

## New taxa of beetles (Insecta, Coleoptera) from Lebanese amber with evolutionary and systematic comments

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### ABSTRACT

The paper deals with description of new taxa from Lebanese amber dated within the late Barremian to lowermost Aptian. They are *Cretomalthus acracrowsonorum* gen. et sp. n. from the family Micromalthidae (Archostemata); *Eoclambus rugidorsum* gen. et sp. nov. from the family Clambidae; *Elodophthalmus harmonicus* gen. et sp. nov. and *E. gracilis* gen. et sp. nov. from the family Elodophthalmidae fam. nov.; *Lebanophytum excellens* gen. et sp.n. from the family Cerophytidae; *Lebanoretetes andelmani* gen. et sp. nov. from the family Kateretidae; *Tetrameropsis mesozoica* gen. et sp. nov. from the family Latridiidae (Tetrameropsinae subfam. nov.); and *Camelomorpha longicervix* gen. et sp. nov. from the family Anthicidae (Camelomorphini tribe. nov. in the subfamily Macratriinae). A review of the composition of coleopterous families revealed in Lebanese amber is given. Systematic position and probable bionomy of all considered groups are considered. Some conclusions on evolution of the order are made on base of new data from Lebanese amber.

**KEY WORDS:** Coleoptera. Archostemata. Polyphaga. New family. New subfamily. New tribe. New genera. New species. Lower Cretaceous. Lebanese Amber.

### INTRODUCTION

Amber is very important for palaeontologists because it contains a variety of biological inclusions in pristine, three dimensional condition. Till present day the oldest amber with many biological inclusions is from Lebanon (Azar 1997). More than 275 outcrops have been discovered after recent geological field searches made by one of us (D. Azar) during the last decade, which allowed to realize the map of distribution of amber deposits in Lebanon (Azar et al. 2003a: 394). Curiously, only 16 outcrops yielded biological inclusions. Lebanese amber ranges from the Late Jurassic to Cenomanian in age. The fossiliferous outcrops are all approximately of the same age and are mainly late Barremian to lowermost Aptian (Azar et al. 2003a). The precise dating of the Lebanese material was possible after the discovery of stratigraphical marker fossil pollen trapped in the amber (Dejax, pers. comm.).

For the majority of amber outcrops in Lebanon, the amber is found in its primary deposits. The material studied herein comes from Jouar Ess-Souss (known as Jezzine outcrop), Southern Lebanon; Homsiyeh-Aazour-Room deposit, Southern Lebanon; Kefar Selouane deposit, Central Lebanon; and mostly from Mdeyrij-Hammana deposit, Central Lebanon. The material has been prepared (cut and polished), then included in Canada balsam medium between two glass cover slips as described by Azar et al. (2003b: 118); or in a glass cube made by cover slips.

The Coleoptera from Lebanese amber were first recorded by R.A. Crowson (1981: 668) who found Micromalthidae, Scydmaenidae, Elateridae, Dermestidae as well as “a very remarkable Scarabaeoid type”, “Clavicorn type possibly of Pharaxonothini” and “two small Heteromera”. After this publication, the “Lebanese” Coleoptera were mentioned in the book by G. Poinar (1992: Micromalthidae, Staphylinidae, Scydmaenidae, Scarabaeidae, Dermestidae, Boganiidae) and in the book by D. Grimaldi & M.S. Engel (2005: Micromalthidae, Staphylinidae, Elateridae, Aderidae, Nemonychidae). Kuschel and Poinar (1993) described *Libanorhinus succinus* (Nemonychidae) and Lefebvre et al. (2005) described *Libanoeuaethetus pentatarsus* (Staphylinidae). Recently Kirejtshuk et al. (2008) published the description of a new tribe of the subfamily Scolytinae (Curculionidae) (Kirejtshuk et al. in press), and also F.-T. Krell, A. Ballerio, R.T. Buckley and D. Azar prepared a paper with the description of a new family of Scarabaeoidea (Krell, pers. comm.). The present publication is the fourth (or fifth) dealing with Lebanese amber Coleoptera.

The “fauna” of coleopterous inclusions obtained from few outcrops of Lebanon consists of about 100 specimens of different safety, all of which have a more or less comparable age and the palynological studies indicate a humid and hot climate in a dense tropical forest (Azar et al. 2003a). 56 specimens of 84 from Lebanese amber have been studied recently. A quite characteristic feature

of these inclusions is their body size (in most cases it is within 1.0 and 2.0 mm). Among the specimens temporally deposited in the Paris museum (Muséum National d'Histoire Naturelle) and available for this study there are found the families Micromalthidae Barber, 1913 (1 specimen), Carabidae Latreille, 1802 (1 specimen), Staphylinidae Latreille, 1802 (6 specimens), Scydmaenidae Leach, 1815 (1 specimen), Ptiliidae Heer, 1843 (1 specimen), new family of Scarabaeoidea Latreille, 1802 (4 or 5 specimens) (Krell et al. in preparation), Scirtidae Fleming, 1821 (2 specimens), Elodophthalmidae fam. nov. (2 specimens), Clambidae Fischer, 1821 (2 specimens), Elateridae Leach, 1815 (3 specimens), Throscidae Laporte, 1840 (1 specimen), Eucnemidae Eschscholtz, 1829 (1 specimen), Cerophytidae Latreille, 1834 (1 specimen), Ptilodactylidae Laporte, 1836 (1 specimen), Chelonariidae Blanchard, 1845 (1 specimen), Lymexylidae Fleming, 1821 (1 specimen), Dermestidae Latreille, 1807 (1 specimen), Melyridae Leach, 1815 (1 specimen), ? Phloeostichidae Reitter, 1911 (2 specimens); ? Boganiidae Sen Gupta et Crowson, 1966 (2 specimens), Kateretidae Erichson, 1843 (1 specimen), Monotomidae Laporte, 1840 (2 specimens), ? Biphylidae LeConte, 1861 (1 specimen), ? Cryptophagidae Kirby, 1837 (1 specimen), Silvanidae Kirby, 1837 (1 specimen), Latriidae Erichson, 1832 (1 specimen), Melandryidae Leach, 1815 (1 specimen), Scaptiidae Mulsant, 1856 (1 specimen), Aderidae Winkler, 1927 (6 specimens), Anthicidae Latreille, 1819 (1 specimen), Scolytidae Latreille, 1804 (1 specimen) and 3 specimens of the superfamily Cucujoidea which are needed in a proposal of new taxa of the family rank. In most cases if the attribution of the family looks like quite evident, the examined forms are quite different from recent groups, although not infrequently any of these forms should be regarded as an isolated genus inside well-defined subfamilies scoping both extant and extinct species (like *Cretomalthus acracrowsonorum* gen. et sp. nov. and *Eoclambus rugidorsum* gen. et sp. nov.). At the same time few forms with a more or less clear family attribution are so outstanding that it does not look advisable to consider them as the same taxa where the family members from the recent fauna are put. These forms are here described as new (Elodophthalmidae fam. nov., Tetrameropsinae subfam. nov., Camelomorphi tribe nov.). Besides, some inclusions show so unusual combination of characters that their family attribution seems to be not quite clear and a further study and elaboration of some new interpretations for groups of the superfamily Cucujoidea Latreille, 1802 are needed.

The authors encouraged D. Telnov to make a principal contribution in preparation of the diagnosis for *Camelomorpha longicervix* gen. et sp. nov. To recognize his efforts in this work the authorship for this form is shared with the mentioned expert. The authors are responsible for the rest taxonomical names in this paper and in the most cases the authors own names (Kirejtshuk and Azar) are omitted after the names of taxa, while for *Camelomorpha longicervix* gen. et sp. nov. all persons contributed are listed after main writing of taxonomic names Camelomorphi trib. nov., *Camelomorpha* gen. nov. and *C. longicervix* gen. et sp. nov.

The material under consideration is temporally deposited in the Laboratoire de Paléontologie, Muséum National d'Histoire Naturelle, Paris, waiting the creation of a national natural history museum in Lebanon.

## SYSTEMATIC PALAEONTOLOGY

Suborder: Archostemata Kolbe, 1908

Family: Micromalthidae Barber, 1913

The larva here described as a new species and new genus was known from the first publication on Coleoptera from Lebanese amber (Crowson 1981), where it was mentioned as a member of the genus *Micromalthus* Leconte, 1878 without description. Later D. Grimaldi & M.S. Engel (2005) published the pictures of this specimen (p. 365) also without description and proposal of a taxonomic name for it. This family till the recent studies was considered as represented in the recent fauna only by one species (*M. debilis* Leconte, 1878), although the presence of the genus in Oligocene-Miocene Mexican (Rosen 1971) and Dominican (Poinar 1992; Poinar & Poinar 1999) amber is recorded. Recently the second species of this genus was described from the Lowermost Eocene French amber (Kirejtshuk et al. in press b). Thus, it is possible to claim that family Micromalthidae appeared at least not later than the Lower Cretaceous and the genus *Micromalthus* – not later than Early Eocene, although some specimens of this family from the Upper Jurassic deposits of Karatau are waiting for a study and description. Thus, the family seemed to originate at least during the Jurassic.

**Remarks.** The genus *Micromalthus* Leconte, 1878 was proposed in the composition of the family Lymexylidae, then Barber (1913) erected for it a separate family near Lymexilydae, but after publication of Forbes (1926) this family is usually treated among the suborder Archostemata. Nevertheless, this position of this group has been frequently discussed and up to now it is not quite clear relation of this family with other groups. Some authors considered that it could be interpreted with some more relationship to the suborder Myxophaga (Ponomarenko 1969) or Polyphaga [for example, superfamily Canthoroidea: Arnett 1963; Lymexyloidea: Barlet 1996 (see also Machatschke 1962 etc.)]. Perhaps, peculiarities of the larval structures are scarcely very reliable for phylogenetic interpretation because of a more evolutionary plasticity of larval structures in general, although their peculiarities can provide with additional support to a certain viewpoint. In particular, the peculiarities of its mouthparts (instead of lack of maxillary lobes) and male genitalia of adults seem to give a more obvious indication on the phyletic affinity of this family to Archostemata rather than other characters and can support a more or less clear relation of it to other coleopterous groups. Nevertheless, the larval structures of *Micromalthus* are also in accordance with those in other recent groups of Archostemata (Grebennikov 2004). Recorded frequency of occurrence of larvae of this genus (family) in amber (see above) can be explained that the bionomy of both active stages of the species of this family seemed always to be

associated with wood (as it is characteristic of the recent representative of it).

**Discussion.** The family Micromalthidae spreads in time within the Aptian and Recent epoch. The rest groups of Archostemata sensu stricto (without characteristic Palaeozoic groups) are represented by the following families: Triadocupedidae Ponomarenko, 1966; Cupedidae Laporte, 1836; and Jurodidae Ponomarenko, 1985 appeared in fossil records in the Triassic (Triadocupedidae, Cupedidae) and Jurassic (Jurodidae), Crowsoniellidae Iablokoff-Khnzorian, 1983 proposed in composition of the suborder Archostemata should be transferred into the suborder Polyphaga, among groups of the superfamily Cucujoidea (Kirejtshuk et al. in press a). The suborder Archostemata includes the most number of rather old genera (genera *Omma* Newman, 1839 and *Tetraphalerus* Waterhouse, 1901 from Jurassic, and *Priacma* Leconte, 1861 from Cretaceous). At the same time this suborder has many extinct genera not extended beyond the Mesozoic (Ponomarenko & Kirejtshuk 2008), but genus *Cupes* Fabricius, 1801 in fossil records does not cross the boundary between Caenozoic and Mesozoic (Kirejtshuk 2005; Kirejtshuk et al. in press b). The relation of Micromalthidae with other coleopterous groups always was unclear. Although it is usually thought that they belong to the suborder Archostemata, they have many peculiar features allowing to doubt in such attribution (Ponomarenko 1969, 2001; Kirejtshuk 1991; Barlet 1996 etc.) and, probably the situation is rather far to be regarded as completely solved.

The larvae of Archostemata (Grebennikov 2004) are markedly less variable than adults (Neboiss 1984 etc.). It gives a reason to erect a new genus for the new species of this family which is here described after study of the larva. If larvae of recent and Cretaceous species are so different (see above), supposition on a rather great number of differences between adults can be regarded as enough substantiated. The sharp distinction in structure of the larval epicranium between species of *Micromalthus* and *Cretomalthus* gen. nov. makes possible to suppose some difference in the substrates, usual for these groups. The well developed endocarina of the head of the larva here described could be explained by inhabitation of it inside a very thick (high density) substrate and by presence of strong development of cranial musculature. Thus, it could prefer to live in hard wood rather than under bark as recent *Micromalthus debilis* Leconte, 1878 (more probably like larva of recent *Rhipsideigma* Neboiss, 1984).

#### GENUS: *Cretomalthus* gen. nov.

Type species: *Cretomalthus acracrowsonorum* gen. et sp. nov.

**Etymology.** The name of this new genus is formed from the term “Cretaceous” and second root of the member of the family, Micromalthus; gender masculine.

**Notes.** This genus is represented by the only species, and therefore the description of it overlaps with the description of species (“*descriptio generica specifica*”).

**Diagnosis.** From the “caraboid” or “triunguline” larva of the genus *Micromalthus* Leconte, 1878 (Grebennikov 2004) the type specimen of this new genus differs in the distinct endocarina, two well expressed stemmata on each sides, markedly longer and thinner labial and maxillary palpomeres, unraised sensory lobe of penultimate antennomere, 6 deep and distinct oval fossae along the posterior edge of abdominal sternum 5 corresponding with placements of setae, about 8 (8 or less) oval depressions along abdominal sterna, ultimate segment of all legs not very thin and about 1.5 times as long as penultimate one, lack of ventral sclerotized process of the penultimate abdominal segment. Other peculiarities of the form here described are following: prementum with a pairs close membranous bulbs at its edge, ultimate sternite as membranous as previous ones, with membranous and somewhat projecting apex (“ventral process”), on each side with a papulous swelling before apex.

The larva of this new species is very different from that of extant representative and, therefore, it is admitted that the adults of the Cretaceous species is also rather different from adults of both *Micromalthus debilis* and *M. sp.* from the Lowermost Eocene French amber. Thus, proposal of a new genus for the described larva seems to be quite reasonable.

#### *Cretomalthus acracrowsonorum* gen. et sp. nov.

Figures 1-5; Plate 1, figures A-F.

**Etymology.** The species epithet is devoted to both Prof. Aftim Acra (who deceased recently in April 2007) who collected the holotype of this species and constituted with his son Fadi the largest collection of Lebanese amber from Jezzine outcrop, and also to Prof. Roy Albert Crowson, one of greatest coleopterists of XX century, who identified this inclusion as a member of Micromalthidae (Crowson, 1981).

**Holotype.** Specimen no. “JS27”, Acra collection, housed provisionally in the Muséum National d’Histoire Naturelle, Paris. – [The complete specimen with clear integument in the very small subquadrate and very thin piece of amber (with length about 3 and width about 2 mm) is put in Canadian balsam between glass cover slips].

**Type locality and horizon.** Lower Cretaceous, Jouar Ess-Souss, Caza Jezzine, Mouhafazet Loubnan El-Janoubi (Southern Lebanon).

