

ENTOMOLOGICAL REVIEW

A translation of the quarterly journal ENTOMOLOGICHESKOYE OBOZRENIYE,
a publication of the USSR Academy of Sciences.

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PUBLISHED FOR
THE ENTOMOLOGICAL SOCIETY OF AMERICA

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Translation Editor
C. F. W. MUESEBECK,
Smithsonian Institution

Volume 58: United States \$109.00; elsewhere \$116.00.

Order from
SCRIPTA PUBLISHING CO.
7961 Eastern Avenue
Silver Spring, MD 20910

Second-class postage paid at Silver Spring, MD

ENTOMOLOGICAL REVIEW

Volume 58, Number 2

April-June 1978

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A REVIEW OF PALEARCTIC GROUPS OF THE TRIBE ACMAEODERINI (COLEOPTERA, BUPRESTIDAE)

M. G. VOLKOVICH (VOLKOVITSH)

Members of the tribe Acmaeoderini form a natural taxon that is morphologically well segregated from related groups. However, the study of this tribe is made very difficult by the lack of a taxonomic revision at the level required by present day systematics, by the paucity of diagnostic characters and the extremely confused synonymy. Owing to the inaccuracy of descriptions it is often impossible to form an idea of particular species* and their systematic position. Hitherto there has been no consensus among researchers on the content and taxonomic status of the groups included in the tribe; some authors regard it as consisting of one genus.

Marseul (1865) distinguished a group of Ethiopian species in the genus *Acmaeodera*, for which he established the subgenus *Ptychomus*. The American authors Horn (1878) and Fall (1899), who based themselves on the structural characters of the anterior margin of the prothorax, the legs and the sculpture of the elytra, subsequently distinguished 6 groups of Nearctic species. Kerremans (1906) extended this classification to the Palearctic, Ethiopian and Indo-Malayan members of the genus, most of which he included in a new group Incisae completely absent from the New World; species of the subgenus *Ptychomus* formed a separate group. Consequently, the genus *Acmaeodera* was divided into 8 groups - Graciliformes, Costulatae, Lobatae, Sinuatae, Emarginatae, Truncatae, Incisae and *Ptychomus*, that, with the exception of the subgenus *Ptychomus*, had no taxonomic status. Some American investigators continue to use the Horn-Fall system, although the classification advanced is based on variable characters having little weight. At the same time attempts have been made to distinguish natural groups, drawing on more reliable taxonomic characters. The following taxa are currently included in the tribe: *Acmaeodera* Eschsholtz, 1829; *Ptychomus*; *Paracmaeodera*** *Acmaeoderella*; *Microacmaeodera*; *Acmaeoderopsis*; *Anambodera* and *Rugacmaeodera*. Because the limits of these taxa are inadequately defined and many characters overlap, there are differences among present day students of the Buprestidae concerning the categories of the groups listed. For example, Cobos (1958) regards the taxa *Ptychomus*, *Paracmaeodera* and *Acmaeoderella* as genera, Mateu (1972) treats *Ptychomus* as a genus, but *Paracmaeodera* and *Acmaeoderella* as subgenera of the genus *Acmaeodera*; Holm (1978) treats *Ptychomus* and *Paracmaeodera* as subgenera of the genus *Acmaeodera*, and *Acmaeoderella* as a group of species in the subgenus *Acmaeodera*.

In the period 1972-1978 we examined extensive material of the Palearctic and, to a lesser extent, the Indo-Malayan, Nearctic and Ethiopian members of the tribe Acmaeoderini. A study of the type-specimens of nearly 150 species made it possible to detect previously undescribed species and to establish new synonymy (Volkovich, 1976a, b, 1977a, b, 1978). Evaluation of the accumulated data enabled us to draw conclusions on the classification of this group of the Buprestidae. In view of the impossibility of giving expanded descriptions of the taxa in the paper we shall refer to the works of the respective authors.

The author would like to express his deep gratitude to Doctor S. Bily, of the National Museum in Prague, Czechoslovakia (NMP), to Dr. A. Descarpentries, of the French

*According to Obenberger (1956), there are 271 species of the tribe Acmaeoderini in the Palearctic fauna.

**The taxa *Paracmaeodera* and *Ptychomus* are not considered in the present paper, although some of the species belonging to them are known from the Palearctic.

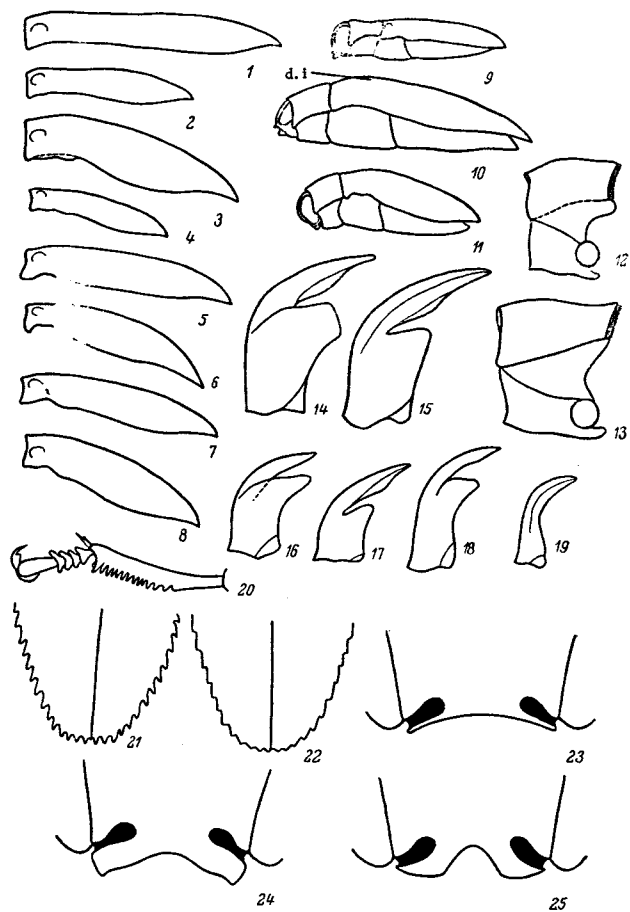
National Museum of Natural History in Paris (MNHP), to Dr. G.H. Nelson, of the College of Osteopathic Medicine, Kansas City, (USA), to Dr. S. Wellso, of Michigan State University, East Lansing, (USA) and to other individuals who sent valuable material for study.

TAXONOMIC CHARACTERS OF BUPRESTIDS OF THE TRIBE ACMAEODERINI AND PARALLELISM

Differences concerning the taxonomic composition of the tribe and the status of the groups incorporated in it are due to differences in the assessment of the taxonomic weight attached to individual morphological characters. Furthermore, because of established tradition, most authors attempt to describe the taxa that are distinguished monothetically and, should the main diagnostic characters overlap, they refer to intermediate species, disregarding the possibility of parallel evolution. No use is made of genital structure, and Holm (1978) even stresses that this character provides less information than external characters.

