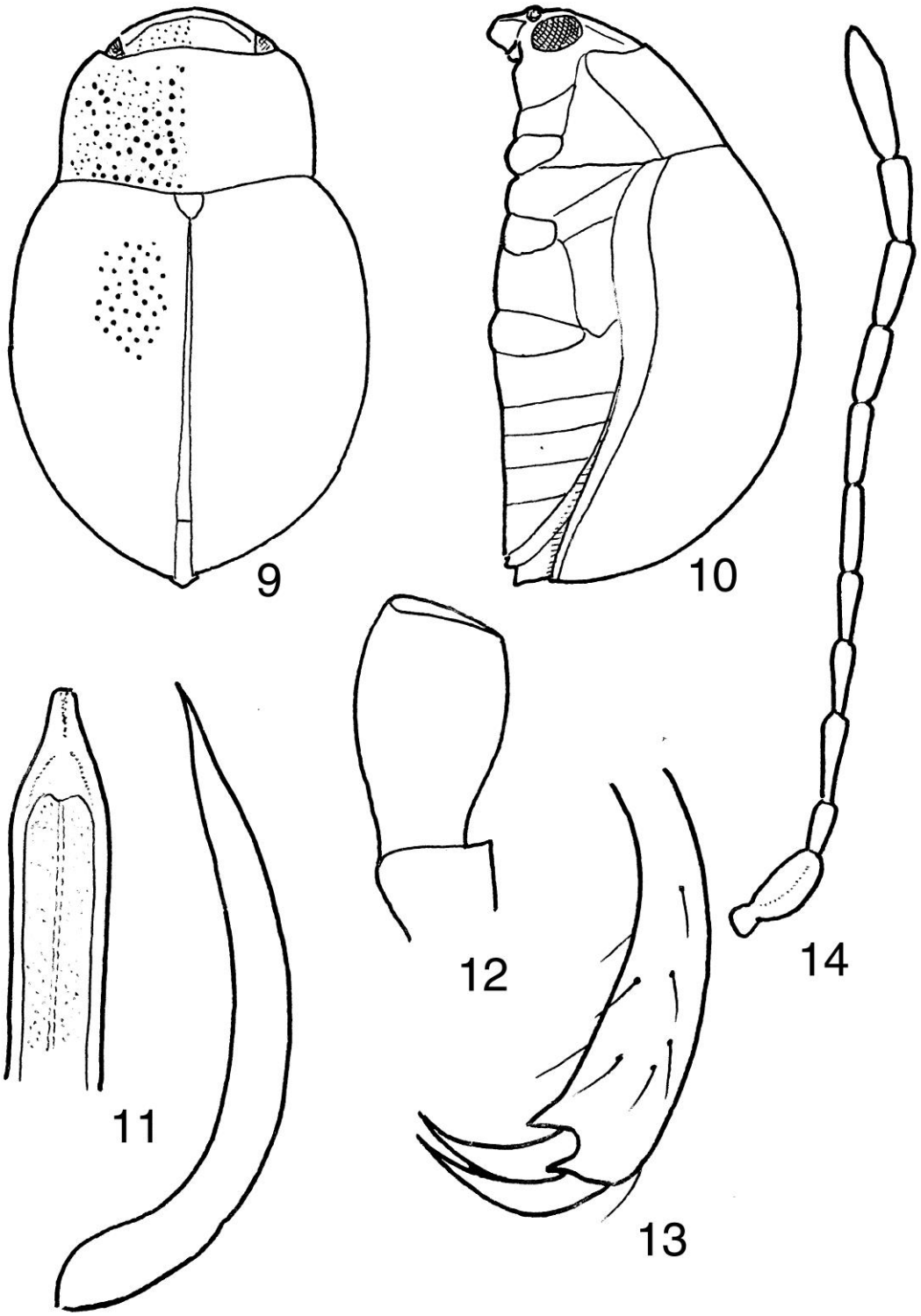
This genus in endemic for S India. It resembles externally the members of the subgenus *Chrysolina* (*Timarcholina*) from India and Sri Lanka and differs in metasternum immarginated anteriorly (in *T. indica* and *T. longicornis*) and in elytral punctures dense, entirely irregular. Due to the metasternum marginated anteriorly, the species *clavareaui* occupies an intermediate position between the genus *Timarchomima* and subgenus *Chrysolina* (*Timarcholina*).

Key to species

1(4) Metasternum immarginated between mid-coxae. Elytral punctures very fine, much smaller than those at pronotal disc, very dense.
2(3) Body larger (8.4–10.6 mm). Elytra dull, red or purple red with sutural stripe and sometimes diffuse hook-shaped discal stripe bronze. Head and pronotum bronze or black, usually with blue reflection. Figs. 1, 2. S India.
T. indica (Jacoby, 1893)
3(2) Body smaller (7.4–7.5 mm). Elytra shining, rufous with bronze reflection. Head and pronotum brown with bronze reflection. Figs. 9–14. S India.
T. longicornis (Maulik, 1926)
4(1) Metasternum marginated between mid-coxae. Elytral punctures moderately large, as large as those at pronotal disc, dense; with intervals covered by sparse, very fine punctures. Dorsum shining. Head and pronotum bronze, elytra brown with bronze reflection. Length 6.7–8.5 mm. Figs. 3–8. S India.
T. clavareaui (Chen, 1933)



***Timarchomima* figures 1–8:** 1–2 – *T. indica*: 1 – total dorsal view, 2 – male, syntype (S India), aedeagus, dorsal and lateral view; 3 – *T. clavareaui*, male, holotype (S India), aedeagus, dorsal and lateral view; 4–8 – *T. clavareaui* (?), male (S India): 4 – aedeagus, dorsal and lateral view, 5 – maxillary palpus, 6 – total dorsal and lateral view, 7 – fore-tarsus, 8 – hind-tarsus. (After: Maulik, 1926: 1; Daccordi, 1980a: 2–3; others – orig.)



Timarchomima **figures 9–14:** *T. longicornis*, male, holotype (S India): 9 – total dorsal view, 10 – total lateral view, 11 – aedeagus, dorsal and lateral view, 12 – last maxillary palpomere, 13 – 4th hind-tarsomere, 14 – antenna. (Orig.)