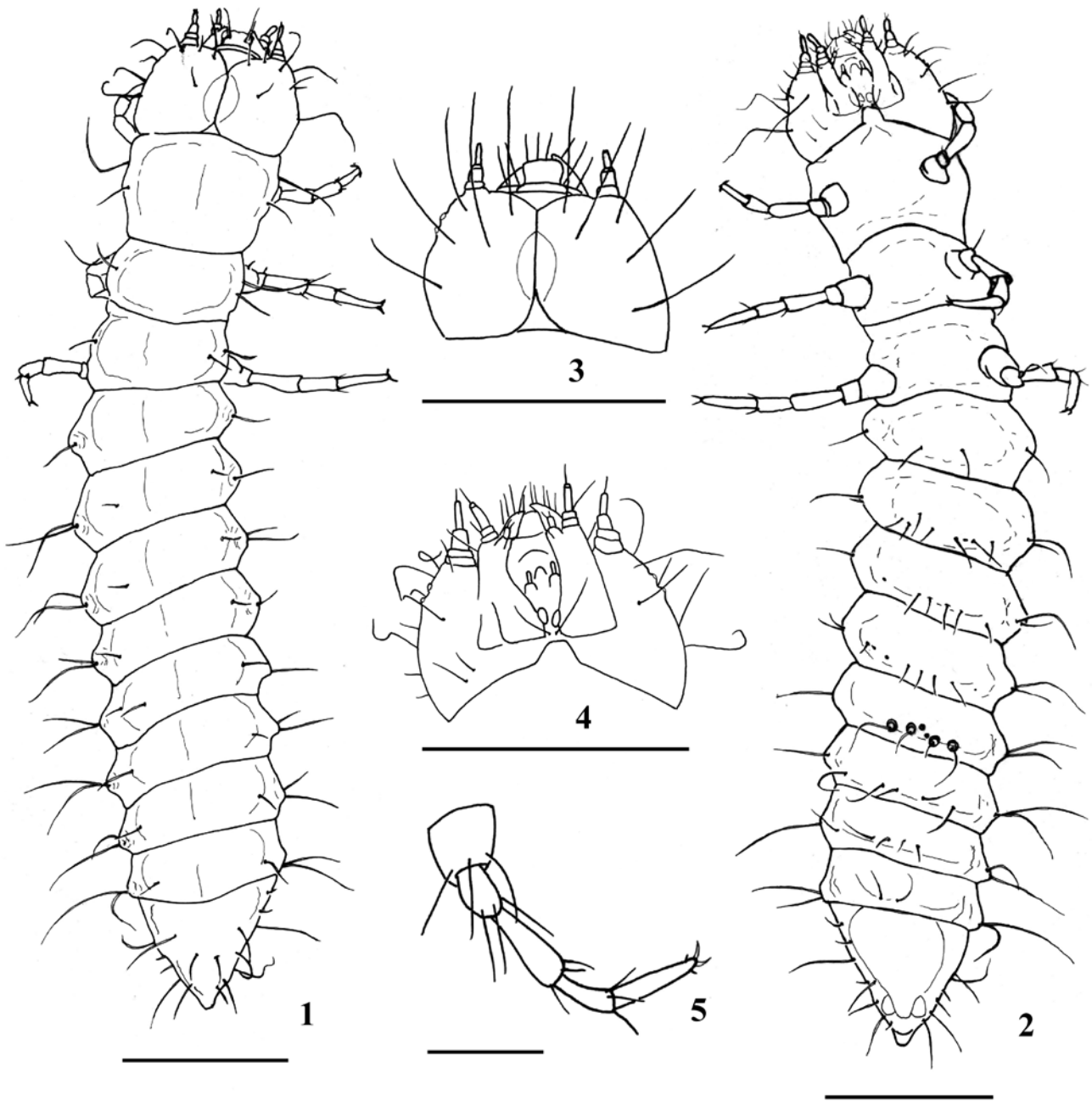
**Notes.** The amber specimen is well preserved and most structures are well visible, however, some setae probably are missing. In general larval chaetotaxy of *Cretomalthus* gen. nov. in topology and length is very similar to that in *Micromalthus* (according to the description by Grebennikov, 2004), although the number of setae on head and last abdominal segments of the specimen examined for this paper is clearly smaller.

**Description.** Length 1.5, breadth of head 0.3 mm. Elongate, subparallel-sided and slightly convex both dorsally and ventrally; very slightly sclerotized with sclerotized and reddish brown pigmented head with head appendages,

legs and marginal dorsal parts of last abdominal segment; with some sparse rather long setae on most sclerites.

Epicranium moderately depressed, slightly retracted into prothoracic segment, very distinct endocarina (forked both anteriorly and posteriorly); with two distinct tubercles (stemmata) on each side, disposed from antennal base at distance nearly subequal to that between antennal base and lateral edge of labrum; only with transverse frontoclypeal suture. Antennae 4-segmented, with short transverse antennomeres 1 and 2, somewhat elongate antennomere 3 without visible sensory appendix, and very narrow and

long antennomere 4, about as long as the rest antennomeres combined and with a long seta at apex. Labrum slightly widened apically, with transverse anterior edge bearing 4 setae, rounded anterior angles and about twice as wide as long. Only apex and outer edge of right mandible exposed dorsally. Maxilla moderately developed, with moderately raised galea with 2 setae and small membranous lacinia; palpomere 3 long and narrow, without setae, 3-4 times as long as thick and more than 1.5 times as long as strongly palpomeres 1 and 2 combined. Labium moderately developed, with a pair of small and narrow 1-segmented palpi;



Figures 1-5. Micromalthidae: *Cretomalthus acracrowsonorum* gen. et sp. nov.: 1 - body, dorsal; 2 - idem, ventral; 3 - head, dorsal; 4 - idem, ventral; 5 - anterior leg, dorsal. Scale bars for figures 1-4 - 0.3 mm; for to figure 5 - 0.05 mm.

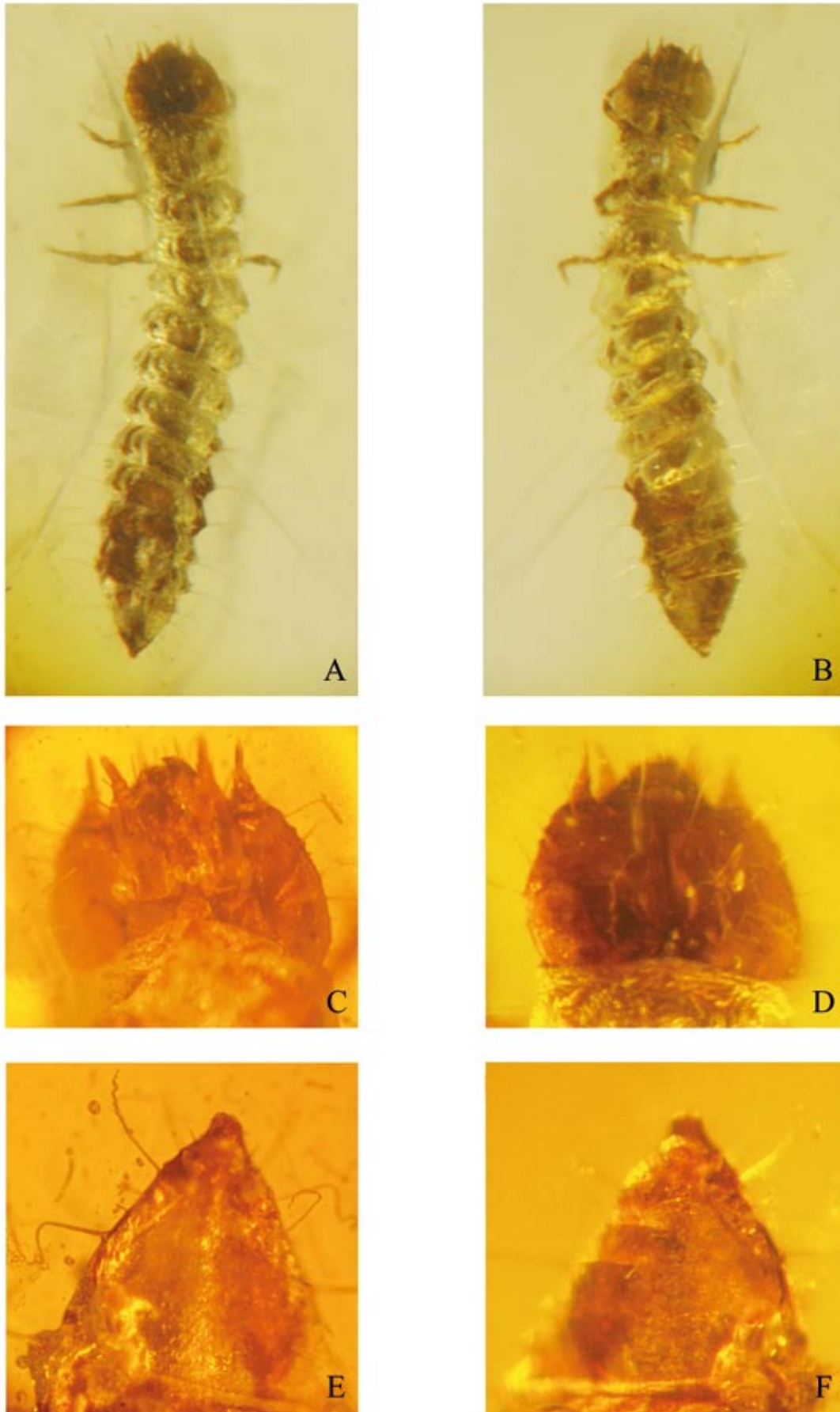


Plate 1. *Cretomalthus acracrowsonorum* gen. et sp. nov. (Micromalthidae): A – body, dorsal (length 1.5 mm); B – idem, ventral; C – head, dorsal (width 0.3 mm); D – idem, ventral; E – abdominal apex, dorsal; F – idem, ventral.

trapezium-like mentum very long and not separated from labium; gula at base with a pair of very long paramedian setae and at edge of prementum with a pair of close membranous "bulbs".

Terga evenly membranous and without any trace of sclerotization; prothorax with 2 lateral (pleural) setae on each side, somewhat more than 1.5 times as long as mesothorax and about twice as long as metathorax; meso- and metathorax with 2 lateral (pleural) setae on each side and a pair of paramedian setae at posterior edge; abdominal terga of abdominal segments 1-8 with 1 lateral (pleural) setae on each side and 6 setae along posterior edge, first 4 abdominal terga as long as mesosternum and terga of abdominal segments 5-8 somewhat shorter; ultimate tergum with a pair of paramedian setae in the middle and 3 setae along each side, its posterior edge before sclerotized apex also slightly sclerotized, apex slightly projecting and transversely abrupt.

Thoracic sterna without setae; prosternum with angularly convex anterior edge and medially vaulted before anterior legs; abdominal sternites of 1-8 segments with 8 setae along transverse line behind the middle edge; each of seta along posterior edge of abdominal sternite corresponding to a more or less expressed depression; sternite 5 with 6 sharply outlined fossae along the posterior edge (instead of depressions on the rest abdominal segments), each fossa demonstrating a distinct circle at bottom; ultimate sternite as membranous as previous ones and with somewhat projecting apex ("ventral process"), on each side with a papulous swelling before apex. Abdominal segment 10 invisible.

Legs as sclerotised as epicranium with similar shapes of sclerites, although intermediate leg slightly larger than anterior and slightly smaller than posterior ones. Coxae conical, widest at base, about twice as thick as femora and slightly shorter than femora with 3 subapical rather long setae. Trochanters subcylindrical, slightly thinner than femora and nearly half as long as femora with 2 subapical long setae. Femora subconical, widest at apex and with 3 subapical short setae. Tibiae subcylindrical to subconical, widest at apex, somewhat shorter than femora and with 3 subapical short setae. Tarsi subconical, widest at base, slightly thinner than tibiae, about 1.5 times as long as tibiae, probably with 3 very short and fine subapical setae (these setae clearly visible only on right posterior tarsus, but 1 or 2 setae traceable on the remainder) and with a pair thin and slightly curved claws.

Family: Clambidae Fischer, 1821

This family is represented in the recent fauna by five genera, one of them (*Clambus* Fischer, 1821) has a more or less subcosmopolitan range. It is usually regarded as consisted of three subfamilies, but the genus here considered should be put in the subfamily Clambinae according to the key elaborated by R.A. Crowson (1979). Recent members of the family are mycetophagus and some have been registered in association with Myxomycetes. The mentioned genus is recorded from Baltic amber (Klebs 1910; Bachofen-Echt

1949), but without any proper description. Nevertheless, this genus is not infrequent among the Baltic amber inclusions in different collections. The species here described is a first finding of this family in Mesozoic fossils.

Subfamily: Clambinae Fischer, 1821

GENUS: **Eoclambus** gen. nov.

Type species: *Eoclambus rugidorsum* gen. et sp. nov.

**Etymology.** This generic name consists of the Greek root "eos" (dawn) and "Clambus", generic names of close relatives in recent fauna; masculine gender.

**Diagnosis.** This new species is quite characteristic of the family Clambidae because of the quite peculiar structure of head and its appendages, deeply excavate mesosternum allowing the body to roll, short metaventrite with sloping anterior part, very large femoral plates of the metacoxae. It is distinct from all the recent members of the family in the very coarse microsculpture, distinct premetacoxal lines between outer angle of metacoxa and median part of anterior edge of the convex part of mesoventrite. Besides, it differs:

- from *Acalyptomerus asiaticus* Crowson, 1979 in the larger head with lateral surface of eyes divided by a fold of the frons (canthus), eyes not projecting laterally, much larger (longer and wider) and more convex pronotum, diffuse pubescence on elytra, short convex part of metaventrite, 10-segmented antennae with very elongate antennomeres 1, much longer femoral plates, 3-segmented tarsi;

- from species of *Sphaerotherax* Endrödy-Younga, 1959 in the lateral surface of eyes divided by a fold of the frons (canthus), short and denser hairs on dorsum, more broadly arcuate elytral apices, deeply concave anterior edge of convex part of metaventrite, very short pubescence and lack of long hairs on underside (species of *Sphaerotherax* have the particularly long and dense hairs along anterior edge of convex part of metaventrite and on abdominal ventrite 1 between metacoxae), more compact antennal club, more arcuate anterior edge of the frons, adsutural lines well expressed along the whole length, much shorter legs, absence of trace of epipleura [species of *Sphaerotherax* have the mesocoxal cavities distinctly separated, but somewhat more widely and flatly than those in *Eoclambus rugidorsum* gen. et sp. nov.];

- from species of *Clambus* Fischer de Waldheim, 1821 in the, less expressed median carina of mesoventrite, mesocoxal cavities distinctly separated (mesocoxae in are extremely narrowly separated, but not contiguous) [the genus *Clambus* is the most numerous and extremely diverse, but the most species of it have in contrast to *Eoclambus rugidorsum* gen. et sp. nov. the more widely arcuate posterior angles of pronotum, longer convex part of metaventrite, larger scutellum, adsutural lines expressed only in distal part of elytra, antennal insertion very frequently almost locked the inner expansion of frons];

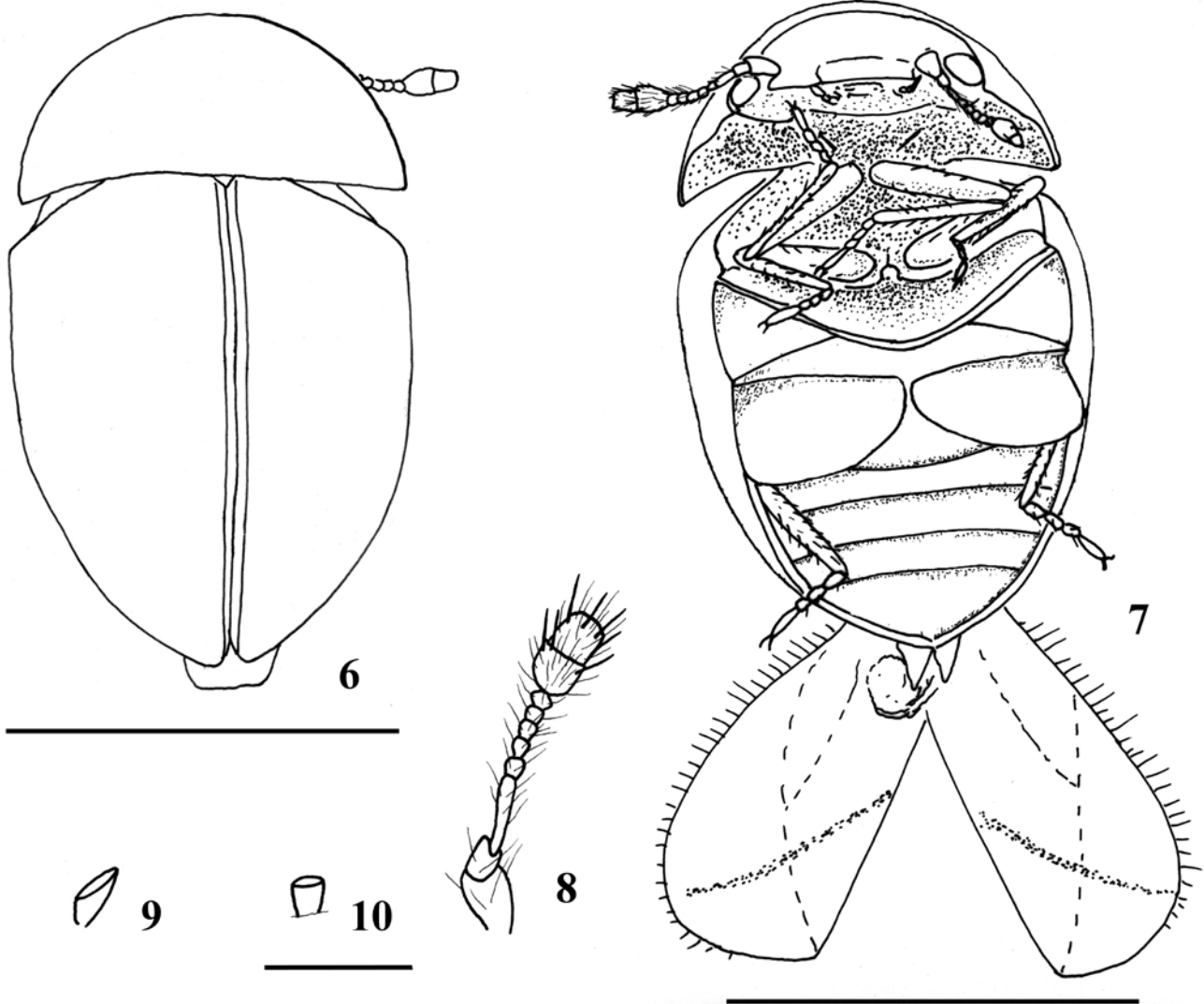
- from species of *Loricaster* Mulsant et Rey, 1861 in the larger and not so convex body with comparatively larger

head with not so wide antennal insertions and frons gently arcuate (not strongly projecting before subtruncate anterior edge), adsutural lines expressed along the whole length, much larger (wider and longer) pronotum with much longer lateral edge, convex part of metaventrite much shorter and its anterior edge distinctly concave, 5 abdominal ventrites [mesoventrite of *Loricaster testaceus* Mulsant et Rey, 1861) has not been studied];

- from species *Calyptomerus* Redtenbacher, 1847 in the more oval and less convex body with more broadly arcuate elytral apices, much longer pronotum with not angular sides and smaller head with lateral surface of eyes divided by a fold of the frons (canthus), adsutural lines expressed along the whole length, much longer convex part of metaventrite in the middle, larger and longer femoral plates of metacoxae, 5 abdominal ventrites, tibiae somewhat narrowing apically (but not widened as in *Calyptomerus dubius* Marsham, 1802) [mesoventrite of *Calyptomerus* has not been studied].