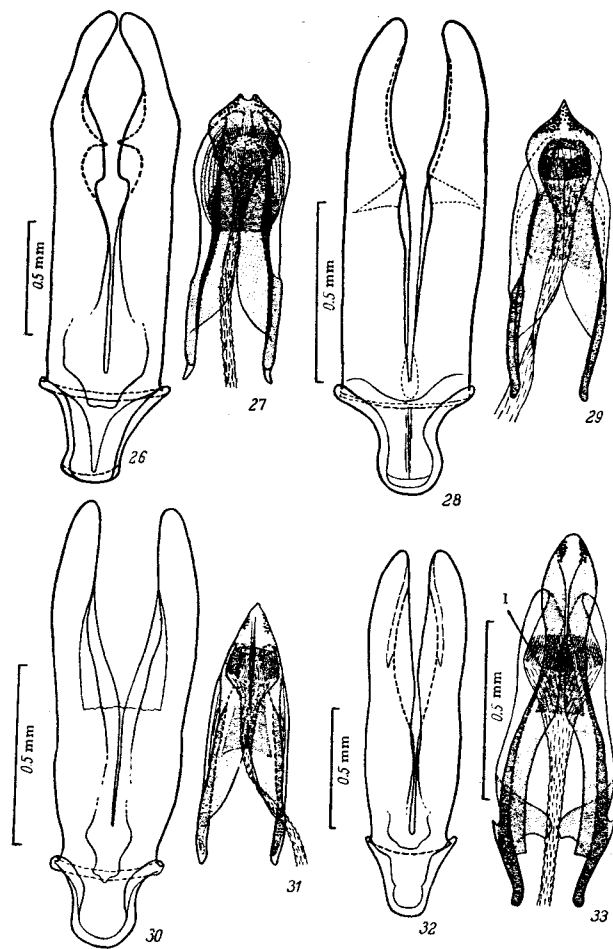
Thorough investigation of the morphology of the beetles has shown that most of the characters used in the classification of the Acmaeoderini develop in parallel in different, frequently unrelated groups. The inception and refinement of a distinctive type of flight apparatus, which we shall describe as acmaeoderoid, should be regarded as the main trend in the evolution of the Acmaeoderini. This type of flight apparatus has some similarity to the oryctoid type (Schneider, 1978), but its establishment was accompanied by profound morphological modifications affecting the entire pterothorax, and by a different mode of folding of the wings. The elytra are closely joined along the suture in the Acmaeoderini and form a single morpho-functional complex with the mesonotum, a complex of limited mobility relative to the other elements of the pterothorax, and one that forms a kind of protective casing. In the course of refinement of the flight apparatus and the development of a distinctive type of flight in the Acmaeoderini there was modification in the shape of the body (Figs. 9-11); we should note, in particular, the appearance of a dorsal inflection (Fig. 10, d, 1), reduction of the epipleura of the elytra and the development of an inflection or notch on them helping the wings to function (Figs. 1-8), the appearance of a collar on the prosternum and of recesses to house the antennae and the legs, reduction of the mesepimera and development of other adaptive formations. There are also other evolutionary trends and associated modifications, for example adaptation to arid conditions (the formation of a scaly cover), pollenophagy (modification of mouth parts and appearance of pharyngeal processes in the fore gut), development of sexual dimorphism (appearance of secondary sexual characters in both sexes). Consequently, most of the external characters are of an obviously adaptive nature and therefore need careful evaluation; these characters or sets of correlated characters develop in parallel owing to existence under extremely similar conditions. The parallel development of some characters not of obviously adaptive importance clearly follows Vavilov's law of homologous series (1968). We may take as examples of such parallelism, due apparently in the main to the shared properties of the genotype, the similar states of the aedeagus in Nearctic species of the genus *Acmaeoderopsis* and Palearctic species of the genus *Xantheremia*, reduction of the clypeus in Nearctic species of the genus *Anambodera* and Palearctic species of the genus *Acmaeoderella*, and also the occurrence of similar systems of markings in the different groups. On the other hand, some structural characters of the aedeagus, in particular the elongation of their components, may be due to elongation of the genital tract of the female owing to elongation of the ovipositor (a result of specialization); markings may also be of functional significance, following Gloger's rule.

It was predominantly the structural characters of the genitalia that were used by us in constructing the classification. Although adaptive features are often to be noted in ovipositor structure, and although various specialized forms are encountered, which appreciably detracts from the taxonomic weight of a given character, it is sometimes possible to establish comparative morphological series distinctive to only one particular taxon. Transition from a short urtic-like ovipositor (Figs. 74-77) to a long tubular ovipositor (Figs. 80-83), due, in our opinion, to transition from laying eggs on the surface of the substrate to laying eggs in cracks and crannies in the bark, axils, etc., is a feature of most groups. Specialized forms may arise at any stage in this transition. We may include among them the ovipositors of *Acmaeodera quadrivittata*, *A. wethloi*, *Acmaeoderella albifrons* (Fig. 84), *A. inquirenda*, etc. However, the ovipositors of members of the



Figs. 1-25. Acmaeoderini, structural details.

1-8) Shape of elytra (side view): 1) Acmaeodera (Acmaeodera) semenovi; 2) A. (Acmaeodera) pilosellae; 3) A. (Loepotethya) ocellata; 4) A. (Palaeotethya) bipunctata; 5) A. (Acmaeotethya) degener; 6) A. (Cobosiella) luzonica; 7) Xantheremia koenigi; 8) Acmaeotethya (Carininota) flavofasciata; 9-11) body shape (side view): 9) Acmaeodera (Acmaeotethya) ottomana; 10) A. (Acmaeodera) yunnana (d.i) dorsal inflection; 11) Acmaeoderella (Euacmaeoderella) dilatatisquamis; 12-13) prothorax (side view): 12) Acmaeodera (Palaeotethya) bipunctata; 13) A. (Acmaeotethya) pallidepicta; 14-19) claws of fore tarsi: 14) Acmaeodera (Acmaeodera) lata Heyd., ♂; 15) the same, ♀; 16) Acmaeoderella (Acmaeoderella) abeillei (Pic), ♂; 17) the same, ♀; 18) Xantheremia koenigi; 19) Acmaeoderella (Euacmaeoderella) personata; 20) Acmaeodera (Lisposcelis) jakobsoni, fore tibia and tarsus; 21-22) shape of apical elytral teeth: 21) Acmaeodera (Acmaeodera) wethloi; 22) A. (Acmaeodera) edmundi; 23-25) shape of clypeus: 23) Acmaeoderella (Carininota) repetekensis; 24) Xantheremia koenigi; 25) X. philistina.



Figs. 26-33. Acmaeodera (Acmaeodera), male genitalia.

26-27) A. rufocincta: 26) Tegmen; 27) penis; 28-29) A. cecropia: 28) tegmen; 29) penis; 30-31) A. damasensis (Pic) (lectotype, MNHNP): 30) tegmen; 31) penis; 32-33) A. babataensis: 32) tegmen; 33) penis [1) lamina].

Nearctic genus Acmaeoderopsis and of the Palearctic-Ethiopian genus Xantheremia, (Fig. 78, see also Volkovich, 1978) form a specific comparative morphological series. The structure of the aedeagus is more conservative; several structural types typical of individual phylogenetic trunks of the tribe Acmaeoderini may be distinguished. Since we are unable here to demonstrate the comparative morphological series of the state of the aedeagus in the tribe Acmaeoderini, we should note that the structural types of aedeagus represented in this tribe originate from types similar to those noted in species of the subgenus

Acmaeodera, especially of the elater, pulchra and cecropia groups (Figs. 26-33). In distinguishing types and shapes of aedeagus we concentrated on the structure of the penis.

When erecting taxa it is also essential to consider their ranges. Most species and groups of the tribe Acmaeoderini have fairly narrow ranges. Species of the tribe in the Palearctic are mainly confined to the Mediterranean subregion of the Hesperian (Mediterranean-Makaronesian) evergreen forest region and the Iranian-Turanian subregion of the Sethian (Saharan-Gobi) desert region [in this paper we employed the division of the Palearctic and the nomenclature of ranges proposed by Yemel'yanov (1974)]. Certain species that have the widest ranges penetrate into the European nemoral and the Scythian steppe regions. The scanty fauna of the West Orthrian subregion of the Orthrian evergreen forest region (Himalayan-South Chinese-South Japanese*), containing endemic species of an obviously relict nature that possibly existed from the Pliocene (*Acmaeodera semenovi*, *A. yunnana*), is extremely interesting. Most species are associated with types of vegetation that may be described as xerophilous open woodland; many members of the genus *Acmaeoderella* also develop on herbaceous vegetation.

In referring to what may be called "intermediate" forms, it should be noted that Holm (1978) places some Ethiopian species of the tribe Acmaeoderini in the genus *Acmaeoderella* (a species group according to Holm) and regards them as transitional between Caspian species of the *signata* group of the genus *Acmaeodera* and Palearctic species of the genus *Acmaeoderella*; the similarity is based on external morphological characters, without employing genital structure. Some of these species probably belong to the subgenus *Rugacmaeodera* of the genus *Acmaeodera*. Although the external similarity between *Rugacmaeodera* and *Acmaeoderella* is in fact very great by virtue of the parallel development of a number of characters, they are readily distinguishable by the structure of the male genitalia. *A. flavipennis*, *A. straminae* and *A. fasciata* are placed in the new genus *Xanthermia*. In the structure of the aedeagus, which has two apodemes, and in certain other characters *Acmaeodera tantilla*, differs greatly from all known members of the tribe Acmaeoderini and it is possible that a separate genus must be established for this species. Consequently, judgements concerning similarity based on an incomplete study of external characters may lead to mistakes owing to the parallel evolution of such characters.

THE CLASSIFICATION OF PALEARCTIC MEMBERS OF THE TRIBE ACMAEODERINI

We must first solve the question of the type-species of the genus *Acmaeodera*. Eschscholtz (1829), who described the genus, included 5 species in it: *A. viridiaenea*, *A. flavofasciata*, *A. ruficaudis*, *A. ornata* and *A. cylindrica*. In the subsequent erection of taxa of various rank no type-species was designated for the nominate subgenus. Since the first 3 species are now incorporated in other taxa, we designate *Buprestis cylindrica* as the type-species of the genus *Acmaeodera* (type by subsequent designation).