**Notes.** The descriptions, diagnoses and key to the members of this family (Crowson 1979; Endrödy-Younga 1981, 1993 etc.) formerly published are frequently not complete and contain some mistakes. Therefore it was necessary to elaborate a diagnosis of this fossil form to compare it with recent representatives of all the genera except *Acalyptomerus*, which was provided with a rather detailed comprehensive description.

**Discussion.** This genus is very similar to the many recent groups of the family Clambidae (all genera are listed above). At least this Lebanese genus is similar to the recent representatives of the family rather than other Lebanese genera to their recent relatives. Taking into consideration the bionomy of representatives of this family in recent ecosystems, it is thought that *Eoclambus rugidorsum* gen. et sp. nov. occurred in epigeal litter of the "Lebanese" forest and, because the Cretaceous form is not very different from recent ones, ecological circumstances of habits of



Figures 6-10. Clambidae: *Eoclambus rugidorsum* gen. et sp. nov.: 6 - body, dorsal; 7 - idem, ventral; 8 - antenna, dorsal; 9 - ultimate maxillary palpomere, ventral; 10 - ultimate labial palpomere, ventral. Scale bars for figures 6, 7 - 0.5 mm; for figures 8-10 - 0.1 mm.

both seem to be rather comparable in stead of a great time distance.

**Notes.** This genus is represented by the only species, and therefore the description of it overlaps with the description of species (“*descriptio generica specifica*”).

*Eoclambus rugidorsum* gen. et sp. nov.

Figures 6-10; Plate 2, figures A-C.

**Etymology.** The epithet of this new species is formed from the Latin “*ruga*” (groove, furrow, pinch) and “*dorsum*” (back, top, head, upper part; bonnet; hood).



Plate 2. Figures A-C. *Eoclambus rugidorsum* gen. et sp. nov. (Clambidae): A – body, dorsal (length 0.7 mm); B, C – idem, ventral. Figures D-E. *Elodophthalmus harmonicus* gen. et sp. nov. (Elodophthalmidae fam. nov.): D – body, laterodorsal (length 1.4 mm); E – idem, lateroventral.



**Holotype.** Specimen no. "752", male, Azar collection, housed provisionally in the Muséum National d'Histoire Naturelle, Paris [The rather clear complete beetle exposing elytral apices of both posterior wings with some gas layers and very small vesicles because of coarse microsculpture and pubescence on most sclerites, except mesoventrite, excavate part of metaventrite and appendages, is included in a small and thin quadrangular amber piece (with length about 3.0 and width 2.0 mm) with some cracks on the left side and behind the beetle. This piece is put between the glass slides with Canada balsam.].

**Paratype.** Specimen no. "90", sex indefinable, Azar collection, housed provisionally in the Muséum National d'Histoire Naturelle, Paris [The complete beetle surrounded by many small gas vesicles (particularly at the underside) is included in a small and thin irregular amber piece (with length about 3.5 and width 2.5 mm) with few small cracks and vesicles. This piece is put between the glass slides with Canada balsam.].

**Type locality and horizon.** Lower Cretaceous, Hammana/Mdeyrij, Caza Baabda, Mouhafazet Jabal Loubnan (Central Lebanon).

**Description.** Holotype: Length 0.7, width 0.5, height about 0.5 mm. Oval, strongly convex dorsally and moderately convex ventrally with strongly excavate mesoventrite and anterior part of metaventrite allowing the body rolling; blackish with chestnut dark brown appendages; mostly mat; dorsum with slightly conspicuous and fine greyish suberect hairs about 3 times as long as distance between their insertions, at antennal excisions with few much longer hairs; underside with somewhat shorter and mostly subrecumbent hairs, although on hypopygidium hairs somewhat suberect.

Head and pronotum with unclear puncturation with very coarse microsculpture and looking like coarsely microtuberculate. Elytra with dense and clear, irregular but mostly rather small punctures, microsculpture between them somewhat smoothed in comparison with that on head and pronotum, but remaining rather coarse and relief (without any shine). Distal part of metaventrite, femoral plates and abdominal ventrites as sculptured as elytra, metaventrite and femoral plates with more or less distinct punctures about as large as eye facets, interspaces between them about as great as a puncture diameter or greater, but abdominal ventrites without clear puncturation. Underside of head, prosternum and mesoventrite as well as anterior part of metaventrite rather smoothed, but without clear puncturation.

Head of usual subsemicircular shape with anterior edge gently arcuate, somewhat longer than distance between eyes, evenly convex, eyes small, finely faceted, temples continuing as a fold of frons separated dorsal and ventral parts of eyes (canthus), before eyes frons deeply and narrowly excised at antennal insertions (outline of excision strictly congruent with shape of scape and antennomere 2), anterior part of frons scarcely isolated. Labrum and mandibles not exposed from under frons and invisible. Antennae

10-segmented, moderately long, markedly shorter than head wide at eyes; scape somewhat elongate and dilated (apparently about twice as long as wide); antennomere 2 subtriangular, somewhat narrower than scape and about 2/5 as long as scape; antennomeres 3 very long and somewhat curved, almost as long as club, antennomeres 4-8 comparable in length and about 1/4 as long as antennomere 3; slightly compressed and subparallel-sided 2-segmented club with subabrupt apex comprising about 2/7 of total antennal length, with antennomere 9 slightly shorter and wider than antennomeres 10; antennomeres with very long and fine setae, but club in addition with few very thick and stout setae. Pronotum almost twice as wide as long, rather vaulted at disk and rather steeply sloping at sides; its anterior edge arcuately excised, posterior edge nearly straight when head declined, anterior angles nearly right and with rounded top, posterior angles very widely rounded, sides gently arcuate, edges not bordered. Scutellum rather small and subtriangular. Elytra almost 1 and 1/4 as long as wide combined, longest at suture and widest at shoulders, strongly convex and steeply sloping and somewhat declined on ventral sides (from below visible lateral sides which wider than distance between lateral edges), with weak shoulders, sutural lines well expressed along entire length and subparallel, their apices jointly subacuted, epipleura not expressed. Pygidium seems to be covered by elytral apices, but anal sclerite well exposed from under elytral apices, widely rounded to subtruncate at apex.

Eyes somewhat visible underside. Most part of head underside invisible clearly, but ultimate maxillary palpomere elongate with oblique apex and ultimate labial palpomere flattened, somewhat elongate and slightly widened apically. Prosternum very short. Procoxae strongly transverse and contiguous. Mesocoxae transverse and distinctly separated, mesoventrite between them distinctly elevated looking like a tubercle. Metaventrite divided into sloping anterior part and very short convex part at the same plane with abdominal ventrites, with distinct paracoxal lines before coxae. Metepisterna concealed by elytral sides and visible only at metacoxae. Metacoxae nearly contiguous with long femoral plates completely covering metafemora. Abdominal ventrite 1 about as long as hypopygidium and ventrites 2-4 with comparable length about 1/2 as long as ventrite 1 and hypopygidium taken separately; hypopygidium widely rounded at apex.

Legs well developed, quite narrow and long, although most sclerites invisible clearly. Tibiae comparable in length, about 5/7 as long as antennae, very thin and with long setae along their outer edge, slightly narrowing apically and without distinct spurs. Femora somewhat wider than tibiae (metafemora concealed by femoral plates). Tarsi about 3/4 as long as tibiae, with 4 simple tarsomeres bearing few long setae, tarsomere 1-3 comparable in length and tarsomere 4 about twice longer than each of previous ones; claws simple, very narrow and rather long.

Apical membranous parts of asymmetric aedeagus slightly exposed from under apex of hypopygidium.

**Variation.** The paratype is very similar to the holotype, although the most structures are less clear because of plenty of very small gas vesicles and a slight milky foggy cover along the dorsum.

Family: Elodophthalmidae fam. nov.

Type genus: *Elodophthalmus* gen. nov.

**Composition.** This new family is proposed for the only generic group consisting of two new species.

**Diagnosis.** The form described below has a very short prothorax and its head is certainly hypognathous. This as its general appearance apply to most Scirtoidea (Scirtidae, Decliniidae Nikitsky et al., 1994, Clambidae and Eucinetidae Lacordaire, 1857). However, the new species here described have very large and very coarsely faceted eyes. It looks somewhat like a member of Scirtidae or Decliniidae. Unfortunately, most of critical characters important for discrimination of these families are not accessible in the studied fossil specimens. In particular, the subgenal ridges, absence/presence of 8-th spiracles, type of aedeagus, wing venation etc. cannot be seen. Among the families of Scirtoidea the absence of the large femoral plates of this fossils put it away from Clambidae and Eucinetidae. Besides, it is impossible to link *Elodophthalmus* gen. nov. with the groups of Eucinetidae or Clambidae; with the first because of the short and (sub) transverse metacoxae, very narrow and rather long metepisterna, widely rounded posterior angles of the pronotum, long antennae and segments of legs with frequently simple and narrow tibiae; and with the latter because of the rather elongate body, narrow and projecting anteriorly head with very large eyes and without canthus (excision in frons for receiving of scape), not enlarged femoral plates (although in *Acalyptomerus* these plates are not as large and the metepisterna are rather narrow). *Elodophthalmus* gen. nov., in contrast to *Declinia* Nikitsky, Lawrence, Kirejtshuk et Gratshev, 1994, demonstrates the projecting frons of rather deflecting head, long antennae and very long tarsi with frequently simple tarsomeres, comparatively softer sculpture of the integument (particularly with diffuse and very fine puncturation on the elytra).

Thus the species of the genus *Elodophthalmus* gen. nov. show the most resemblance and probably has a more close relation to Scirtidae. Nevertheless, this new family differs also from the family Scirtidae (including Sinodryopitidae - see below) in the rather peculiar combination of characters, namely in the rather narrow metepisterna, very narrow epipleura, very large and emarginate at anterior edge eyes and simple to subconical tarsomeres 1-4. A tendency to weakening and reduction of epipleura and that for tarsi to become simple are known in Scirtidae, although their tarsomere 4 is always lobed. However, so large eyes with the emarginate anterior edge and simple tarsomere 4, as those in species of *Elodophthalmus* gen. nov., are unknown among Scirtidae. Besides, the mouthparts of the new fossil species are rather projecting posteriorly and this peculiarity is not characteristic of members of Scirtidae. In addition to the listed diagnostic characters, the species of *Elodophthalmus*

gen. nov. is characterized by the rather long elytra with well expressed adsutural lines, submesocoxal line reaching the middle of metepisternum, anterior part of head strongly projecting, pronotum with bordered edges, separated metacoxae and emarginate anterior edge of frons, comparatively narrow femora and tibiae without spur, antennae not very narrow with, compressed antennomeres 1 and 2 and enlarged ultimate antennomeres. It should be noted that the large head of the forms under consideration has very large eyes (coarsely faceted and emarginate at anterior edge) and protruding frons (head and eyes markedly larger than those in species of *Prionocyphon* Redtenbacher, 1858).

The head of species of *Elodophthalmus* gen. nov. is very declined and like that in species of Chelonariidae (superfamily Byrrhoidea Latreille, 1804), could not straighten out, although, in contrast to the latter, the body in species of *Elodophthalmus* gen. nov. is dorsoventrally not depressed and their mouthparts and not strongly projecting. Moreover, Chelonariidae, in contrast to the Scirtidae (Scirtoidea) in general, have more or less depressed oval body with sharply carinate sides, strongly declined and fixed opisthognathous head (not exposed from above, but able to turn forwards in the prognathous position), distinct cavities on the thoracic segments for reception of legs. Also, epipleura of Chelonariidae, in contrast to those in species of *Elodophthalmus* gen. nov., are yet more reduced to obsolete and tarsomere 3 with membranous appendages.

Thus the family Elodophthalmidae fam. nov. can be recognized as a fifth family member among the families of the superfamily Scirtoidea, which can be diagnosed by the elongate and convex body with steeply sloping sides, long elytra with diffuse puncturation, very large and coarsely faceted eyes emarginate at antennal insertion, long antennae with strongly modified (enlarged and flattened) antennomeres 6-10 or 7-10, long and narrow legs with simple tarsomeres (or protarsomeres 1-4 slightly lobed), narrow and long metepisterna, raised submesocoxal lines subrectilinearly deviating to the middle of metepisternum, short and slightly oblique metacoxae without femoral plate.

**Description.** Body small (0.8-1.2 mm). Elongate oval; dorsum with dense, erect, short and stout dark hairs; understide with dense and fine hairs; elytral sides at apices with fringe of hairs. Dorsum with distinct dense and moderately small punctures, interspaces between somewhat smoothed. Head oval and slightly exposed dorsally, convex at base and flattened in the most length, anterior edge of frons distinctly angularly excised; very coarsely faceted eyes with anterior edge distinctly sinuate at antennal insertion, base of head with a transverse border at anterior edge of pronotum. Labrum exposed. Mandibles small. Antennae 11-segmented, comparatively long and with rather modified antennomeres 6-10 or 7-10 and ultimate antennomere somewhat enlarged, scape subconical to subcylindrical, antennomeres covered with sparse and long hairs. Pronotum strongly transverse, vaulted at disk and rather steeply sloping at sides; its sides looking like a continuation of anterior and posterior edges meeting in an arc closer to anterior edge than posterior one, edges not borde-

red. Scutellum subtriangular. Elytra rather long, longest at suture and widest at shoulders, rather convex and steeply sloping and somewhat declined on ventral sides, adsutural lines well expressed along entire length and subparallel. Pygidium not exposed dorsally. Mesocoxae transverse and narrowly separated. Metaventrite medially convex, without paracoxal lines before metacoxae, its posterior edge between coxae angularly excised. Distance between metacoxae greater than that between mesocoxae. Metepisterna exposed along the whole length. Metacoxae moderately oblique, with scarcely expressed femoral plate. Abdomen with 5 ventrites. Epipleura extremely narrow and elevated laterally. Legs narrow and long. Trochanters of normal type. Tibiae slightly compressed, with very thin and with diffuse not long setae becoming more stout along truncate apex and with apparent spur scarcely differing from long setae. Femora of usual shape, rather narrow. Tarsi moderately long, with 5 simple tarsomeres or protarsi with slightly lobed tarsomeres 1-4, while meso- and metatarsomeres 1-4 narrow to subconical and very scarcely lobed beneath; tarsomeres with short and stout setae at apex; claws simple.

**Remarks.** Adults of the fossil species here described seemed to occur outside of water basins like recent representatives of Scirtidae and Decliniidae. The finding of one of them in the amber piece together with Psocoptera, which is in an immediate proximity to the beetle, gives some evidence of an association of the latter with forest ecological circumstances (or at least at the moment of capturing).