Genus *ACMAEODERA*

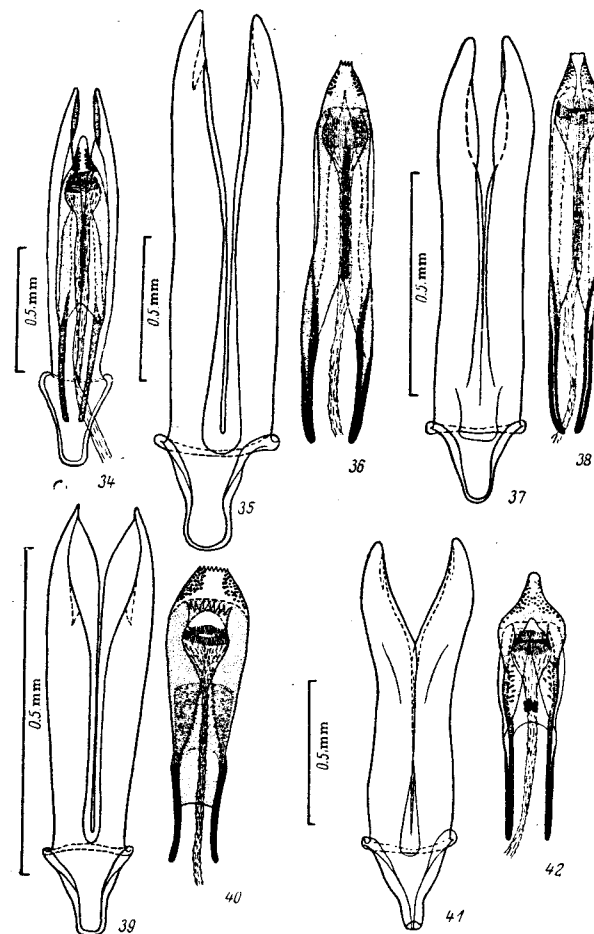
Eschscholtz, 1829: 9.

Aedeagus depicted in Figs. 26-38, 43-52; apophyses of penis short in most instances and undifferentiated; inner folds only occasionally merging apically and forming a cone. Clypeus (Fig. 25) not reduced, broad, with a deep notch in front. Mesepimera prominent. Pubescence consisting of hairs and setae, occasionally scales. A more detailed description is given when the subgenera and species groups are described.

Subgenus *ACMAEODERA*

Aedeagus depicted in Figs. 26-33; lamina (Fig. 33, l) usually large and broad; 8th sternite with membranous areas on anterior margin in most species (Fig. 67), apophyses

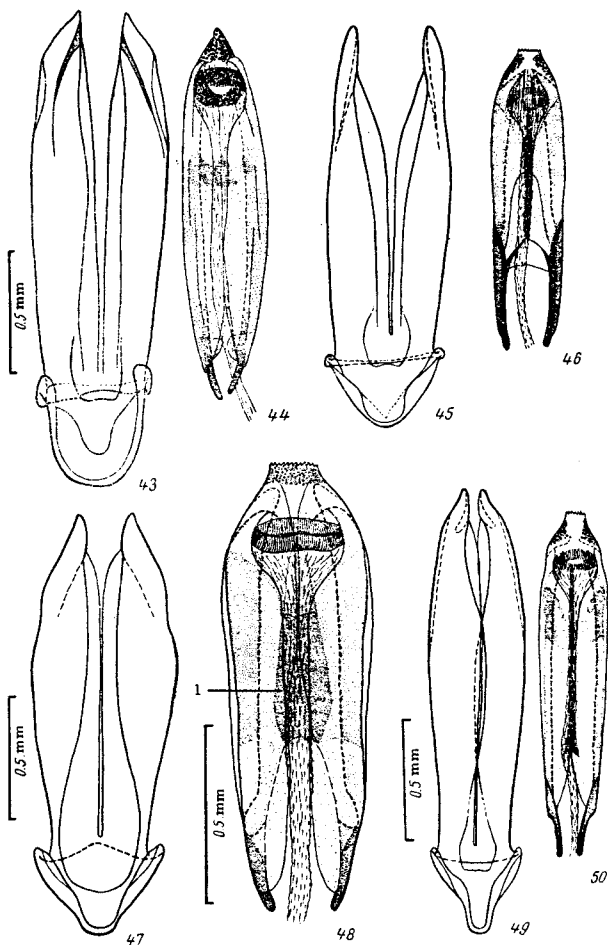
*Translator's note. This in fact includes the East Orthrian subregion in Yemel'yanov's classification.



Figs. 34-42. *Acmaeoderini*, male genitalia.

- 34) *Acmaeodera (Lisposcelis) jakobsoni*, aedeagus (holotype, NMP); 35-36) *A. (Loepotethya) ocellata*; 35) tegmen; 36) penis; 37-38) *A. (Palaeotethya) quadrifaria*: 37) tegmen; 38) penis; 39-40) *Microacmaeodera longicornis*: 39) tegmen; 40) penis; 41-42) *Xanthermia philistina*: 41) tegmen; 42) penis.

of 9th tergite isolated (Fig. 68). Ovipositor (Figs. 74-77) urite-like, sometimes greatly modified. Body flattened or terete (Fig. 9), sometimes with expressed dorsal inflection (Fig. 10, d.i). Sides of pronotum often with strong projections to behind the middle or in the posterior third; posterior margin of hypomeres strongly curved (Fig. 12); body surface covered with umbilicate punctures, often forming reticulate sculpture with concentric rugae, less frequently isolated umbilicate punctures; pubescence consisting of hairs and setae. Epipleura of elytra straight or basally slightly curved (Figs. 1, 2), without



Figs. 43-50. *Acmaeodera* (*Acmaeotethya*), male genitalia.

43-44) *A. sedecimmaculata*: 43) tegmen; 44) penis; 45-46) *A. uvarovi*: 45) tegmen; 46) penis; 47-48) *A. pallidepicta*: 47) tegmen; 48) penis [1] lamina; 49-50) *A. crinita*: 49) tegmen; 50) penis.

incision; shape of teeth on lateral margin variable. Elytra with markings or unicolorous. Hind coxae almost invariably bearing a tooth on outer margin. Tarsal claws with strong teeth. Mediterranean subregion of Hesperian region, West Orthrian subregion of Orthrian region, Sethian region.

The subgenus incorporates several groups, including monotypic groups. These groups usually occupy isolated ranges and are apparently the remains of lines becoming extinct. We should emphasize the external similarity of some of them to Nearctic groups that contain a large number of species at the present time.

inquirenda Group

Male unknown. Ovipositor urite-like, greatly modified (Volkovich, 1977b). Body elongated, flattened (Fig. 9). Sides of pronotum regularly rounded; surface covered with umbilicate punctures forming reticulate sculpture, without rugae and with short appressed hairs. Epipleura of elytra with a slight inflection in anterior third (Fig. 2); teeth of lateral margin smoothed. Elytra dark brown, with light longitudinal stripes; elytra covered with very short inclined setae. Hind coxae with a blunt tooth. Tarsal claws with a small basal tooth. Turkestanian Province of the Iranian-Turanian subregion of the Sethian region.

Composition: *A. inquirenda*

elater Group

Aedeagus depicted in Figs. 30-31 (see also: Volkovich, 1976a); penis weakly sclerotized, with large lamina. Ovipositor depicted in Fig. 74. Body elongate, slender, flattened (Fig. 9). Antennae of males longer and more strongly broadened than those of females. Pronotum broadened in posterior third; covered with frequent umbilicate punctures forming reticulate sculpture, less frequently superficial cells, without concentric rugae; pubescence consisting of erect and inclined setae and appressed hairs. Epipleura of elytra practically straight (Fig. 1), lateral margins slightly crenulated from the middle of the elytra. Elytra dark brown or light brown, unicolorous, or with an indistinct spot broadening rearward. Teeth of hind coxae often long and sharp, apparent from above. Claws bearing small teeth, identical in both sexes. Mediterranean subregion of the Hesperian region, Gobi Province of the Central Asian subregion of the Sethian region.

Composition: *A. elater*, *A. damasensis*, *A. medvedevi*.

cercropia Group

Aedeagus depicted in Figs. 28, 29. Female not known to the author. Body slender, terete. Sides of pronotum almost regularly rounded; its overall width greater than the width of the elytra; sculpture consisting of umbilicate punctures and strong concentric rugae occupying almost the entire surface, which is covered with appressed and inclined hairs. Epipleura of elytra arcuately curved under the humeri (Fig. 10); lateral margin slightly crenulated in posterior third. Elytra light brown, with large dark brown spots broadening rearward. Tooth of tarsal claw in male reaching apex of claw (Fig. 16). Eastern Mediterranean Province of Mediterranean subregion of Hesperian Province.

Composition: *A. cercropia*.

pulchra Group

Aedeagus depicted in Figs. 26, 27 (see also: Cobos, 1958); parameres with sharp projections on inner margins; penis weakly sclerotized, with a large lamina. Ovipositor urite-like. Body squat, flattened (Fig. 9). Sexual dimorphism is expressed in antennal structure. Sides of pronotum abruptly widened in posterior third; surface covered with fine umbilicate punctures, less frequently cells, without concentric rugae; pubescence consisting of erect and inclined hairs and setae. Epipleura practically straight in anterior third (Fig. 1); lateral margin sometimes bearing strong sawlike teeth (Fig. 21), more often small teeth (Fig. 22); markings of elytra greatly varied. Teeth of hind coxae weakly developed in some species. Teeth of tarsal claws larger in males than in females. Mediterranean subregion of Hesperian region, Tekni Province of Saharabian subregion of Sethian region.