**Discussion.** The family Scirtidae have been recovered beginning from the Jurassic (see below). If this new fossil described as a member of new family is a derivative relative to this family, the appearance of it later than the appearance of the basal groups is quite logic. Considerable analogies in structural transformations between Chelonariidae (Byrrhoidea) and *Elodophthalmus* gen. nov., on the one hand, and between Chelonariidae and *Amplectopus* Sharp, 1886 (Lawrence & Newton 1995), on the other, makes possible to suppose some extent of close relation of these groups. The family Scirtidae in general is usually referred to as a rather archaic group similar to those which were at base of the Polyphagan diversifications in general (Forbes 1926; Crowson 1955; Kukalova-Peck & Lawrence 1993; Fedorenko 2002 etc.). It would be also possible to admit that the family Chelonariidae maintained a tendency in transformations of the head and thorax, which appeared in ancestors, probably rather similar and closely related to the members of Scirtidae. However, the latter family, instead of its association with reservoirs of water, well expressed ability to fly and great chances to be deposited in the lacustrine limestone, is still recorded not earlier than the Upper Jurassic, i.e. much later than some families from all infraorders of the suborder Polyphaga. Moreover, this tendency occurs also in other families of the superfamily Byrrhoidea (Lawrence et al. 1995), what could suppose their plesiotypic character. However, as in case with Scirtidae, the families of Byrrhoidea are also recorded in collections (not published) not earlier than the Upper Jurassic (Karatau).

The superfamily Scirtoidea is very frequently regarded as the most archaic group Elateriformia or Polyphaga in general. Its posterior wing venation is looking like a derivative from the basal Archostematan type (or rather Cupedid type according to comparison with recent members of the family), but in contrast to the remainder of the suborder Polyphaga, the wing folding of Scirtoidea maintains the Archostematan character (excluding rolling of the wing apex). Therefore some coleopterists consider the wing venation and folding as a separate type opposing the types in rest Polyphaga (Fedorenko 2006). If it can be treated as a quite reasonable, origin of the superfamily should be put close to the Triassic, but not Upper Jurassic (from where it was recorded in deposition). It is important to note that Jurodididae, at least recent *Sikhotealinia zhiltzovae* Lafer, 1996, have the propleuron between pronotum and prosternum invaginated inside prothoracic segment, as that in Decliniidae from Scirtoidea, and the wing of the recent representative of this Archostematan family also shows some reminiscence of those of Cupedidae and the Scirtoidea (Kirejtshuk & Fedorenko, in preparation). Summarizing these structural data the superfamily Scirtoidea is thought to maintain some plesiotypic features, which seem to be evidence of an early formation of Polyphaga, while in Jurodididae some transformations similar to those in Polyphaga can be traced as well.

GENUS: ***Elodophthalmus*** gen. nov.

Type species: *Elodophthalmus harmonicus* gen. et sp. nov.

**Composition.** Except the type species, the genus includes *E. gracilis* gen. et sp. nov.

**Notes.** This genus is represented by the only species, and therefore the description of it overlaps with the description of species (“*descriptio generica specifica*”).

**Etymology.** The name of this new genus is formed from the generic name *Elodes* and the Greek *ophthalmos* (“eye”); masculine gender.

***Elodophthalmus harmonicus*** gen. et sp. nov.

Figures 11-15; Plate 2, figures D-E.

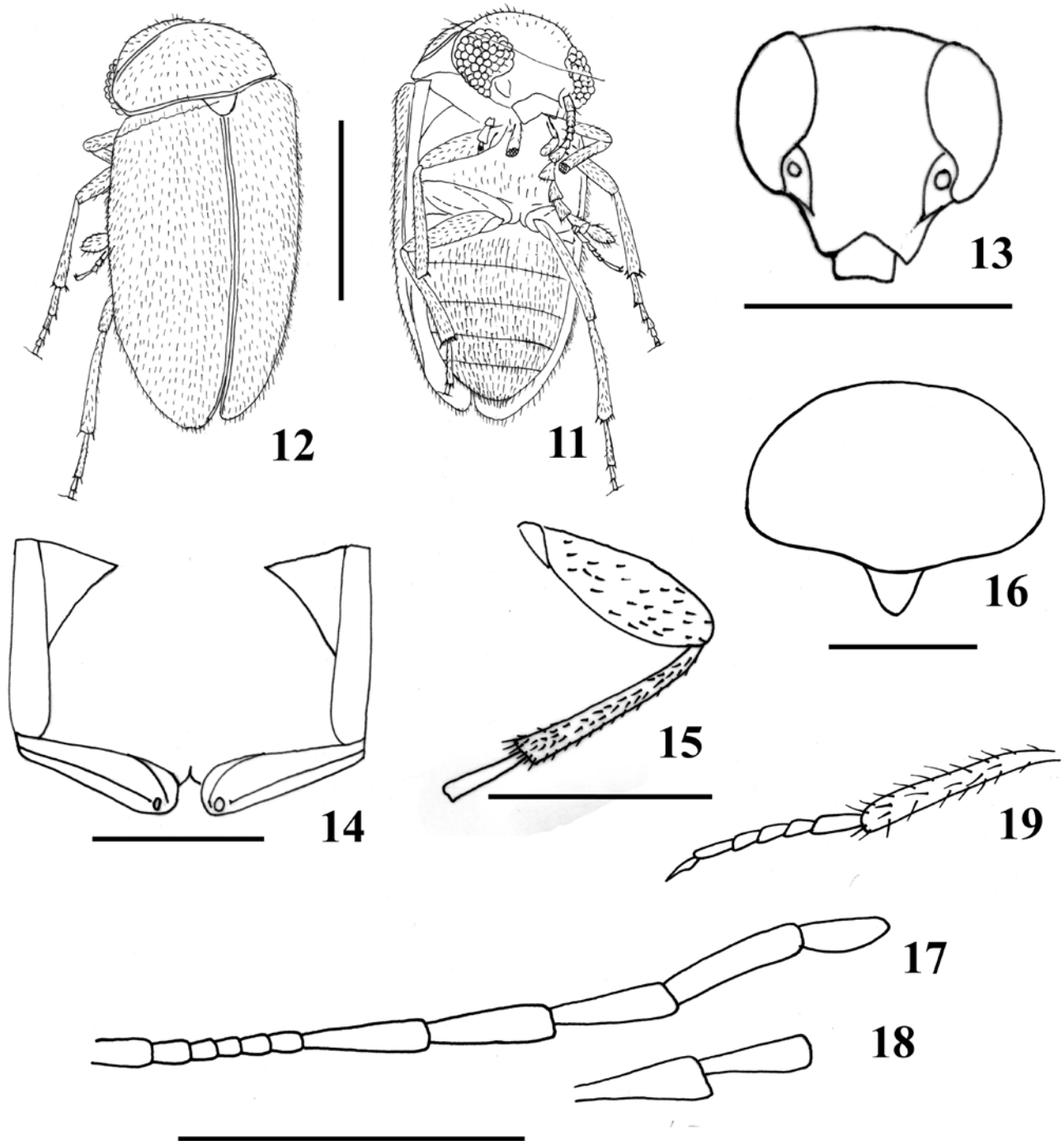
**Etymology.** The epithet of this new species means “coordinated”, “(pre)concerted”, “harmonious”.

**Holotype.** Specimen no. “164D”, sex indefinable, Azar collection, housed provisionally in the Muséum National d’Histoire Naturelle, Paris [the rather clear and almost complete beetle (with missing part of the terminal tarsomeres and last antennomeres of the left protibia desegmented) with the surrounding net of organic matter is included together with one Psocoptera behind the beetle in a small and thin subquadrangular amber piece (with length about 3 and width 2 mm) with remains of 2 wings and one leg on the right side from the beetle. Both inclusions are with a net of the probably fungal remains. This piece is put between the glass slides with Canada balsam.].

**Type locality and horizon.** Lower Cretaceous, Hammana/Mdeyrij, Caza Baabda, Mouhafazet Jabal Loubnan (Central Lebanon).

**Diagnosis.** This new species differs from another member of the genus in the larger and more oval brownish (not blackish) body, with the somewhat narrower and not subflattened pronotum slightly emarginate at sides of

the scutellum (not bisinuate along the base), much shorter antennae with not extending behind abdominal ventrite 2 and shortly subtriangular dorsoventrally compressed antennomeres 6-10 and shorter legs. The protarsi of this new species are narrow and simple, while protarsi of of *E. gracilis* gen. et sp. nov. are not so narrow and slightly lobed. Besides it, the underside of this new species is certainly not so convex as that of *E. gracilis* gen. et sp. nov., while



Figures 11-19. Elodophthalmidae fam. nov.: species of the genus *Elodophthalmus* gen. nov.: *E. harmonicus* gen. et sp. nov.: 11 - body, lateroventral; 12 - idem, laterodorsal; 13 - head, dorsal; 14 - metasternum, ventral; 15 - posterior leg, ventral; *E. harmonicus* gen. et sp. nov.: 16 - pronotum and scutellum dorsal; 17 - right antenna declined ventrally, ventral; 18 - antennomeres 9 and 10 declined ventrally, ventral; 19 - anterior leg, ventral. Scale bars for figures 11, 12 - 0.5 mm; for figures 13 - 0.4 mm; for figures 14-19 - 0.3 mm.

its dorsum is covered with the shorter, more stout and not subrecumbent hairs, and its puncturation on the dorsum is clearly finer and shallower (particularly on elytra) in comparison with those in *E. gracilis* gen. et sp. nov. A part of the mentioned distinctions could have a secondarily sexual character, however the length and shape of the pronotum, peculiarities of dorsal puncturation and pubescence seem to be regarded as more or less reliable traits to separate the specimens examined into two species.

**Description.** Length 1.4 (with declined head), width 0.6, height about at least 0.5 mm. Elongate oval, strongly convex dorsally and moderately convex ventrally; subunicolourous dark brown to blackish with slightly lighter abdominal ventrites; with a slight shine; head with dense, erect, short and stout dark hairs 2-3 times as long as distance between their insertions, pronotum and elytra with somewhat longer and suberect hairs oriented posteriorly; underside with dense and rather fine greyish hairs about as long as those on pronotum and elytra.

Head and pronotum with distinct dense punctures, about 1/2 as large as eye facets in diameter, interspaces between them much narrower than a puncture diameter and smoothed. Elytra with larger and sparser punctures (only slightly smaller than eye facets) and completely smooth interspaces with distance between punctures as great as a puncture diameter. Metaventricle and abdominal ventrites with clear punctures slightly smaller than facets in diameter, interspaces between them somewhat narrower than a puncture diameter and smooth.

Head oval and slightly exposed dorsally, almost as wide as pronotum, somewhat longer than wide and about 3 times as long as distance between rather large and very coarsely faceted eyes, convex at base and flattened in the most length and with a depression between antennal insertions, anterior edge of frons distinctly angularly excised, anterior edge of eye distinctly sinuate at antennal insertion, frons rather projecting and without an isolated anterior part ("clypeus"), base of head with a transverse border at anterior edge of pronotum. Labrum well exposed, almost twice as wide as long and transverse at apex. Mandibles not exposed from under frons. Antennae with more or less compressed antennomeres 3-10 (subquadrangular antennomeres 3-6 and shortly subtriangular antennomeres 7-10), comparatively long (reaching the posterior edge of abdominal ventrite 2), ultimate antennomere somewhat enlarged and subacute at apex, scape subconical, about 1.5 times as long as antennomere 2 and about 2/3 as long as ultimate antennomere, antennomeres 3-5 shortest; antennomeres covered with sparse and long hairs. Pronotum not wider than combined elytral base, slightly more than twice as long as wide, vaulted at disk and rather steeply sloping at sides; its anterior edge almost straight and posterior one slightly convex with a weak emargination at each side of scutellum, sides looking like continuation of anterior and posterior edges meeting in an arc closer to anterior edge than posterior one, edges not bordered. Scutellum rather small, clearly transverse and with arcuate outline. Elytra markedly more than twice as long as wide combined, lon-

gest at suture and widest at shoulders, rather convex and steeply sloping and somewhat declined on ventral sides (from below visible lateral sides which wider than distance between lateral edges), with weak shoulders, adsutural lines well expressed along entire length and subparallel, their apices jointly subacute.

Most part of head underside, prosternum and mesoventricle invisible because of declination of head. Mesocoxae transverse and narrowly separated. Metaventricle medially convex, without paracoxal lines before metacoxae, its posterior edge between coxae angularly excised. Distance between metacoxae about twice as great as that between mesocoxae. Metepisterna exposed along the whole length. Metacoxae moderately oblique, with scarcely expressed femoral plate. Abdominal ventrite 1 more than 1.5 times as long as any of other ventrites; ventrite 2, 3 and hypopygidium comparable in length and ventrite 4 somewhat shorter; hypopygidium moderately rounded at apex. Epipleura extremely narrow and elevated laterally, very gradually narrowing apically and becoming obsolete at apex.

Legs well developed, quite narrow and long. Tibiae very slightly compressed and subparallel-sided, protibia about 2/3 as long as antenna, meso- and metatibiae somewhat longer than protibia; very thin and with diffuse not long setae becoming more stout along truncate apex. Femora moderately compressed, pro- and mesofemora about twice, and metafemur almost 4 times as wide as tibiae; meso- and metafemora about as long as ventrites 2-5 combined. Tarsi moderately long, with 5 simple tarsomeres, tarsomeres 1-4 narrow to subconical and very scarcely lobed beneath, protarsomere 1 about 1/4, meso- and metatarsomeres 1 about 1/3 as long as tibiae, protarsomere 5 about as long as protarsomere 1, tarsomeres 2-4 becoming smaller distally, tarsomeres with short and stout setae at apex; claws simple, narrow and not long.

*Elodophthalmus gracilis* gen. et sp. nov.

Figures 16-19; Plate 3, figures A-B.

**Etymology.** The epithet of this new species means "refined", "grace(ful)", "elegant".

**Holotype.** Specimen no. "758 - D", sex indefinable, Azar collection, housed provisionally in the Muséum National d'Histoire Naturelle, Paris [the not quite clear, partly deformed (especially because of lateral compression) and almost complete beetle with somewhat declined prothoracic segment and head and with missing part of the anterior part of head and part of its appendages as well as with partly missing terminal tarsomeres) with the surrounding pieces of organic matter and milky foggy along the underside is included in a small and thin subquadrangular amber piece (with length about 2.4 and width 2.0 mm). At left side of head apex of the holotype there is located one gas vesicle about 1/3 as large as eyes. This piece is put between the glass slides with Canada balsam.]

**Type locality and horizon.** Lower Cretaceous, Hammana/Mdeyrij, Caza Baabda, Mouhafazet Jabal Loubnan (Central Lebanon).



Plate 3. Figures A-B. *Elodophthalmus gracilis* gen. et sp. nov. (Elodophthalmidae fam. nov.): A – body, dorsal (length 0.7 mm); B – idem, ventral. Figures C-D. *Lebanophytum excellens* gen. et sp. nov. (Cerophytidae): C – body, dorsal (length 2.1 mm); D – idem, ventral. Figures E-F. *Lebanoretetes andelmani* gen. et sp. nov. (Kateretidae): E – body, dorsal (length 1.5 mm); F – idem, ventral; G – head, ventral.

**Note.** Some characters of this new species shared with another member of the genus described above are omitted in the below description.

**Description.** Length 0.8 (with declined head), width about 0.4 mm. Elongate oval, strongly convex dorsally and ventrally; subunicolorous blackish with brownish appendages; with a slight shine; head without clearly visible pubescence, pronotum and elytra with rather long, dense and subrecumbent greish hairs oriented posteriorly and about 3-4 times as long as distance between their insertions; underside with moderately dense, much less conspicuous and much shorter greyish hairs than those on the dorsum.

Head and pronotum with distinct dense punctures, about 1/2 as large as eye facets in diameter, interspaces between them about as great as a puncture diameter and smoothed. Elytra with much larger and much deeper punctures (only slightly smaller than eye facets) and completely smooth interspaces, with distance between punctures markedly narrower than a puncture diameter. Integument of the underside not visible clearly, but the abdominal ventrites with comparatively fine and rather sparse puncturation.

Head oval and slightly exposed dorsally, almost as wide as pronotum. Antennae rather long (apparently reaching the posterior edge of subultimate abdominal ventrite), with rather long and seeming slightly widened apically antennomeres 7-10, ultimate antennomere somewhat longer than basal antennomere and rounded at apex, scape apparently subconical, antennomeres 3-6 shortest; antennomeres covered with sparse and long hairs. Pronotum much more than twice as long as wide, subflattened at disk and gently sloping at sides; its anterior edge almost straight and posterior one clearly bisinuate, sides looking like continuation of anterior and posterior edges meeting in an arc closer to posterior edge than anterior one, edges not bordered. Scutellum rather small, subtransverse and with arcuate outline. Elytra markedly more than twice as long as wide combined, longest at suture and widest at shoulders. Most part of head underside invisible because of declination of head. Abdominal ventrite 1 slightly longer any of other ventrites; hypopygidium shorter than penultimate ventrite and widely rounded at apex. Legs well developed, quite narrow and long. Tarsi moderately long, protarsomeres 1-4 slightly lobed; mesotarsomere 1 conical and not very long (about 3 times as long as wide) and mesotarsomere 2 narrow and simple (slightly shorter than mesotarsomere 1); metatarsomere 1 long and simple (about 6 times as long as wide).

Family: Scirtidae Fleming, 1821

= *Sinodryopitidae* Hong, 2002: 107, syn. nov.

**Specimens examined.** Specimen no. "HAR - 2", Azar collection, from Homsiyeh-Aazour-Room deposit, Southern Lebanon, housed provisionally in the Muséum National d'Histoire Naturelle, Paris, moderately small and not strongly sclerotized female (about 2.5 mm) with the elongate body, elongate head not able to be completely declined and with very large eyes, not strongly shortened

prosternum, strongly oblique metacoxae, strongly enlarged metafemora, very long and very narrow tarsi with narrowly lobed tarsomere 4, bisegmented styli of the ovipositor (it seems to be a member of new subfamily of Scirtidae or new family near the latter); specimen no. "793", sex indefinable, Azar collection, from Hammana/Mdeyrij amber deposit, Central Lebanon, heavily sclerotized and very small body (0.9 mm) with the dorsum covered with dense and thick suberect hairs, slightly shortened prosternum and moderately developed legs (including lobed tarsomeres 2-4) (it is a member of Scirtidae with at most subfamily rank of isolation).

**Comments.** *Sinodryopitidae* originated from Fushun Lower Eocene amber (Guchengdzi Formation). The *Sinodryopitidae* could be easily diagnosed due to the rather large and very elongate body with comparatively long prothoracic segment, flat and wide pronotum and very long prosternum, and also due to the head not strongly declined ventrally, longitudinal costae on elytra, subpectinate antennomeres 3 and 4 (antennomeres 5-11 could be apparently missing), enlarged posterior legs with very thick femora and long tibial spurs. Besides, the descriptor mentioned for *Sinodryopites ovalifemoralis* Hong, 2002 (written in the original description as "*ovalifemorales*") also 4-segmented tarsi (however, it can be seen on pictures of the holotype, that the tarsomere 4 is very short and looking like very wide lobes approached to subconical tarsomere 3 – it was a reason to regard the lobes of the tarsomeres 4 as a continuation of the tarsomere 3). Nevertheless, the tarsomere 4 in this species is really quite outstanding because of rather short and very wide lateral lobes (much wider than usually in the subfamily Scirtinae sensu stricto according to the interpretation accepted in the present publication). Finally, this fossil taxon is characterized by the rather long abdomen, composing about half of the body length, while that in other Scirtidae is more or less shorter (less than half of the body length). The antennae of *Sinodryopites ovalifemoralis* look something like those in the species of *Amplectopus* Sharp, 1886, however, the latter has the smooth elytra with diffuse fine puncturation, comparatively short prosternum and moderately developed posterior legs (without enlarged femora and long tibial spurs). The costate elytra of this species are reminiscent of those in recent species of the genus *Veronatus* Sharp, 1878, but the latter differs from *Sinodryopites ovalifemoralis* in the very long antennae consisting of rather long subconical segments, comparatively short prosternum and moderately developed posterior legs (without enlarged femora and long tibial spurs). Prosternum in most Scirtidae is rather short and particularly prosternum, much shorter than that in *Sinodryopites ovalifemoralis*, however that of *Cyphotelus* Sharp, 1878 has long prothoracic segment, but with rather convex pronotum. The enlarged posterior legs with very thick femora and long tibial spurs are characteristic of some genera of the *Scirtes* complex (*Scirtes* Illiger, 1807 and *Ora* Clark, 1865), but the latter have the simple basal antennomeres, even surface of elytra and rather short prothoracic segment. In addition, *Sinodryopites ovalifemoralis* shows also some characters remi-

niscient of those in *Stenocyphon sasaji* Lawrence, 2001, particularly in rather elongate body, very long pronotum and rather long metatarsomere 1, although these forms have a lot of differences in shape of body, structure of basal antennomeres, sculpture of elytra, thickness of metafemora and development of metatibial spurs. At last, if the above mentioned specimens from Lebanese amber still remaining undescribed are taken into consideration, significance of structure of sclerites of prothoracic segment and tarsi should re-estimated.

**Discussion.** S.M. Iablokoff-Khinzorian (1961) divided Scirtidae into 2 subfamilies and some tribes. They are following: (1) "Helodinae" Shuckard, 1840 (=Elodiidae) with the penultimate labial palpomere enlarged and ultimate one located laterally on the apex of the first and consisting of the tribes Helodini sensu stricto; Microcarini Iablokoff-Khinzorian, 1961 and Scirtini Fleming, 1821; and (2) Cephoninae Stephens, 1829 with the penultimate labial palpomere not enlarged and ultimate one located apically to the first consisting of the tribes Helodopsini Iablokoff-Khinzorian, 1961 and Cephonini sensu stricto. However, such a division are need to be revised, because the diagnostic characters there proposed for both subfamilies and tribes are not rather stable and, correspondingly, not enough reliable for usage to discriminate groups with high taxonomic rank.

J.F. Lawrence and A.F. Newton (1995) reviewed the changes in taxonomic interpretation of *Amplectopus* Sharp, 1886 and discussed its similarities to Chelonariidae. They noted that the similarities in the antennal structure, fusion of 3 basal abdominal ventrites and highly compacted body of both groups do not coincide with the very characteristic Scirtoid type of aedeagus in *Amplectopus*, as well as other features shared by the latter with other Scirtinae sensu stricto, namely: subantennal fossae and sharp subgenal ridges, non-exocone eyes, abruptly curved mandibles, elongate trochanters, reduced prosternum, peculiarities in wing venation and a lobe beneath the penultimate tarsomere. These authors suppose that the genus *Amplectopus* can be regarded as "a separate subfamily, but it should be deferred until a more detailed comparative study" (p. 840), and we could add that until a more detailed comparative study on both recent and extinct groups of the family Scirtidae.

This family is represented in some deposits of different ages. Many species of some genera have been described from Baltic amber (Iablokoff-Khinzorian 1961; Klausnitzer 1976, 2004) and Fushan amber (Hong 2002). Earliest and rather many clear representatives of it, which can be considered in composition of some different genera, are present in the Upper Jurassic of Karatau (still remaining undescribed in the collection of Palaeontological Institute of the Russian Academy of Sciences, Moscow). Besides, they have been found among remains from some other outcrops different in dating. There have been found also members of this family in the Lower Cretaceous Burmese amber (Rasnitzyn & Ross 2000; Grimaldi et al. 2002) and Lebanese amber. Some species of *Cyphon* Paykull, 1799

were recovered also in the Lowermost Eocene amber deposit in Paris Basin (Kirejtshuk & Nel in press). Finally, H.F. Wickham (1914) described one palaeoendemic genus *Miocyphon* of the family Dascillidae from Florissant beds (Oligocene), which scarcely can be compared as close relatives with representatives of both Dascillidae and Scirtidae. In contrast to most Scirtidae, the latter has according to the original description and drawings the comparatively large body (8.0 mm), prosternal segment not rather short, head not clearly declined and subtruncate elytral apices. This fossil taxon is strongly needed to be re-examined. Thus, for now the genus *Miocyphon* should be regarded outside from the family Scirtidae rather than as an aberrant form of this family (as "familia incerta").

#### Family: Cerophytidae Latreille, 1834

This family is well isolated from the rest groups of Elateroidea and rather recognizable in fossils. It was recorded from Baltic amber (Hieke & Pietrzeniuk 1984: 305), Upper Cretaceous amber (Taymyr: Zherichin 1977), lacustrine beds of Lower Cretaceous Baisa (Ponomarenko & Kirejtshuk 2008). The recent species of this group spreads in Europe, and also in North and South America. Bionomy of both adults and larvae of the recent species is connected with angiosperm trees, larvae have been collected in old decomposing (brown rotten) wood. After this study the age of the origin of this group should be essentially lowered. Moreover, the *Necromera baeckmani* Martynov, 1926 from Jurassic Karatau should be also regarded not as Oedemeridae (as was treated in the original description), but in composition of the family Cerophytidae. Among prints from Karatau beds there are found more than a hundreds of the remains of this family which look very different and can be divided into some genera. Finally, one specimen of this family is also revealed in prints from Lower Cretaceous Las Hoyas. However, all forms found in lacustrine carbonate have comparatively large body (6-12 mm), comparable with recent representatives, while the specimens from amber are considerably smaller.

**Discussion.** This family includes three recent genera: *Cerophytum* Latreille, 1806 with 4 extant species; *Brachycerophytum* Costa, Vanin, Lawrence et Ide, 2003 with 2 extant species; and also *Phytoceram* Costa, Vanin, Lawrence et Ide, 2003 with 14 extant species. V.V. Zherikhin (1977) described also genus *Aphytocerus* which unites 2 extinct species: *A. communis* Zherichin, 1977 and *A. dolganicus* Zherichin, 1977 from Taymyr amber with the Albian-Cenomanian and Santonian age. The comparison of these taxa and the genus here described with other fossils accessible during our work with preparation of this paper makes possible to admit that the genus *Necromera* Martynov, 1926 is present close relatives to other members of the family. Moreover, some materials from the Lower Cretaceous (Baissa) and Upper Jurassic (Karatau) limestone and shale outcrops contain a lot of remains which demonstrate more or less considerable similarity to *Necromera*. These remains can be easily recognized due to the



characteristic head with rather large eyes, closed antennal insertions and frequently quite characteristic apex of prothoracic segment. They certainly represent many different species and, perhaps, some genera, which could be distinguished in the shape of head, structure of antennae, shape of pronotum, sculpture and puncturation on elytra, but which should be described in further study. F. Hieke and E. Pietrzeniuk (1984) pointed out that S.G. Larsson published picture of this family with the erroneous determination as Rhipiphoridae (Larsson 1978: 96). After this work, it will be able to definite composition of the family in general and its position among other groups of the superfamily Elateroidea. It would be important to note that all recent representatives of the family are known as associated with angiosperm trees from different families. Of course, such association scarcely can be supposed for the forms occurred during the Lower Cretaceous and Jurassic, and their ecological association should be expected among trees from the gymnosperm families. Therefore, it can be supposed that the Mesozoic groups of this family are not very closely related to the Caenozoic ones. The description of *Lebanophytum excellens* gen. et sp. nov. seems to be very important, because this genus give some characters connecting the recent genera and Jurassic groups, in particular it concerns the prognathous and somewhat elongate head, and subsequently now this family can be more comprehensively outlined.

GENUS: **Lebanophytum** gen. nov.

Type species: *Lebanophytum excellens* gen. et sp. nov.

**Etymology.** The name of this new genus species is formed from the name of country of origin (Lebanon) and one root of generic name *Cerophytum*, recent relative of the Cretaceous form; neuter gender.

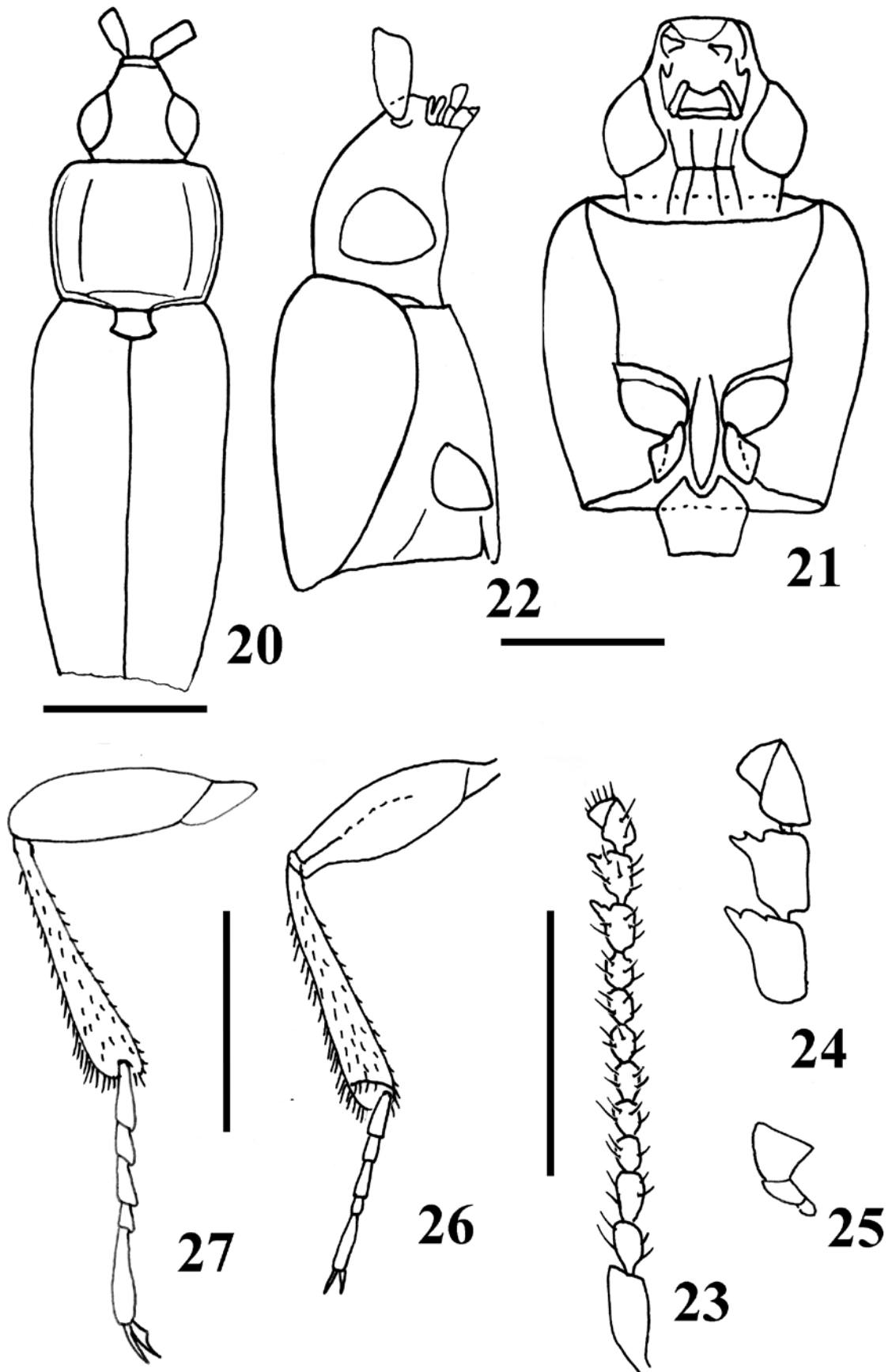
**Diagnosis.** The attribution of this new genus to the family Cerophytidae is quite evident because of the very characteristic structure of anterior part of head with closed antennal sockets and somewhat retracted mouthparts, peculiar structure of prosternum and interlocking mechanism, and also the profemur with a clear rather long fold on the inner surface for the reception of protibia. However, in contrast to other genera of Cerophytidae, *Lebanophytum* gen. nov. is characterized by separated metacoxae (not separated as in the rest groups of the family). The family includes 3 recent genera (Costa et al. 2003) and 2 extinct described genera (*Necromera* Martynov, 1926 and *Aphytocerus* Zherichin, 1977) and some undescribed extinct genera from the Mesozoic (see above). The body size of *Lebanophytum excellens* gen. et sp. nov. is correspondent only to the species of *Aphytocerus*, but the rest groups consist of much larger representatives. However the new genus is distinct from the latter in the diffuse puncturation of elytra, not retracted head with 11-segmented and non serrate antennae (with much longer antennomere 2), smaller eyes not emarginate along anterior edge, subquadrangular pronotum with not projecting posterior angles and subrectilinear anterior edge, widely separated notosternal

sutures of prothorax, narrowly separated procoxal cavities, subrectilinear edge of elytra (viewed laterally), rather long abdominal ventrite 1, transverse procoxae, shorter trochanters, femora not so enlarged apically, profemur without long setae, lack of tibial spurs, shorter tarsomere 1, not lobed tarsomeres 2 and 3.