Composition: *A. pulchra*, *A. revelieri*, *A. rufocincta*, *A. xanthelytra*, **A. moralesi*.*

*An asterisk designates species not known to the author.

semenovi Group

Male unknown. Ovipositor depicted in Fig. 77. Body squat and flattened (Fig. 9), black; elytra black-brown; covered above with long wavy black hairs, below with white and blackish straight hairs. Pronotum transverse, with regularly rounded sides, width greatest in the middle; sculpture consisting of very frequent umbilicate punctures, devoid of rugae. Epipleura of elytra straight in anterior third (Fig. 1); lateral margin with weak teeth in posterior third. Suture and 5th interval of elytra slightly carinately upraised. Hind coxae without a tooth. Claws with a perceptible basal tooth. Yunnan Province of West Orthrian subregion of Orthrian region.

A. semenovi.

This species is externally reminiscent of some Nearctic species, for example A. resplendens. In the structure of the ovipositor, the shape of the body, the sculpture of the pronotum and the punctuation of the elytra it may be converged with members of the elater and pulchra groups, from which it is distinguished by the shape of the pronotum and the long wavy pubescence.

cylindrica Group

Aedeagus depicted in Figs. 32, 33 (see also: Cobos, 1958); parameres lacking noticeable projections on inner margin; penis strongly sclerotized, lamina (Fig. 33, 1) triangular, often greatly reduced. Ovipositor urite-like (Fig. 76), sometimes greatly modified. Body broad, squat, flattened or with slightly apparent dorsal inflection. Sexual dimorphism in antennal structure is not manifested in all species. Sides of pronotum broadened in posterior third or slightly to rear of middle, sometimes with strong projections; surface covered with umbilicate punctures usually forming reticulate sculpture, often with concentric rugae. The pubescence consists of confused erect and inclined hairs, less frequently short appressed and inclined hairs. Epipleura straight or slightly curved in anterior third (Figs. 1, 2); teeth on lateral margin small and blunt (Fig. 22), occasionally sharp, serriform (Fig. 21). Markings and pubescence of elytra extremely variable. Hind coxae usually bearing a sometimes barely perceptible tooth. Claws almost identical in the two sexes, except that in A. lata the claw tooth of the male is far larger than that of the female (Figs. 14, 15). Mediterranean subregion of Hesperian region, Iranian-Turanian subregion of Sethian region.

Composition: A. cylindrica, A. pilosellae, A. flavolineata, A. affinis, A. brevipes, A. cerasina, A. lata, A. araxicola, A. transcaucasica, A. planidorsis, A. babatauensis, A. edmundi, A. chalcithorax, A. wethloi, A. bushirensis.

yunnana Group

Male unknown to the author. Ovipositor depicted in Fig. 75. Body squat, with marked dorsal inflection (Fig. 10). Pronotum lacking lateral projections, basally broadened; covered with umbilicate punctures forming reticulate sculpture on sides and thinned on disc, devoid of rugae; pubescence consisting of short appressed whitish and inclined brownish hairs. Epipleura of elytra noticeably curved in anterior third (Fig. 10); lateral margins with strong sharp teeth in posterior third (Fig. 21). Hind coxae without a tooth. Tarsal claws with a strong tooth. Yunnan Province of West Orthrian subregion of Orthrian region.

Composition: A. yunnana.

Subgenus LOEPOTETHYA

Aedeagus depicted in Figs. 35, 36; parameres long and narrow; penis weakly sclerotized, with incipient cone and fine rodlike lamina; chamber of ductus ejaculatorius small; apophyses relatively well differentiated; 8th sternite uniformly sclerotized and colored, apophyses of 9th tergite fused (Fig. 69). Female not known to the author.

Body squat, terete, with perceptible dorsal inflection (Fig. 11). Sides of pronotum lacking projections; posterior margins of hypomeres strongly curved (Fig. 12); surface covered with umbilicate punctures forming reticulate sculpture and without concentric rugae; sides with broad yellow stripes; pubescence consisting of long erect black hairs. Epipleura of elytra strongly curved beneath humeri (Fig. 3); lateral margin bearing sawlike teeth from the middle onward. Elytra with markings consisting of transverse yellow bands and separate spots, covered with long straight black hairs. Hind coxae without a tooth. Tarsal claws with a strong tooth. Levantine Province of Iranian-Turanian subregion, possibly Syrian Province of Saharabian subregion of Sethian region.

Type-species of subgenus, Acmaeodera ocellata.

A. ocellata.

In claw structure, body shape, pubescence and certain structural details of the aedeagus this species, forming the subgenus Loepotethya, resembles Nearctic species similar to A. pulchella; however, A. ocellata may be converged with members of the subgenus Palaeotethya on the basis of the sculpture of the head, pronotum and elytra, the shape of the clypeus and other characters.

Subgenus PALAEOTETHYA

Aedeagus depicted in Figs. 37, 38 (see also: Cobos, 1958); apophyses of penis differentiated, relatively long, lamina narrow; terminal segments of abdomen as in A. ocellata. Ovipositor tubular, of variable length. Body terete or flattened, lacking dorsal inflection. Sexual dimorphism is manifested in antennal structure. Pronotum lacking lateral projections; sculpture of head and pronotum consisting of umbilicate punctures giving way on pronotal disc to simple punctures and strong concentric rugae; posterior margin of hypomeres strongly curved (Fig. 12). Epipleura of elytra with weak, barely perceptible incision or inflection (Fig. 4); lateral margin with weak inconspicuous teeth in posterior third. Markings of elytra rather varied; unicolorous dark species and aberrations are encountered. Hind coxae with a sharp tooth or small projection on posterior margin. Tarsal claws with small teeth. Pubescence consisting of appressed, inclined and erect hairs and setae. Hesperian region (excluding Azores province of Makaronesian subregion). Indo-Malayan Kingdom (Sri Lanka).

Type-species of subgenus, Buprestis bipunctata.

rubromaculata Group

Aedeagus depicted in Figs. 37, 38; penis without a sclerotized area on dorsal surface; apophyses long and differentiated. Pronotum convex; lateral carinae barely traceable in basal half; pubescence of head and pronotum short, appressed, less frequently inclined (A. nigellata). Markings haphazard, usually consisting of irregular bands and spots, less frequently elytra dark, unicolorous or with regular longitudinal stripes. Hesperian region.

Composition: A. rubromaculata, A. flavonotata, A. quadrifaria, A. nigellata, A. leonhardi, *A. wollastoniana, *A. oranensis, *A. pasqualinii.

bipunctata Group

Penis with a small sclerotized area on dorsal surface; apophyses relatively short, weakly differentiated. Pronotum convex; lateral carinae barely traceable in basal half. Pubescence of head and pronotum fairly long and erect. Markings consisting of longitudinal rows of regular or blurred spots; less frequently elytra dark, without markings. Mediterranean subregion of Hesperian region.

Composition: A. bipunctata, A. guillebeaui.

algorica Group

Aedeagus as in members of the previous group. Pronotum flattened, lateral carina traceable to anterior angles; sides of pronotum covered with appressed hairs, head and pronotal disc with erect and inclined hairs and setae. Markings of elytra consisting of a longitudinal row of regular rounded yellowish spots. Western Mediterranean province of Mediterranean subregion, Hesperian region.

Composition: A. algorica.

Subgenus ACMAEOTETHYA

Aedeagus depicted in Figs. 43-50 (see also: Cobos, 1958); a detailed account is given in the descriptions of the groups. Ovipositor tubular, long. Body elongate, flattened, without dorsal inflection (Fig. 9). Sides of pronotum without projections; posterior margins of hypomeres practically straight (Fig. 13). Head covered with frequent umbilicate punctures, pronotum with umbilicate and raduliform punctures forming a superficial network, usually with strong concentric rugae on the sides and simple punctures on the disc. Epipleura of elytra with a prominent shallow incision beneath humeri (Fig. 5); lateral margin with weak teeth in posterior third. Pubescence of upper surface consisting of hairs or short setae, that of lower surface consisting of fine hairs. Markings of elytra consisting of spots and bands; species and aberrations with unicolorous dark elytra are known. Hind coxae with straight posterior margin, without a tooth. Tarsal claws with a small blunt tooth, less frequently with a long sharp tooth. Canaries province of Makaronesian subregion, Mediterranean subregion of Hesperian region; West Orthrian subregion of Orthrian region; Iranian-Turanian subregion of Sethian region. Some species penetrate into the Saharabian subregion of the Sethian region and into the European and Scythian regions.

Type-species of subgenus, Elater degener.

In genital structure and in a number of other characters the Caspian signata group (Holm, 1978) is similar to the Palearctic subgenera Palaeotethya and Acmaeotethya (especially members of the cisti group); all these groups are probably of common origin. However, the signata group ought, in our view, to be treated as a separate subgenus.

cisti Group

Aedeagus depicted in Figs. 45, 46; 8th sternite uniformly sclerotized and colored (Fig. 69); apodeme of tegmen apically narrowing abruptly; apophyses of penis fairly long, lamina thin; parameres apically without membranous external areas. Head and pronotum covered with short appressed and inclined hairs. Fore tibiae not broadened. Canaries province, Makaronesian subregion, Hesperian region; West Orthrian subregion, Orthrian region; Saharan province, Saharabian subregion, Sethian region. Some species are found in the Indo-Malayan Kingdom.

Composition: A. cisti, A. acaciae, A. uvarovi, A. eberti.

truquii Group

Male genitalia not investigated. Head and pronotum covered exclusively with appressed hairs. Pronotum rounded, convex, with no traces of a longitudinal groove or line, with barely perceptible impression of the base; sculpture consisting of very frequent simple punctures. Eastern Mediterranean Province, Mediterranean subregion, Hesperian region; Iranian-Turanian subregion, Sethian region.

Composition: A. bijuga, A. truquii.

pallidepicta Group

Aedeagus depicted in Figs. 47, 48; 8th sternite uniformly sclerotized and colored (Fig. 69); apodeme of tegmen apically narrowing appreciably; apophyses of penis short, lamina (Fig. 48, l) broad; parameres with apical marginal membranous areas. Pubescence consisting of appressed and inclined hairs and setae. Fore tibiae scarcely broadened apically. Khurasan Province, Iranian-Turanian subregion, Sethian region.

Composition: A. pallidepicta.

degener Group

Aedeagus depicted in Figs. 49, 50; 8th sternite uniformly sclerotized and colored (Fig. 69); apodeme of tegmen apically narrowing abruptly; lamina very thin, often reduced; parameres externally with apical membranous areas. Fore tibiae only slightly broadened apically. Pubescence consisting of appressed, inclined and erect hairs and setae. Mediterranean subregion, Hesperian region (A. degener also enters the European and Scythian regions), Iranian-Turanian subregion, Sethian region.

Composition: A. degener, A. quadrifasciata, A. crinita, A. saxicola, A. biseriata.

ottomana Group

Aedeagus depicted in Figs. 43, 44; 8th sternite with membranous areas on anterior margin (Fig. 67); apodeme of tegmen scarcely narrowing apically; apophyses of penis very short, lamina entirely or almost entirely reduced; parameres apically with membranous areas on the outside. Head and pronotal disc bearing long wavy hairs in many species. Most (but not all!) species have the fore tibiae noticeably broadening apically. Mediterranean subregion, Hesperian region; Western Orthrian subregion, Orthrian region; Iranian-Turanian subregion, Sethian region.

Composition: A. ottomana, A. rufoguttata, A. quadrizonata, A. sedecimnactata, A. undulata, A. kachetica, A. bartoni, *A. tassii, A. instabilis.

Subgenus LISPOSCELIS

Aedeagus depicted in Fig. 34; similar in structure to the aedeagus in the cisti group. Posterior margins of hypomeres practically straight (Fig. 13); head and pronotum covered with appressed hairs. Elytra with irregular yellowish longitudinal stripes. Fore tibiae with strong teeth on anterior margin (Fig. 20). West Orthrian subregion, Orthrian region.

Type-species of subgenus, Acmaeodera jakobsoni.

Composition: A. jakobsoni.

Subgenus COBOSIELLA

Aedeagus depicted in Figs. 51, 52; penis weakly sclerotized, with a weakly expressed cone in anterior part; terminal abdominal segments as depicted in Figs. 69, 70. Elongated, slender, with noticeable dorsal inflection (Fig. 10). Head and pronotum with round umbilicate punctures, without concentric rugae; posterior margins of hypomeres practically straight (Fig. 13). Epipleura of elytra with a deep incision beneath humeri (Fig. 6); lateral margins with sharp serriform teeth (Fig. 21). Markings usually consisting of a marginal stripe on the anterior half of the elytra; in some species this stripe bends toward the suture from the middle; irregular spots are also sometimes present. Hind coxae without a tooth on outer margin. Tarsal claws with a sharp slender tooth sometimes reaching the distal end of the claw (Fig. 16). Undersurface, at least on thorax, covered with branching hairs giving way in some species to branching scales; such hairs are occasionally found on the pronotum; dorsum covered with white short appressed hairs.

The only Palearctic member of the subgenus, *A. chotanica*, is found in the South Turanian and Turkestan provinces of the Iranian-Turanian and Central Asian subregions, Sethian region; the other species are found in the Indo-Malayan Kingdom.

Type-species of subgenus, *Acmaeodera chotanica*.

Composition: *A. chotanica*, *A. luzonica*, *A. stictipennis*, **A. interrupta*, **A. indica*, *A. beharensis*, **A. rondoni*, **A. sommailae*.

Species incertae sedis: *A. morio*, *A. reitteri*, *A. brunneipennis*, *A. coluber*, *A. graptelytra*, *A. beesoni*, *A. gardneri*.

Genus *MICROACMAEODERA*

Cobos, 1966: 310 (subgenus).

Aedeagus depicted in Figs. 39, 40; on the upper part of the penis there is an area that is probably homologous to the cone; lamina broad, shifted to lower half of aedeagus; apophyses long and differentiated; 8th sternite uniformly sclerotized and colored; 9th tergite very narrow, with fused apophyses. Ovipositor tubular, very long. Body small (body length 2.9-4 mm), elongate, slender, with prominent dorsal inflection (Fig. 10, see also: Cobos, 1966). Clypeus not reduced. Antennae of male half as long as the body, those of female reaching anterior margin of metathorax; segments greatly elongated, broadening from 3rd segment onward. Pronotum with uniformly rounded sides, without basal impressions; posterior margins of hypomeres strongly curved (Fig. 12); sculpture consisting of frequent simple punctures. Epipleura of elytra with a barely perceptible notch beneath humeri; lateral margin with weak teeth. Mesepimera prominent. Hind coxae without a tooth on outer margin. Legs slender, tibiae not broadened; tarsal claws with small teeth. Black, without metallic luster; elytra with short inclined setae, remaining surface with short appressed whitish and brownish hairs. Himalayan Province, West Orthrian subregion, Orthrian region.

Type-species of genus, *Acmaeodera longicornis*.

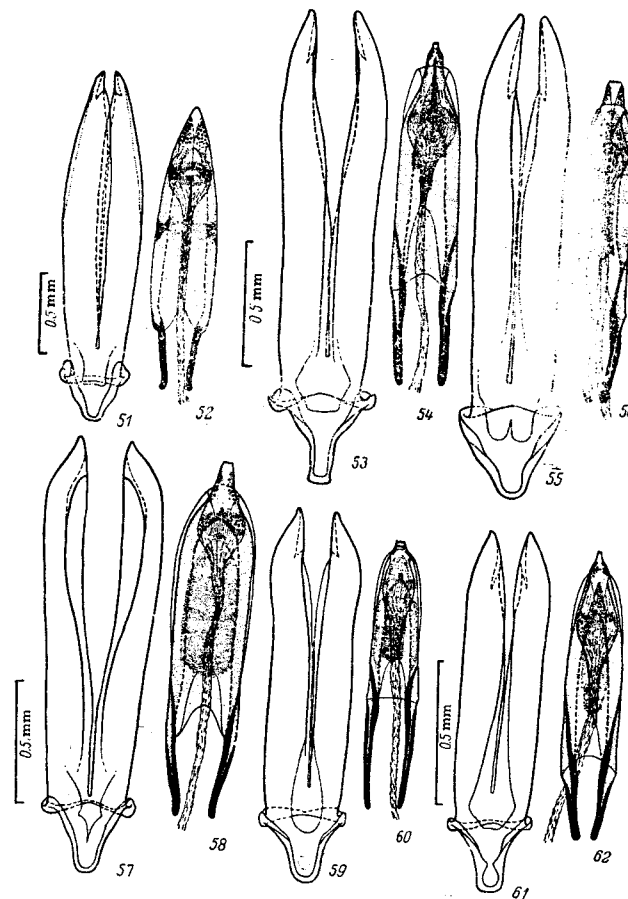
Composition: *A. longicornis*.

Genus *Xantheremia*.