*Lebanophytum excellens* gen. et sp. nov. differs from the recent members of the family in the much smaller body size, diffuse puncturation of elytra, longer and subprognathous head, neither serrate nor pectinate antennae, but with much longer antennomere 2, smaller palpi, insertions of labial palpi located at apex of ligula, subquadrangular pronotum with not projecting posterior angles and subrectilinear anterior edge, transversely oblique procoxae, narrowing prosternal process (not enlarged behind coxae), distinct median plate of mesoventrite, distinctly separated and transverse metacoxae, shorter trochanters of intermediate and posterior legs, flattened metatibia, shorter tarsomere 1 of all legs, not lobate tarsomeres 2 and 3; also from members of *Cerophytum* in the securiform ultimate maxillary palpomere; from representatives of *Brachycerophytum* and *Phytocerus* also in the distinct longitudinal carina on inner surface of profemur.

*Aphytocerus communis* (according to the holotype deposited in the collection of the Palaeontological Institute of the Russian Academy of Sciences, Moscow), in contrast to the new species of *Lebanophytum* gen. nov., has the more oval body, coarse puncturation and coarse sculpture of dorsal integument, erect short hairs on pronotum, extremely short and mostly retracted (concealed dorsally) head with strongly retracted mouthparts, more arcuate pronotum with the steeply sloping unbordered sides as well as with the strongly projecting and sharply pointed posterior angles, simple last antennomeres, subpentagonal scutellum with subrounded to subangular apex, prosternum with deeply excised anterior edge, prosternal process much wider with a very widely rounded apex, much widely separated all pairs of coxae, wider epipleura (almost twice as wide as scape), longer and larger trochanters, very narrow femora and tibiae, distinct tibial spur, femora without long fold along inner surface to reception of tibiae, shorter tarsomere 1, bilobed tarsomeres 3 and 4. Other peculiarities of it including structure of metacoxae are as in the species of *Lebanophytum* gen. nov.

Finally, the species of *Lebanophytum* gen. nov., like species of the genus *Necromera* and some related undescribed Cretaceous and Jurassic genera (see above), have the more or less prognathous (not retracted) head (although the type specimen of the type species of *Necromera* shows partly retracted head) and not contiguous metacoxae, however, it differs from the latter in the much smaller body, and indistinct puncturation. Besides, in contrast to members of *Lebanophytum* gen. nov., some of these undescribed genera include the species with the elytra bearing striation or puncturation arranged in longitudinal rows, distinctly pectinate antennae and other peculiarities different from the characters of the form under description.



Figures 20-27. Cerophytidae: *Lebanophytum excellens* gen. et sp. nov.: 20 - body with outline of depressions and dorders on pronotum, dorsal; 21 - head and prothorax with median plate of mesosternum, ventral; 22 - head and prothorax, lateral; 23 - antenna, dorsal; 24 - terminal antennomeres, dorsal; 25 - labial palpus, ventral; 26 - anterior trochanter, femur and tibia, ventral; 27 - posterior leg, ventral. Scale bars for figures 20, 21, 23-27 – 0.5 mm; for figure 22 – 0.3 mm.

**Notes.** This genus is represented by the only species, and therefore the description of it overlaps with the description of species (“*descriptio generica specifica*”).

*Lebanophytum excellens* gen. et sp. nov.

Figures 20-28; Plate 3, figures C-D.

**Etymology.** The epithet of this new species means “fine”, “splendid”, excellent”.

**Holotype.** Specimen no. “840AB”, sex indefinable, Azar collection, housed provisionally in the Muséum National d’Histoire Naturelle, Paris [The almost clear and almost complete beetle (left mesotarsus missing) together with one ? Ceratopogonidae (Diptera) and some pieces of black organic matter below the beetle on the right side is included in a small quadrangular and thin amber bar of comparatively dark color (with measurements about 4.0, 2.0 and 2.0 mm) with some small gas vesicles and small pieces of organic matter throughout the piece. The apices of elytra and sclerites of ultimate abdominal segments are missing. A considerable part of dorsal and underside integument with a thin cover of gas because of pubescence and coarse sculpture. This piece is put between the glass slides with epoxide resin and attached to the “covering” glass.].

**Type locality and horizon.** Lower Cretaceous, Hammana/Mdeyrij, Caza Baabda, Mouhafazet Jabal Loubnan (Central Lebanon).

**Description.** Length 2.1, width 0.6, height 0.4 mm. Elongate, rather convex dorsally and ventrally; subunicolourous blackish; mat; integument with dense, recumbent, rather short and dark (hardly visible) fine hairs apparently not longer than twice as long as distance between their insertions, pronotal and elytral sides distinctly ciliate with hairs as long as tarsal claws.

Head and abdominal ventrites with unclear puncturation and very dense, fine, but rather relief microsculpture. Pronotum with small, shallow and more or less distinct punctures, about 1/3 as large as eye facets in diameter, interspaces between them somewhat greater than a puncture diameter, finely very densely and rather relief microreticulated. Elytra with somewhat larger and much sparser punctures (only slightly smaller than 1/2 of eye facets) and about as microsculptured as pronotum. Prosternum with more or less clear punctures as large as those on pronotum, interspaces between them subequal to a puncture diameter or slightly greater and about as sculptured as dorsal sclerites. Metaventrite with moderately deep and distinct punctures about 1/4 as large as eye facets in diameter and apparently with more smoothed microsculpture than that on other sclerites of body.

Head subtriangular, somewhat declined (particularly at anterior part of frons), almost as wide as anterior sclerotized orifice of pronotum, somewhat shorter than wide and about twice as long as distance between rather large and very coarsely faceted eyes, convex at base and flattened in the most length. Labrum well exposed, subquadrangular. Mandibles not exposed from under frons. Antennae 11-segmented, comparatively long (reaching the posterior edge of abdominal ventrite 2) and subfiliform to submoniliform;

scape subcylindrical, comparatively small, about twice as long as subcylindrical antennomere 2; antennomere 3 subconical and somewhat longer than antennomere 2; antennomeres 4-8 submoliform to subcylindrical, comparable in length, slightly shorter than antennomere 2; antennomeres 9-11 subequal in length and about as long as antennomere 2, antennomeres 9 and 10 subconical, slightly wider than antennomere 2 and with outer finger-like process, ultimate antennomere somewhat subconical, subacute at apex with flat triangular process oriented dorsolaterally. Pronotum slightly wider than long, vaulted at disk and sublateral and subbasal depressions, sides laterally from paralaralateral depressions gently sloping and very narrowly explanate at edges, its anterior edge slightly convex and posterior one straight in the middle and emarginate at sides, anterior angle widely rounded and posterior one rectangular, sides and emarginate parts of base bordered. Scutellum strongly transverse and widened to truncate apex. Elytra markedly more than twice as long as wide combined (apices missing), widest at shoulders, rather convex and steeply sloping and slightly declined on ventral sides, with distinct lateral carina, with well raised shoulders, sutural lines not expressed, epipleura well expressed at base and becoming obsolete distally; edge of elytra very slightly S-curved (viewed laterally). Pygidium invisible.

Head underside with rather big subvertical genal ridges (distance between their apices and plane of mentum about as width of scape, gular sutures widely separated and with narrowest place in the middle. Mentum very transverse and more than 4 times as wide as long. Ligula rather long and palpal insertions located closely to apex. Labial palpomeres 3-segmented, last labial palpomere flattened and subtriangular. Maxillary palpi not clearly visible; last palpomere flattened, subquadrangular and somewhat widened apically, its apex slightly narrower than that in last labial palpomere. Prosternum strongly convex along the middle and sharply elevated along distinct notosternal sutures, its process narrow and narrowing apically to angular excision of mesoventrite; prohypomeres apparently not closing procoxal cavities. Procoxae transverse, externally reaching prohypomeres. Distance between mesocoxae nearly 3.5 times as great and that between metacoxae about 2.5 times as great as that between procoxae. Mesoventrite with a median subpentagonal plate and anterior excision to receive prosternal process. Mesocoxal cavities oval and closed externally. Metaventrite convex along the middle, but with distinct median narrow furrow, its anterior edge between coxae convex and its posterior edge between coxae angularly and deeply excised. Metacoxae transverse (almost not oblique) and with scarcely raised femoral plate. Abdominal ventrite 1 somewhat longer than ventrites 2 and 3 combined, only base of hypopygidium present (apparently it longer than each of ventrites 2 and 3). Epipleura about as wide as scape at base and gradually narrowing posteriorly, but not reaching the middle of elytra.

Legs well developed and narrow. All trochanters of elongate type and very long. Tibiae long and narrow, comparable in width (slightly narrower than scape) and mesoti-

bia slightly longer than protibia and somewhat shorter than metatibia; pro- and mesotibiae scarcely compressed and not bordered along outer edge, but with diffuse, rather long and stout setae along outer and dorsal surface; metatibia subflattened and with a row of rather long and stout setae along outer edge; apices of all tibiae oblique and with rather stout setae; spurs not raised. Femora moderately compressed (particularly intermediate and posterior ones), profemur somewhat more than twice and meso- and metafemora about 3 times as wide as corresponding tibiae; profemur with a clear and rather long fold on the inner surface for reception of protibia. Tarsi 5-segmented, about 5/6 as long corresponding tibiae, tarsomeres 1-3 with oblique apices and few long setae (longer on underside than above); tarsomere 4 shortest and subcylindrical; tarsomere 5 longest and about twice as long as each of tarsomeres 1-3; tarsal claws long, oriented distally and with a long tooth at base.

Family: Kateretidae Erichson, 1843

This family is known from fossils only after description of *Amartus petrefactus* Wickham, 1912 from Lower Oligocene Florissant shales and one new genus from Lowest-Eocene amber (Kirejtshuk & Nel in press), although some undescribed genera and species of it were revealed in Baltic amber as well. The recent members of this groups are associated flowers of angiosperms.

GENUS: *Lebanoretetes* gen. nov.

Type species: *Lebanoretetes andelmani* sp. nov.

**Etymology.** The name of this new genus species is formed from the name of country of origin (Lebanon) and one root of generic name *Kateretes* recent relative of the Cretaceous form; masculine gender.

**Notes.** This genus is represented by the only species, and therefore the description of it overlaps with the description of species (“*descriptio generica specifica*”).

**Diagnosis.** This new genus clearly belongs to the family Kateretidae, as it shows the transverse coxae of all pairs, somewhat loosed antennal clubs, shortened elytra and heavily sclerotized exposed abdominal tergites. In contrast to all recent genera of the family, *Lebanoretetes andelmani* gen. et sp. nov. has three abdominal segments completely uncovered by elytra, due to which the general beetle appearance is rather similar to that in species of the genus *Brachypeplus* Erichson, 1843 (subfamily Cillaeinae: Nitidulidae). Among other outstanding characters are the subflattened dorsum, not bordered and with indistinct carina at lateral sides of pronotum, antennal club almost truncate at apex, comparatively wide laterosternites on abdominal segments uncovered by elytra, very weak lateral carina of elytra. Nevertheless, it certainly has a considerable similarity to the genus recently recovered in the Lowermost Eocene French amber (Kirejtshuk & Nel, in press), although from the latter it differs in the smaller and very narrow body, antennal club parallel-sided and not subtruncate apex, narrower mentum with subpentagonal shape, not arcuate

outline of eye edge on underside, not oval pronotum with sides not distinctly bordered and not explanate, different characteristic scutellum, longer elytra, regulary narrowing abdominal segments, not widely separated metacoxae and simple tarsal claws. The outstanding feature of this genus is the absence of tibial spur, which is also absent in the mentioned inclusion from the Lowermost Eocene French amber.

**Discussion.** This fossil represents the eldest record of the family. Nevertheless, it looks like a rather derivate member of it because of the comparatively subflattened and elongate body, rather short elytra remaining 3 abdominal segment uncovered. All these peculiarities give to the appearance of *Lebanoretetes andelmani* gen. et sp. nov. a considerable similarity to groups of the subfamily Cillaeinae and Maynipeplinae (both from Nitidulidae), however, its antennal club, steeply sloping pronotal and elytral sides, rather narrow prosternal process not extending far behind procoxae demonstrate that the species under description can be joined to Kateretidae rather than Nitidulidae. At the same time it is important to note that *Lebanoretetes andelmani* gen. et sp. nov. [like most Cillaeinae (“Latefimbriata”) and Maynipeplinae] has the heavily sclerotized, rather wide and distinctly outlined laterosternites on dorsal surface of 3 abdominal segments uncovered by elytra.

It is thought that the trophics, bionomics and ecological preferences of *Lebanoretetes andelmani* gen. et sp. nov. had some similarities to those in the recent members of the family Kateretidae. If so, its association with plant generative organs can be supposed. All recent species feed on angiosperm flowers (both Magnoliopsida or Dicotyledones and Liliopsida or Monocotyledones), but as to the species under description, its probable food plant remains unclear. G.O. Poinar (2004) described a grass-like monocots from Burmese amber. If this plant group extends the time of the Lebanese forest, it would be possible to expect that some representatives of it could give a base for existence of Kateretidae (also if this coleopterous group was initially anthophagous). Although ancient Kateretidae could be associated with different groups of proangiosperms described from Lower Cretaceous.

*Lebanoretetes andelmani* gen. et sp. nov.

Figures 30-34; Plate 3, figures E-G.

**Etymology.** The epithet of this new species is devoted to Mikhail Andelman, friend of A.G. Kirejtshuk from the childhood, with whom he spent a lot of time to in mountains and forests, observing life of wild animals, including insects.

**Holotype.** Specimen no. “1136”, sex indefinable, Azar collection, housed provisionally in the Muséum National d’Histoire Naturelle, Paris [the rather clear complete beetle with a small gas layer along apical abdominal ventrites and a small gas layer externally from right mesocoxa is included in a small amber piece with small dark gas vesicles and some dispersed small pieces of organic matter put between the glass slides with Canada balsam. Besides, one crack is

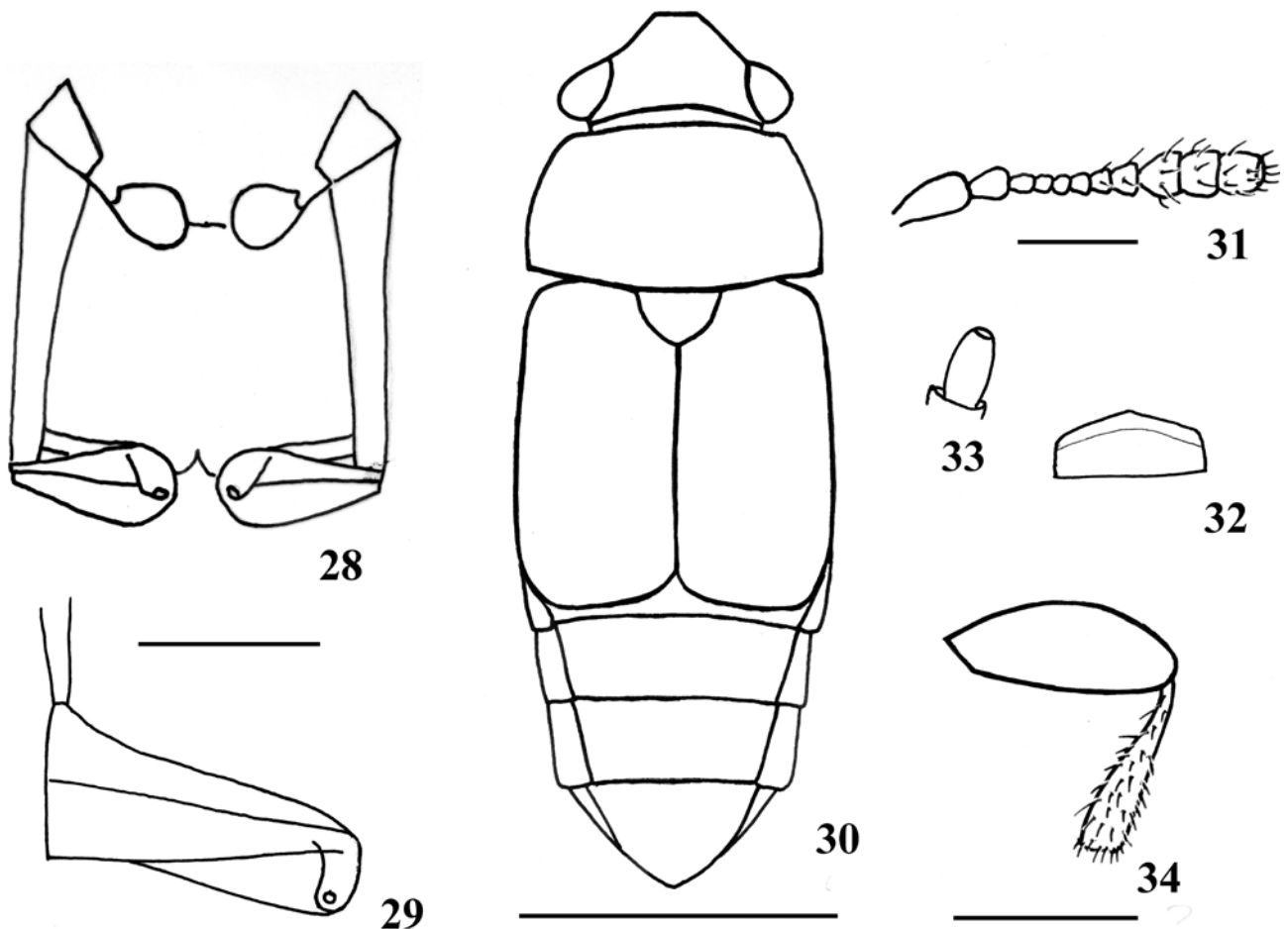
disposed along the left side of beetle body through distal half of pronotum, elytra and abdominal tergites.].

**Type locality and horizon.** Lower Cretaceous, Hammana/Mdeyrij, Caza Baabda, Mouhafazet Jabal Loubnan (Central Lebanon).

**Description.** Length 1.5, width 0.5, height ? 0.4 mm. Elongate, slightly convex to subflattened dorsally and moderately convex ventrally; blackish with dark brown appendages; mostly mat; dorsum with very conspicuous yellowish silver greyish subrecumbent hairs, masking puncturation and sculpture of integument, somewhat more than twice as long as distance between their insertions on head and pronotum and 3-4 times as long as distance between their insertions on uncovered tergites, hairs on elytra particularly long and dense and about 5 and more times as long as distance between them; underside with somewhat shorter but also rather conspicuous silver greyish subrecumbent hairs about 1.5 times as long as distance between their insertions. Integument of dorsum partly also masking with very small gas vesicles, associated with dense pubescence.

Head, pronotum and elytra with very coarse microsculpture looking like a very fine microgranulation. Uncovered tergites, pygidium and underside with similar but somewhat smoothed sculpture.

Head of usual subtriangular shape, somewhat longer than distance between eyes, subflattened, eyes small, coarsely faceted and with short interfacetal hairs, temples absent, behind eyes a transverse vertical line well raised. Labrum invisible because of declination of head in amber. Mandibles moderately developed and slightly exposed from under frons and with narrow and acute apex of right mandible. Antennae moderately long, about 6/7 as long as head wide at eyes; scape elongate oval, about 1 and 1/3 as long as wide and about 1/2 as long as antennal club; antennomere 2 somewhat narrower than scape and 3/4 as long as scape; antennomeres 3-8 comparable in length and about 1/3 as long as antennomere 2, antennomeres 3 and 4 subconical, antennomeres 5 and 6 rather moniliform and slightly thicker; antennomeres 7 and 8 moniliform and yet thicker; subcylindrical 3-segmented club with abrupt apex comprising about 1/3 of total antennal length, with antennomere



Figures 28-34. Cerophytidae: *Lebanophytum excellens* gen. et sp. nov.: 28 - metasternum, ventral; *Cerophytum elateroides* (Latreille, 1804): 29 - metacoxa, ventral; Kateretidae: *Lebanoretetes andelmani* gen. et sp. nov.: 30 - body, dorsal; 31 - antenna, dorsal; 32 - mentum and eyes, ventral; 33 - last labial palpomere, ventral; 34 - metafemur and tibia, ventral. Scale bars for figures 28, 29 - 0.3 mm; for figure 30 - 0.5 mm; for figure 31 - 0.1 mm; for figure 34 - 0.2 mm.

10 slightly shorter than antennomeres 9 and 11; apex of antennomere 11 truncate and widely membranous. Pronotum about 1 and 1/3 as long as wide, rather vaulted at disk and rather steeply sloping at sides; its anterior edge rather convex but with a short emargination at each anterior angle, posterior edge convex in the middle and subsinuate at posterior angles, anterior and posterior angles widely rounded, sides gently arcuate with indistinct lateral carina, edges not bordered. Scutellum transverse and subsemicircular. Elytra about 1 and 1/5 as long as wide combined, subflattened at disk and rather steeply sloping at sides (subvertically), their lateral edges invisible dorsally, longest at apical outer angle, clearly oblique at apex and forming a rather open sutural angle, sides gradually and very slightly divergent apically, shoulders moderately raised, adsutural lines invisible and their apices leaving uncovered 3 last tergites and an apical part of the preceding one. Uncovered tergites V and VI gently convex and about 2/3 as long as pronotum, pygidium apparently somewhat longer and very widely rounded at apex, laterosternites V and VI rather wide and flat.

Eyes on underside somewhat enlarging and markedly wider than dorsal side, with subangular outline, minimal distance between them almost as great as width of mentum. Anterior part of head underside with many small gas vesicles and small pieces of organic matter lying just on integument. Mentum subpentagonal, about twice as wide as antennal club long and about 3 times as wide as scape long, its anterior edge disposed at the level of anterior edge of eyes. Ultimate maxillary palpomere oval and about 1.5 times as long as thick. Ultimate labial palpomere subcylindrical to slightly conical, narrowing apically and about 2.5 times as long as thick. Antennal grooves clearly visible and convergent. Prosteron medially vaulted, its length before procoxae twice shorter than metaventrite; process very narrow and almost not extended beyond posterior edge of procoxae. Distance between mesocoxae about 5 times and that between metacoxae about 4 times as great as that between procoxae. Mesoventrite not excavate and moderately convex medially. Metaventrite medially gently convex, but slightly depressed before metacoxae, its posterior edge shallowly emarginate. Submetacoxal line not expressed. Abdominal ventrite 1 about as long as hypopygidium and about twice as long as each of ventrites 2 and 3; hypopygidium widely rounded at apex. Epipleura of elytra very narrow (not wider than antennal club), elevated laterally and lateral carina rather weak.

Legs well developed, moderately narrow and moderately long. Tibiae comparable in length, slightly widened apically, apparently slightly wider than antennal club (although metatibia clearly wider than antennal club and more flattened than anterior and intermediate tibiae), with truncate apex; protibia without visible crenellation along outer edge, mesotibia without clear outer borders or long hairs and metatibia with long hairs but without clear outer borders. Femora of usual configuration and about twice as wide as corresponding tibiae. Tarsi with 3 first segments lobed and, tarsomere 1 somewhat longer than each of tar-

someres 2-4 and tarsomere 5 slightly shorter than tarsomeres 1-4 combined, protarsus about 1/2 as wide as antennal club, meso- and metatarsi somewhat narrower; claws simple, narrow and rather long.

Family: Latridiidae Erichson, 1842

This family is present completely mycetophagous group associated with spores and mycelium of different fungi (both lower and higher), particularly moulds and other Ascomycetes, live in branches of trees, leaf-litter, fruit-bodies of macrofungi and decaying substrates of plant origin. Recent species are distributed over the world, except for pre-polar areas. Usually this family is considered to consist of two subfamilies (Latridiinae and Corticariinae Curtis, 1829). The earliest record of this group is known from Lower Cretaceous Burmese amber (Rasnitzin & Ross 2000). Then it was registered in Upper Cretaceous amber from Yantardakh (Zherichin 1977). Most number of members of this family (both Latridiinae and Corticariinae) were recorded from the Upper Eocene Baltic amber (Klebs 1910; Hieke and Pietrzeniuk 1984; Borowiec 1985; Kubisz 2000 etc.), although some species recovered also in the Lower Oligocene Florissant shales (Wickham 1913, 1914a, 1914b) and Aix deposits (Heer 1856), Lower Miocene Rott (Schlechtendal 1894) and Pliocene Durham (Lesne 1920).

The specimen examined has a quite characteristic combination of characters, which give a reason to join it with other members of this family. It concerns the body more or less elongate and moderately convex dorsally and ventrally, with the very coarse sculpture of heavily sclerotized integument (particularly at dorsum), complex configuration in the pronotal shape, comparatively large head subprognathous and rather extended anteriorly, complete elytra with striate puncturation and epipleura reaching the apices, small subglobular procoxae narrowly separated each from another, closed mesococcal cavities, 10-segmented antennae with loosed club and narrow legs.

Subfamily: Tetrameropsinae subfam. nov.

Type genus: *Tetrameropsis* gen. nov.

**Composition.** The new subfamily is proposed for the only generic group consisting of one species.

**Diagnosis.** The subfamily here described, in contrast to other groups of the family, is characterized by the extremely large eyes, very long prosternal process, sharp ridges on mesoventrite isolating the median depression for reception of the apex of procoxal process, not wide anterior part of frons, sharp ridge (going along the anterior edge and arcuately continuing posteriorly as paramedian branches of it) on metaventrite isolating the median part of sclerite from lateral ones, comparatively large scutellum, deep adsutural lines on elytra, very long and narrow 4-segmented tarsi. These peculiarities make this species rather distinct from all groups included in two subfamilies of the family usually recognized in the recent fauna.

Tetrameropsinae subfam. nov. shows a more similarity to Latridiinae than to Corticariinae due to its long prosternal process, complex configuration, coarse sculpture of dorsum, rather conspicuous pubescence, 5 abdominal ventrites, although, in addition to the distinguishing characters mentioned above, it has not widened anterior part of frons and its epicranium has no visible furrow along the middle.

**Description.** Body small, elongate oval, strongly convex at elytra and rather convex ventrally, pubescent. Dorsum with coarse puncturation and very relief microsculpture (only head indistinctly punctured). Underside with indistinct punctures, looking like irregular depressions. Head with very large eyes, antennal insertions located just before anterior edge of eyes; eyes very coarsely faceted. Mandibles apparently very small or reduced. Antennae 10-segmented, with enlarged 3 apical antennomeres. Pronotum subhexagonal, vaulted along the middle. Scutellum with a subtransverse apex. Elytra complete, convex at disk and steeply sloping at narrowly subexplanate sides, adsubtural lines expressed. Abdomen invisible dorsally. Eyes on underside as large as on dorsal side. 3 maxillary palpomeres transverse and ultimate subtruncate at apex. Ultimate labial palpomere narrowing apically. Antennal grooves developed. Prosternum with process very narrow and far projecting beyond posterior edge of procoxae. Distance between mesocoxae and that between metacoxae markedly greater than that between procoxae. Procoxae suboval and comparatively small, apparently not completely closed posteriorly. Mesoventrite with distinct ridges isolating the median excavation for reception of prosternal process. Mesocoxae suboval and closed laterally. Metaventrite depressed in the middle and with sharp ridges isolating this depression from anterior and lateral parts. Metepisterna very narrow. Abdomen with 5 ventrites. Epipleura of elytra moderately narrow, elevated laterally. Legs narrow and long. Trochanters of elongate type. Tibiae thin, without spurs. Femora of usual configuration. Tarsi with 4 simple tarsomeres.

**Remarks.** The probable bionomy could be more or less similar to that in the recent species of the family and its trophics can be characterized as mycotophagy in broad sense.

GENUS: *Tetrameropsis* gen. nov.

Type species: *Tetrameropsis mesozoica* sp. nov.

**Etymology.** The name of this new genus consists of the Greek roots “tetra” (four), “meron” (part, portion) and ending “opsis”; feminine gender.

**Notes.** This genus is represented by the only species, and therefore the description of it overlaps with the description of species (“*descriptio generica specifica*”).

*Tetrameropsis mesozoica* gen. et sp. nov.

Figures 35-41; Plate 4, figures A-D.

**Etymology.** The epithet of this new species is formed from term used for the geological era.

**Holotype.** Specimen no. “474A”, sex undefinable, Azar collection, housed provisionally in the Muséum National d’Histoire Naturelle, Paris [the rather clear complete beetle with a small gas layers along both dorsum and underside (particularly on elytra, median part of abdominal ventrite 1 before metacoxae and with narrow stripe of white substance on the right submedian part of head and prosternum as well as behind right mesocoxa is included in a small elongate bar of amber put between the glass slides with Canada balsam. Besides, the lateral parts of elytral apices slightly torn along edges.].

**Type locality and horizon.** Lower Cretaceous, Hammana/Mdeyrij, Caza Baabda, Mouhafazet Jabal Loubnan (Central Lebanon).

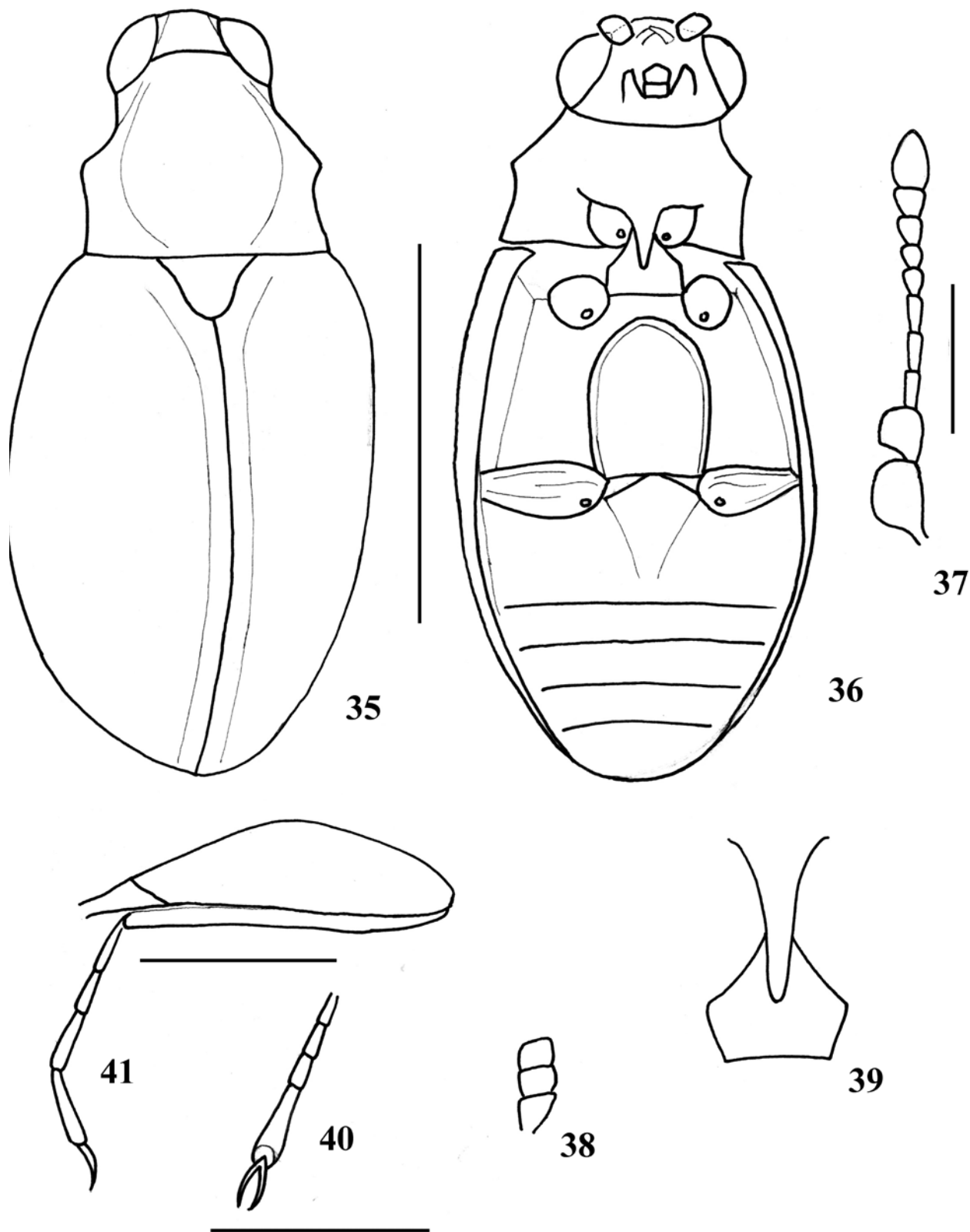
**Description.** Length 1.2, width 0.5, height about ? 0.4 mm. Elongate oval, strongly convex at elytra and rather convex ventrally; dark brownish with blackish head and thoracic sclerites and brownish reddish appendages; mostly mat, although elytra with some shine; head (at least basal part) with fine and very suberect hairs about twice as long as distance between their insertions, the rest dorsal sclerites with much longer and much sparser hairs (4-5 times longer than those on head base), 2-3 times as long as distance between their insertions; underside with suberect hairs intermediate in length between those on head base and those on other dorsal sclerites, about twice as long as distance between their insertions.