Aedeagus depicted in Figs. 41, 42 (see also: Volkovich, 1978; Holm, 1978); apodeme of tegmen very long and narrow; penis weakly sclerotized, lamina greatly reduced, apophyses long, differentiated; 8th sternite uniformly sclerotized and colored, 9th tergite with fused apophyses. Ovipositor depicted in Fig. 78 (see also: Volkovich, 1978). Small, flattened or with prominent dorsal inflection (Fig. 10). Clypeus not reduced; vertex with a prominent longitudinal carina. Antennae short, slightly broadened from 5th segment onward. Pronotum broadened basally; posterior margins of hypomeres strongly curved (Fig. 12); sculpture consisting of frequent umbilicate punctures giving way to longitudinal cicatrices, or with concentric grooves bearing traces of punctures on the disc. Epipleura of elytra with strong notch beneath humeri (Fig. 7); lateral margin slightly crenulated. Mesepimera narrow. Hind coxae without a tooth on outer margin. Legs slender, tibiae not broadened. Tarsal claws with long blunt or sharp teeth (Fig. 18). Elytra yellowish or reddish, with irregular dark spots sometimes merging to form longitudinal stripes, less frequently unicolorous; pronotum occasionally with yellow spots on sides. Body covered with scales. Sethian region (apart from Central Asian subregion).

Type-species of genus, *Acmaeodera koenigi*.

Because of external similarity some authors include species of the genus *Xantheremia* in the genus *Acmaeoderella*. However, the species of each of these genera are typified by separate comparative morphological series of characters of the aedeagus and in the ovipositor. In this respect *Xantheremia* may be converged with members of the Nearctic genus *Acmaeoderopsis*, from which *Xantheremia* is distinguished by the presence of a



Figs. 51-62. *Acmaeodera (Cobosiella) beharensis* and *Acmaeoderella*, male genitalia.

notch on the epipleura, the lack of secondary sexual characters in females, the surface sculpture and other characters. The similarity in the comparative morphological series of the genitalia probably arose as a result of parallel evolution. Members of the new genus are distinguished from other taxa of the tribe Acmaeoderini by genital structure, the sculpture of the pronotum and the shape of the claws. Owing to the poor state of investigation of members of the subgenus we shall confine ourselves to an indication of the species groups.

koenigi Group

Volkovich, 1978: 34.

Lateral margins of clypeus strongly angularly broadened (Fig. 24). Body flattened, with very weak dorsal inflection. Prothorax covered with umbilicate punctures, sometimes giving way to fine longitudinal cicatrices. Iranian-Turanian subregion, Sethian region.

Composition: *X. koenigi*, *X. subscalaris*, *X. steinbergi*, *X. chivensis*.

flavipennis Group

Lateral margins of clypeus pointed (Fig. 25). Body usually with strong dorsal inflection (Figs. 10, 11). Pronotum covered with fine concentric grooves. Saharabian subregion, Sethian region, Ethiopian Kingdom.

Composition: *X. flavipennis*, *X. straminea*, *X. philistina*.

Holm (1978) regards *X. straminea* as a subspecies of *X. flavipennis*, but these forms are independent species by genital structure.

fasciata Group

Lateral margins of clypeus pointed (Fig. 25). Body with barely perceptible dorsal inflection. Sides of pronotum covered with cells, disc with raduliform punctures. Ethiopian Kingdom.

Composition: *X. fasciata*.

Genus ACMAEODERELLA

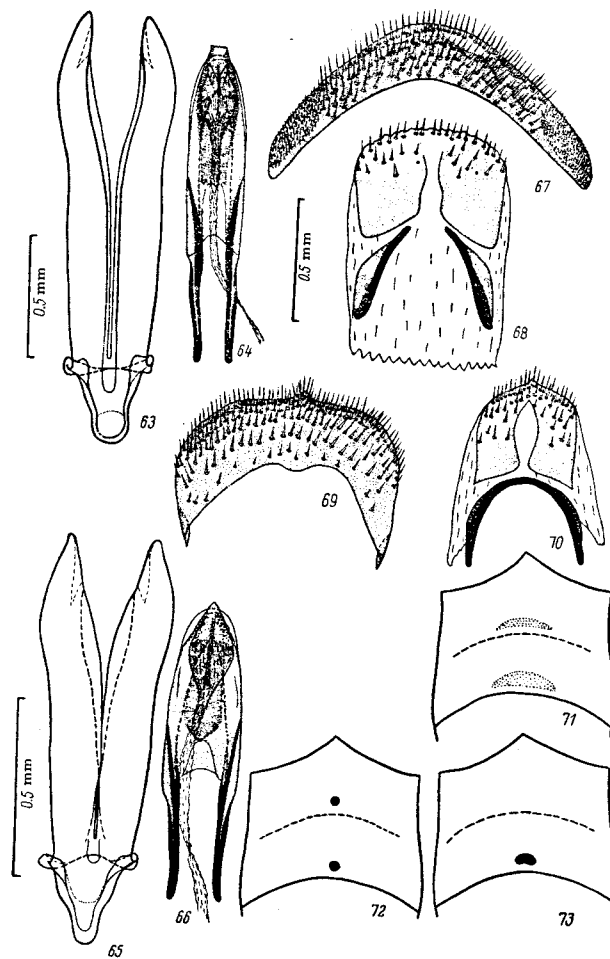
Cobos, 1955: 5.

Aedeagus depicted in Figs. 53-66; apodeme of tegmen broad; penis strongly sclerotized, inner folds merging apically, forming a cone; lamina large, apophyses long, differentiated; 8th sternite uniformly sclerotized and colored (Fig. 69), apophyses of 9th tergite fused (Fig. 70). Ovipositor depicted in Figs. 79-84, tubular, its length varying greatly from species to species; highly specialized forms are found; *A. insueta* has a strongly modified urite-like ovipositor (Volkovich, 1977b). Body terete, usually with strong dorsal inflection (Fig. 11), less frequently without. Clypeus greatly reduced (Fig. 23). Sexual dimorphism often manifested in antennal structure. Shape and sculpture of pronotum highly variable; the pronotum may have umbilicate and simple punctures or cells; a combination of all these elements is often to be seen. Mesepimera completely reduced. Hypomeres with curved posterior margins. Epipleura of elytra with a strong and deep notch (Fig. 8); lateral margin with barely perceptible teeth. Hind coxae without teeth on outer margin. Tarsal claws bearing teeth (Figs. 16, 17), less frequently simple (Fig. 19). Color highly variable; unicolorous dark aberrations are found in many species with markings on the elytra. Markings usually consisting of irregular merging yellow or orange spots, stripes and bands; unicolorous aberrations are black or black-bronze. Species of the subgenus *Euacmaeoderella* are typically copper-bronze, bronze, copper-red or blue with a strong metallic luster; such structural coloration is also highly variable. The pubescence consists of scales of various shapes, sometimes mingled with setae; in some species the scales completely cover the body surface. Canaries Province, Makaronesian subregion; Mediterranean subregion, Hesperian region; Sethian region (except for the greater part of the Central Asian subregion); some species penetrate into the European and Scythian regions.

Type-species of genus, *Buprestis discoidea*.

Subgenus LIOGASTRIA

Aedeagus depicted in Figs. 61, 62; parameres sometimes broadened in anterior half; apophyses of penis relatively short. Ovipositor depicted in Fig. 62; styli usually widely



Figs. 63-73. Acmaeoderini, structural details.

63-66) *Acmaeoderella (Euacmaeoderella)*, male genitalia: 63-64) *A. strandi* [63) tegmen; 64) penis]; 65-66) *A. nivefera* [65) tegmen; 66) penis]; 67-70) terminal abdominal segments: 67-68) *Acmaeodera (Acmaeodera) babatauensis* [67) 8th sternite; 68) 9th tergite]; 69-70) *Acmaeoderella (Euacmaeoderella) subcyanea* [69) 8th sternite; 70) 9th tergite]; 71-73) *Acmaeoderella (Acmaeoderella)*, shape of finely punctate spots on surface of 1st and 2nd apparent abdominal sternites: 71) *A. discoidea*; 72) *A. fulvinaeva*; 73) *A. oresitropha*.

separated, ventral hemisternites not reaching distal end of ovipositor. Body squat, with or without a slight dorsal inflection. Sexual dimorphism is prominently expressed in antennal structure. Pronotum without basal carinae, more or less transverse, covered

with cells or frequent simple punctures. Elytra with markings consisting of alternating light and dark stripes; we do not know of completely dark forms. Body with lanceolate scales not entirely covering the undersurface. First apparent abdominal sternites of female without clusters of small punctures or impressions in the middle. Claws simple or with a tooth. Canaries Province, Makaronesian subregion; Mediterranean subregion, Hesperian region; Kura-Araks and Levantine provinces, Iranian-Turanian subregion, Sethian region.

Type-species of subgenus, *Buprestis virgulata*.

Owing to the poor state of investigation of members of the subgenus we shall confine ourselves to its provisional division into two groups on the basis of claw structure.

virgulata Group

Tarsal claws with a basal tooth (Fig. 17).

Composition: *A. virgulata*, **A. rufomarginata*, *A. chrysanthemii*, *A. tonstrix*, **A. fossulicollis*, **A. rubrorinata*, *A. lucast*, *A. levantina*, **A. alesi*.

elegans Group

Tarsal claws simple (Fig. 19).

Composition: *A. elegans*, *A. maculipennis*, **A. cerastes*, **A. susica*, **A. chobauti*, *A. bolivari*, *A. miribella*, **A. vazquezi*, *A. confusissima*.

Subgenus *ACMAEODERELLA*

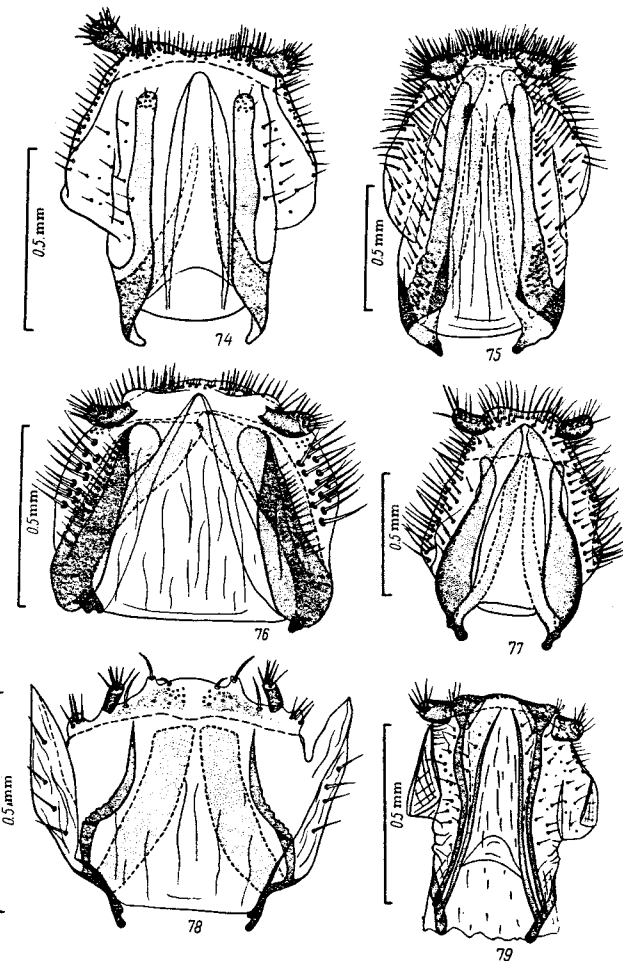
Aedeagus depicted in Figs. 59, 60 (see also: Cobos, 1958); apophyses of penis long. Ovipositor depicted in Fig. 83; styli converged, ventral hemisternites reaching distal end of ovipositor; features of specialization are to be seen in some species. Body squat, with weak dorsal inflection. Sexual dimorphism is prominently manifested in antennal structure. Pronotum without basal carinae, covered with cells and with simple punctures on disc. Markings consisting of alternating dark and light stripes; elytra often black or black-bronze, occasionally with steely luster. First apparent abdominal sternites of females bearing clusters of small punctures or small impressions (Figs. 71-73, 85); these formations differ in configuration and may serve as taxonomic characters; the scales covering the clusters are usually more frequent, reddish or slightly yellowish. Some species (*A. coarctata*, *A. hellenica*) lack these clusters. Tarsal claws toothed (Figs. 16, 17) or simple (Fig. 19); the tooth reaches the distal end of the claw in *A. abellei*, *A. seminata*, *A. coarctata* and *A. macedonica* males (Fig. 16). Body covered with lanceolate and oval scales, often concealing the undersurface. Mediterranean subregion, Hesperian region; Iranian-Turanian subregion, Sethian region.

Distinguished from the previous subgenus by genital structure and by the presence of secondary sexual characters in females. We here confine ourselves to enumerating the species in this subgenus.

Composition: *A. discoidea*, *A. coarctata*, *A. caspica*, *A. circassica*, *A. fulvinaeva*, *A. turanica*, *A. stricta*, *A. abellei*, *A. serricornis*, *A. seminata*, *A. moroderi*, *A. hellenica*, *A. erinaceiformis*, *A. trinacriae*, *A. oresitropha*, *A. elbursi*, **A. bodenheimeri*, *A. staneki*, *A. aramea*, **A. cercedillana*, **A. oliveirae*, *A. macedonica*, *A. plavilscikovi*, **A. cypriota*, *A. damasica*, *A. rudepilosa*, *A. stepaneki*, *A. beduina*.

Subgenus *OMPHALOTHORAX*

Aedeagus depicted in Figs. 57, 58 (see also: Cobos, 1958); parameres long and narrow; apophyses of penis relatively long. Ovipositor (Figs. 80, 81) tubular, greatly



Figs. 74-79. *Acmaeoderini*, ovipositors.

74-77) *Acmaeodera* (*Acmaeodera*): 74) *A. elater* (holotype, MNHNP); 75) *A. yunnana* (lectotype, MNHNP); 76) *A. edmundi*; 77) *A. semenovi* (holotype, NMP); 78) *Xantheremia straminea* (paratype, ZIN); 79) *Acmaeoderella* (*Euacmaeoderella*) *squammosa* (lectotype, MNHNP).

elongated. Elongate, terete; body slender, practically without a dorsal inflection. Sexual dimorphism is manifested in antennal structure in some species. Pronotum with weak carinae at base, distal ends of carinae located facing humeral calli; length of pronotum practically the same as its width; anterior part usually upraised (seen in profile); pronotum covered with coarse cells. Elytral markings consisting of random yellow spots, sometimes merging to form longitudinal and transverse stripes and bands; elytra less frequently yellowish, unicolorous. Scales lanceolate and oval, usually completely

covering abdomen. Claws with a basal tooth (Fig. 17) or simple (Fig. 19). Mediterranean subregion, Hesperian region; Sethian region.

Type-species of subgenus, *Buprestis adpersula*.

Composition: *A. adpersula*, *A. despecta*, *A. filiformis*, *A. longissima*, **A. pharao*, **A. polygonalis*.

Subgenus CARININOTA

Aedeagus depicted in Figs. 53-56 (see also: Volkovich, 1977b); apophyses of penis relatively long. Ovipositor tubular (Fig. 80), usually elongate (abbreviated in *A. zarudniana*); sometimes greatly modified (Fig. 84). Squat, broad, with weak dorsal inflection. Sexual dimorphism scarcely expressed in antennal structure. Base of pronotum with prominent carinae, the distal ends of which lie facing the 3rd and 4th elytral interspaces (carinae very weak in *A. dsungarica*); pronotum transverse, upraised in the middle or basally (seen in profile). Tarsal claws with a tooth (Fig. 17), less frequently simple (Fig. 19). Markings consisting of yellowish or reddish transverse bands and irregular spots; black aberrations are known in almost all species and are sometimes described as independent species or subspecies. Body covered with lanceolate and oval scales completely covering the undersurface; upper part of frons and vertex often bearing short setae. The entire range of the genus apart from the Makaronesian subregion.

Type-species of subgenus, *Buprestis flavofasciata*.

flavofasciata Group

Frons bearing umbilicate punctures; its upper surface, vertex and pronotal disc covered with erect scales, narrower than elsewhere on the surface, or setae; in *A. zarudniana* the scales are uniform and appressed. Ovipositor tubular (Figs. 80, 81), long, less frequently abbreviated. The entire range of the subgenus.

Composition: *A. flavofasciata*, *A. mimonti*, *A. farinosa*, *A. crucifera*, *A. zarudniana*.

glasunovi Group

Frons covered with rounded cells; head and pronotum with appressed white scales and without setae. Ovipositor strongly modified (Fig. 84). Iranian-Turanian subregion and Gobi Province, Central Asian subregion, Sethian region.

Composition: *A. glasunovi*, *A. albifrons*, *A. dsungarica*, *A. repetekensis*, *A. christophi*.

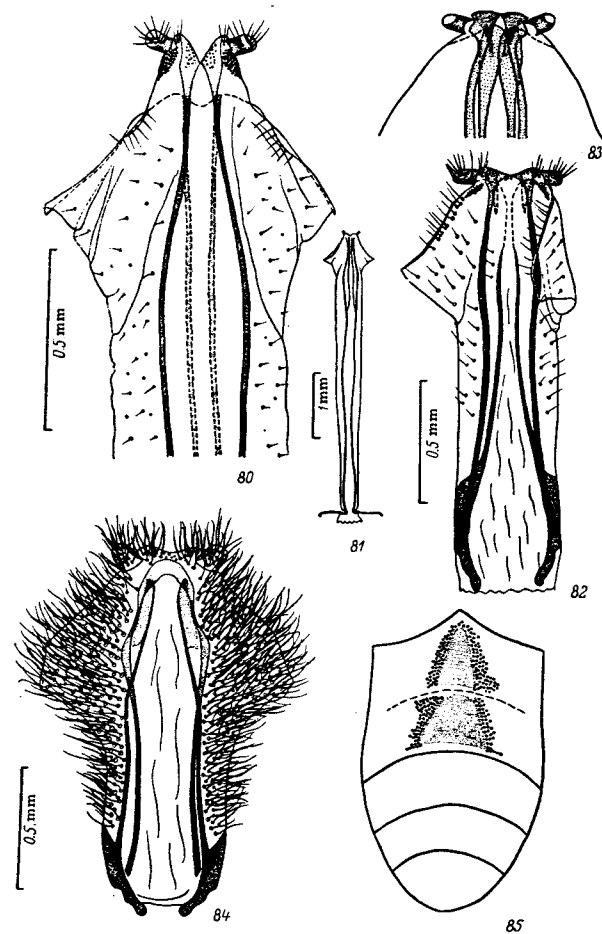
Subgenus EUACMAEODERELLA

Aedeagus depicted in Figs. 63-66; ovipositor in Fig. 79 (see also: Volkovich, 1976b), a more detailed account is given in the descriptions of the groups. Body broad, squat, with pronounced dorsal inflection (Fig. 11). Pronotum without carinae at base, transverse. Elytra usually with metallic luster, but black matt aberrations are known in the boryi group. Sculpture and pubescence highly variable. Tarsal claws with a tooth (Fig. 17), less frequently simple (Fig. 19). Mediterranean subregion, Hesperian region; Sethian region.

Type-species of subgenus, *Buprestis gibbulosa*

boryi Group

Elytra bronze or blue; in the latter case bronze and black aberrations are found. Pubescence consisting of long confused trichoid scales or hairs, at least on pronotum.



Figs. 80-85. *Acmaeoderella*.

80-84) Ovipositors: 80, 81) *A. (Omphalothorax) longissima* (= *A. amanicola*, holotype, MNHNP); 82) *A. (Liogastris) tonstrix* not shown); 84) *A. (Carininota) albifrons*; 85) *A. (Acmaeoderella) caspica*, shape of finely punctate spots on surface of 1st and 2nd apparent abdominal sternites of female.

Sexual dimorphism is often manifested in antennal structure. Sides and base of pronotum covered with cells, disc with fine punctures forming a transverse band in the middle of the pronotum; in this place the scales are more frequent than elsewhere on the surface, and erect. Aedeagus depicted in Figs. 63, 64 (see also: Volkovich, 1977b; Cobos, 1958); apophyses of penis long. Ovipositor tubular, elongate (Volkovich, 1977b). Mediterranean subregion, Hesperian region; Iranian-Turanian subregion, Sethian region.

Composition: A. lanuginosa, A. boryi, A. vetusta, A. mauritanica, *A. olivacea, A. theryana, A. henoni, A. judaeorum, *A. andresi, A. chusistanica, *A. antoinei, A. coelestina.

gibbulosa Group

Bronze, blue or violet. The pubescence consists of featherlike or lanceolate, less frequently trichoid scales, sometimes intermingled with setae (almost the entire surface of A. alepidota is covered with brownish setae). Sides and base of pronotum with shallow cells, remaining surface covered with simple punctures; surface of pronotum often strongly shagreened, other sculptural elements poorly apparent. The punctures do not form a transverse band, and the scales are uniformly distributed on the pronotum. Antennae short, practically the same in both sexes. Aedeagus depicted in Figs. 63-64 (see also: Volkovich, 1977b); ovipositor tubular, elongate; genital structure generally similar to that of members of the previous group. Mediterranean subregion, Hesperian region; Iranian-Turanian subregion, Sethian region.

Composition: A. gibbulosa, A. adamantina, A. vaulogeri, A. canescens, A. semi-olivacea, A. opacicollis, A. staudingeri, A. strandi, *A. corsica, A. dilatatisquamis, A. syrdarjensis, *A. noemi, A. alepidota.

dubia Group

Copper-red or bronze. Pubescence usually consisting of broad lanceolate, oval or rounded scales sometimes completely covering the surface of the body. Sculpture highly varied. Sexual dimorphism is manifested in antennal structure in some species. Aedeagus depicted in Figs. 65, 66 (see also: Volkovich, 1977b), apophyses short in most species; ovipositor tubular, rather short (Fig. 79), elongate in only a few species. Sethian region.

Composition: A. dubia, A. nivifera, A. personata, A. squamosa, A. xerxes, *A. alfierii, A. trаница, A. solskyi, *A. cheopis, *A. isis, A. leucotricha, A. richteri, A. nivetecta, A. insueta, A. valentinae, A. oblonga, A. candens.

Subgenus KOCHERIDIA

Cobos, 1958: 238.

Antennae 10-segmented, short, scarcely reaching upper eye margins. Head and pronotum with simple punctures and long trichoid scales. Genitalia not investigated. Mediterranean subregion, Hesperian region.

Type-species of subgenus, Acmaeodera trifoveolata.

Composition: A. trifoveolata.

Species incertae sedis: A. villosula, A. refleximargo, A. stumosa, A. angorana, A. maurorum, A. navasi.

Change of status: Acmaeodera planidorsis chalcithorax Obenberger, 1935 = A. chalcithorax; Acmaeodera undulata instabilis Cobos, 1966 = A. instabilis.

LITERATURE CITED

COBOS, A. 1955. Estudio sobre los Ptosimites de Ch. Kerremans (Coleoptera, Buprestidae). Bull. Inst. Sci. Nat. Belg. Brussels, 31 (13): 1-24.

COBOS, A. 1958. Revision de los Acmaeoderini de Marruecos (Col., Buprestidae). Eos, 39 (3): 221-268.

COBOS, A. 1956. Buprestidos recogidos por el Sr. J. Klapperich en el Afganistán. Annal. Hist.-Nat. Mus. Nat. Hung., Pars. Zool., 58: 305-323.

ESCHSCHOLTZ, F. 1829. Zoologischer Atlas, enthaltend Abbildungen und Beschreibungen neuer Thierarten, während des Flottcapitains von Kotzebue zweiter Reise um die Welt auf der russisch-kaiserl. Kriegsschlupp Predpiaetié in den Jahren 1823-1826. Berlin, 1 (8): 1-17.

FALL, H.C. 1899. Synopsis of the species of Acmaeodera of America, north of Mexico. J.N. York Ent. Soc., 7: 1-36.

HOLM, E. 1978. Monograph of the genus Acmaeodera Eschscholtz (Coleoptera: Buprestidae) of Africa south of the Sahara. Ent. Mem., 47, Pretoria: 1-210.

HORN, G.H. 1878. Revision of the species Acmaeodera of the United States. Trans. Amer. Ent. Soc., 7: 2-27.

KERREMANS, CH. 1906. Monographie des Buprestides. 2. London-Brussels-Berlin: 1-623.

MARSEUL, S.A. 1865. Monographie des Buprestides famille des Sternoxes de Latreille. L'Abeille, 2: 1-540.

MATEU, J. 1972. Les Insectes xylophages des Acacia dans les regions sahariennes. Porto: 1-714.

OBNENBERGER, J. 1935. Dvè novè formy rodu Acmaeodera (Col., Bupr.). Acta soc. Ent. Csl., 32: 202.

OBNENBERGER, J. 1956. Sur les relations entre les Buprestides de la région pale-arctique et néarctique. Proc. 10th. Int. Congr. Ent. Montréal, 1: 213-216.

SCHNEIDER, P. 1978. Die flug- und faltungstypen der Käfer (Coleoptera). Zool., Jahrb., Abt. 2, 99 (2): 174-210.

VAVILOV, N.I. 1968. The law of homologous series in hereditary variability. In: Classics of Soviet genetics, 1920-1940. Leningrad: 9-50.

VOLKOVICH, (VOLKOVITSH), M.G. 1976a. The tribe Acmaeoderini (Coleoptera, Buprestidae) in Mongolia. In: Insects of Mongolia, 4: 198-201.

VOLKOVICH (VOLKOVITSH), M.G. 1976b. New species of the genus Acmaeoderella Cobos (Coleoptera, Buprestidae) from Soviet Central Asia. Entom. obozr., 55 (3): 637-641.

VOLKOVICH (VOLKOVITSH), M.G. 1977a. On the synonymy of Palearctic buprestids of the tribe Acmaeoderini (Coleoptera, Buprestidae). Entom., obozr., 56 (4): 805-814.

VOLKOVICH (VOLKOVITSH), M.G. 1977b. New species of the tribe Acmaeoderini (Coleoptera, Buprestidae) from the USSR and Iran. In: Insect Systematics and Faunistics. Leningrad: 42-64.

VOLKOVICH (VOLKOVITSH), M.G. 1978. A revision of members of the Acmaeodera koenigi Ganglb. group (Coleoptera, Buprestidae) from Soviet Central Asia and a description of new species. In: New insect species of Soviet Central Asia and Kazakhstan. Tr. Zool. inst. AN SSSR, 71: 34-41.

YEMEL'YANOV, A.F. 1974. Proposals on the classification and nomenclature of ranges. 53 (3): 497-522.

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