Head without distinct puncturation with very fine, dense and relief microsculpture. Pronotum and elytra with very coarse, shallow, partly indistinct, diffuse and irregular (partly elongate) punctures 2-4 times as large as eye facets in diameter (punctures along elytral base distinct and particularly coarse); interspaces between punctures on pronotum 1-2 times as great as eye facets in diameter finely and densely microreticulated; interspaces between punctures on elytra 2-3 times as great as eye facets in diameter and somewhat smoothly microreticulated to smoothly alutaceous. Underside with punctures looking like irregular depressions (or shallow fossae) much larger than eye facets in diameter (on abdominal ventrites these fossae hardly visible), integument in the middle of metaventrite somewhat smooth alutaceous, but on the rest underside surface with very fine, dense and relief microsculpture.

Head rather long and flat, apparently somewhat more than 3 times as long (from vertex to anterior edge of frons) as distance between eyes, somewhat declined ventrally, with very large eyes, distance between them about as great as width of one eye; antennal insertion located just before anterior edge of eyes; frons convex (not flattened), rather narrow, moderately projecting before antennal insertions and apparently with subtruncate anterior edge; lateral edges behind eyes nearly parallel-sided; eyes very coarsely faceted. Labrum invisible clearly because of declination of head in amber, however, apparently well exposed and probably rather projecting. Mandibles not exposed from both above and below. Antennae moderately long, about 1 and 1/3 as long as head wide at eyes; scape subflattened

and quadrangular, nearly as long as ultimate antennomere; antennomere 2 suboval to subquadrangular, about as long as wide to transverse, about 1/2 as long as scape; antennomeres

3-5 narrow and subcylindrical, slightly longer than antennomere 2; antennomeres 4 and 5 narrow and subcylindrical, slightly shorter than antennomere 2; antennomeres 6 and



Figures 35-41. Latridiidae: *Tetrameropsis mesozoica* gen. et sp. nov.: 35 - body, dorsal; 36 - idem, ventral; 37 - antenna, dorsal; 38 - maxillary palpus, ventral; 39 - prosternal process and medial plate of mesosternum, ventral; 40 - anterior tarsus, dorsal; 41 - posterior leg, ventral. Scale bars for figures 35, 36 - 0.5 mm; for figures 37, 40, 41 - 0.2 mm.



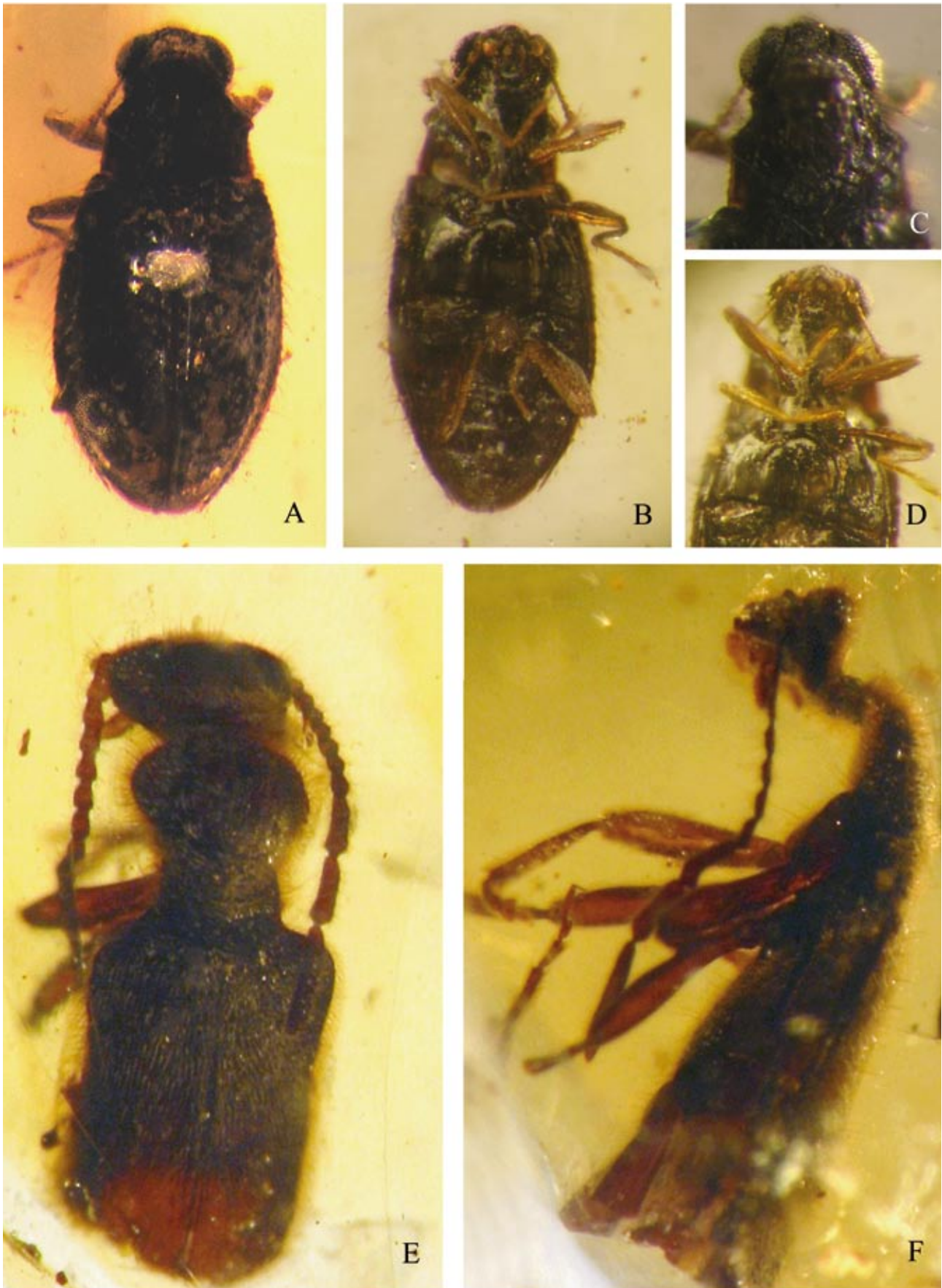


Plate 4. Figures A-D. *Tetrameropsis mesozoica* gen. et sp. nov. (Latridiidae): A – body, dorsal (length 1.2 mm); B, – idem, ventral; C – head and pronotum, dorsal; D – thorax and head, ventral. Figures E-F. *Camelomorpha longicervix* gen. et sp. nov. (Anthicidae): E – body, dorsal (length 2.3 mm); F – idem, lateral.

7 about as long as 2 previous ones, but somewhat wider; antennomeres 8 and 9 somewhat widened apically and not compressed, somewhat longer and much wider than previous ones; antennomere 10 about as long as antennomeres 8 and 9 combined, wider than all flagellomeres, slightly compressed, widest at the middle and gradually narrowing to subacute apex. Pronotum subhexagonal (taking into consideration sublateral folds in the anterior part), about as long as wide, rather vaulted along the middle and moderately steeply sloping at widely subexplate sides (and widely explanate posterior angles), besides, in anterior part along each lateral side with a clear carina there is an horizontal fold with a triangular process; its anterior edge strongly convex and strongly projecting anteriorly, posterior edge widely emarginate at sides of scutellum and rather projecting at scutellum, anterior angles widely rounded and concealed under lateral folds, posterior angles nearly right and with a distinct top, sides gently narrowing anteriorly, edges not bordered. Scutellum distinctly narrowed in the middle and with a subtransverse apex. Elytra about 1.6 as long as wide combined, strongly convex at disk and rather steeply sloping at narrowly subexplanate sides, rather widening behind well raised shoulders till the middle and then gently narrowing to subtruncate apices, adsutural lines well expressed along the whole length and diverging at base.

Eyes on underside as large as on dorsal side, with slightly curved outline, minimal distance between them almost twice as great as width of eye. Mentum invisible clearly. 3 maxillary palpomeres transverse and ultimate subtruncate at apex. Ultimate labial palpomere conical, narrowing apically and apparently about twice as long as thick. Antennal grooves clearly visible and convergent. Prosternum medially vaulted, its length before procoxae about 1/3 as long as metaventrite; process very narrow and far projecting beyond posterior edge of procoxae. Distance between mesocoxae about 3 times and that between metacoxae about 4 times as great as that between procoxae. Metaventrite depressed in the middle and with sharp ridges isolating this depression from anterior and lateral parts. Abdominal ventrite 1 about as long as ventrites 2-4 combined, hypopygidium as long as each of ventrites 2 and 3 and widely rounded at apex. Epipleura of elytra moderately narrow (much wider than antennal club), elevated laterally and gradually narrowing posteriorly.

Legs very narrow and very long. Trochanters of elongate type and very long. Tibiae very thin and longer than femora, sparsely covered with long setae. Femora about 3-4 times as wide as corresponding tibiae. Tarsi with 4 simple subcylindrical tarsomeres, tarsomeres 1-3 comparable in length and each about 2/5 as long as ultimate tarsomere, claws simple to slightly swollen at basal half, narrow and rather long, slightly shorter than each of tarsomeres 1-3.

Family: Anthicidae Latreille, 1819

Fossils of this family are known mostly from Baltic amber (Klebs 1910; Abdullah 1964; Larsson 1978; Spahr

1981; Hieke and Pietrzeniuk 1984 etc.), where the subfamilies Macratriinae Le Conte, 1862; Steropinae Jacquelin du Val, 1863; Tomoderinae Ranadona, 1961 and Anthicinae (including Notoxini Stephens, 1829) have been recorded. The eldest record of this family published before is found in Burmese amber (Cockerell 1917: see below). The further Caenozoic records originated from Palaeocene (? Eocene) Sunchal (Cockerell 1926), boundary of Eocene and Oligocene in Bembridge Marls (Kirejtshuk et al. c in press), Lower Oligocene Florissant shales (Wickham 1910) and Aix (Oustalet 1874) as well as from Miocene Izarra beds (Ariño and Ortuño 1997) and Lowermost French amber (Kirejtshuk & Nel in press). Recent representatives of the family spread in all zoogeographical regions. Larvae and adults of most species are mycetophagous (although few are predaceous) and live in decaying matter of plant origin, frequently in leaf litter and other kinds of debris; some of them are characteristic of the edges of lakes and other bodies of water.

Subfamily: Macratriinae LeConte, 1862

Tribe: Camelomorphini Kirejtshuk, Azar et Telnov trib. nov.

Type-genus: *Camelomorpha* gen. nov.

**Composition.** The new tribe is proposed for the only generic group consisting of one new species.

**Diagnosis.** On the base of the following characters the new genus should be arranged to the subfamily Macratriinae: the "neck" elongate and less than 1/3 as wide as head at eyes, somewhat smoothed and apparently sparsely punctured; "fronto-clypeal" suture invisible; elytra with distinct lateral sulcus between shoulder and epipleural carina; eye edge not emarginate; three terminal antennomeres very long [like that in *Anisotria* Yong, 1984 from Pedilinae Lacordaire, 1859 see below, however very similar also to that in *Macratria* (Macratriinae) and males of *Steropes* Steven, 1806 (Steropinae)].

The tribe Camelomorphini trib. nov. differs from *Macratriini* in the greater length, shape and sculpture of the "neck" (curved and with an apical ring), short and not prognathous head, contiguous pro- and metacoxae, bidentate mandibles, 4<sup>th</sup> palpomere very elongate and with sensory apex almost lateral. It resembles *Macratria* in the longitudinal submarginal sulcus at base of each elytron, very elongate and subparallel elytra, elongated scutellum (mainly sub-quadrate or trapeziodial), elongated prothorax and non-rugulose "neck", lacking "fronto-clypeal" suture. *Protomacratria* Abdullah, 1964 was described without providing with any reliable character to separate this genus from *Macratria*. However, the descriptor pointed out the "lack of pubescence on tibial spurs" and "unusual punctures on the vertex". Besides, he mentioned also "apically constricted prothorax", the description and pictures of the Baltic members of this genus show that the ultimate maxillary palpomere share some similarity with that of *Camelomorpha longicervix* gen. et sp. nov. Nevertheless, the pronotum of representatives of *Protomacratria* in contrast to

the species under description is rather convex (particularly at base) and markedly shorter, “neck” is much shorter and not curved, head elongate and strictly prognathous head, rather convex elytral disks.

The very strong differences in the characters distributed among these three genera considered as members of the subfamily Macratriinae make possible to divide this subfamily into 2 tribes: Macratriini sensu stricto (recent genus *Macratria* Newman, 1838 with world-wide distribution and about 220 species, and fossil genus *Protomacratria* Abdullah, 1964 with two known species, both from Baltic amber) and Camelomorphini trib. nov. here established for the genus *Camelomorpha* gen. nov. The latter differs from Macratriini sensu stricto in the rather short head with long antennae showing strongly enlarged last segments, very long “neck” as well as with lack of distinct, longer narrow part of pronotum, “neck” with distinct ring in the place where it starts to enlarge; metacoxae and procoxae contiguous; mandibles with rather stout bidentate apices, 4<sup>th</sup> palpomere not securiform.

**Description.** Body of medium size (length at least 2.3 mm). Elongate, dorsum with moderately dense and rather thick hairs, underside shortly pubescent. Head densely micropunctate to microgranulate, although “neck” somewhat smoothed. Head with a very “neck”, which looking laterally like slightly S-curved and somewhat depressed in frons; “neck”, with distinct ring in the place where it starts to enlarge. Labrum rather far projecting. Mandibles moderately developed. Antennae rather long, extending behind the level of mesocoxae; antennomeres 9-11 rather long. Pronotum longer than wide, rather bulged in anterior half, narrow in posterior 2/5 and narrowing from base anteriorly. Scutellum elongate. Elytra long; epipleura designated with a line along elytral side, at elytral base the sides strongly turned down forming an almost distinct fold, with paralateral sulcus along basal 1/3 of elytra below shoulders. Eyes on underside as largely represented as on dorsum (not enlarging). Maxillary palpomere 2 subtriangular, palpomere 3 subtransversely oval, palpomere 4 elongate oval (not quite securiform) and with oval sensory place disposed at outer side of apex. Prosternum with anterior foramen displaced ventrally, medially subflattened. Mesocoxae narrowly separated; metacoxae as procoxae (sub) contiguous. Legs rather narrow and very long. All trochanters of heteromeroïd type. Pro- and mesotibiae rather narrow and simple, obliquely subtruncate at apex; with very distinct and rather long narrow spur. Femora slightly enlarged apically and widest in distal third. Tarsi quite characteristic of the family; claws dentate at base.

**Notes.** D.K. Young (1984) described the member of Pedilinae sensu lato with the same shapes and proportions of antennomeres as in the species here described, but the *Anisotria* certainly has all other structures as those in the genus *Pedilus*. He also put in the Pedilinae *Lithomacratria mirabilis* Wickham, 1914b from the Florissant deposits demonstrates the same antennae. However the latter joining is not evident because according to the characters of the description which could be considered, *Lithomacra-*

*tria mirabilis* has clearly not oval pronotum as in *Macratria* and *Anisotria*, but the pronotum widest at base and gently narrowing anteriorly. It means that *Lithomacratria* can be scarcely put to both Anthicidae and Pyrochroidae. Therefore it should be regarded as Tenebrionoidea incertae sedis till the further re-examination of the type specimen of it.

“*Eurygenius*” *wickhami* Cockerell, 1917 seems to be also a member of the subfamily Macratriinae, at least the long and modified antennae and shape of maxillary palpi are similar to those in the species of the new tribe rather than to those in the members of Eurygeniinae, although its not so short head with comparatively short “neck” is similar to the representatives of the tribe Macratriini rather than Camelomorphini trib. nov.

GENUS: **Camelomorpha** Kirejtshuk, Azar et Telnov gen. nov.

Type species: *Camelomorpha longicervix* gen. et sp. nov.

**Etymology.** The name of this new genus consists of the Scientific name “Camelus” (camel) and “morpha” (morph, form, shape); feminine gender.

**Notes.** This genus is represented by the only species, and therefore the description of it overlaps with the description of species (“*descriptio generica specifica*”).

*Camelomorpha longicervix* Kirejtshuk, Azar et Telnov gen. et sp. nov.

Figures 42-48; Plate 4, figures E-F.

**Etymology.** The epithet of this new species is formed from the Latin “*longus*” (long) and “*cervix*” (neck).

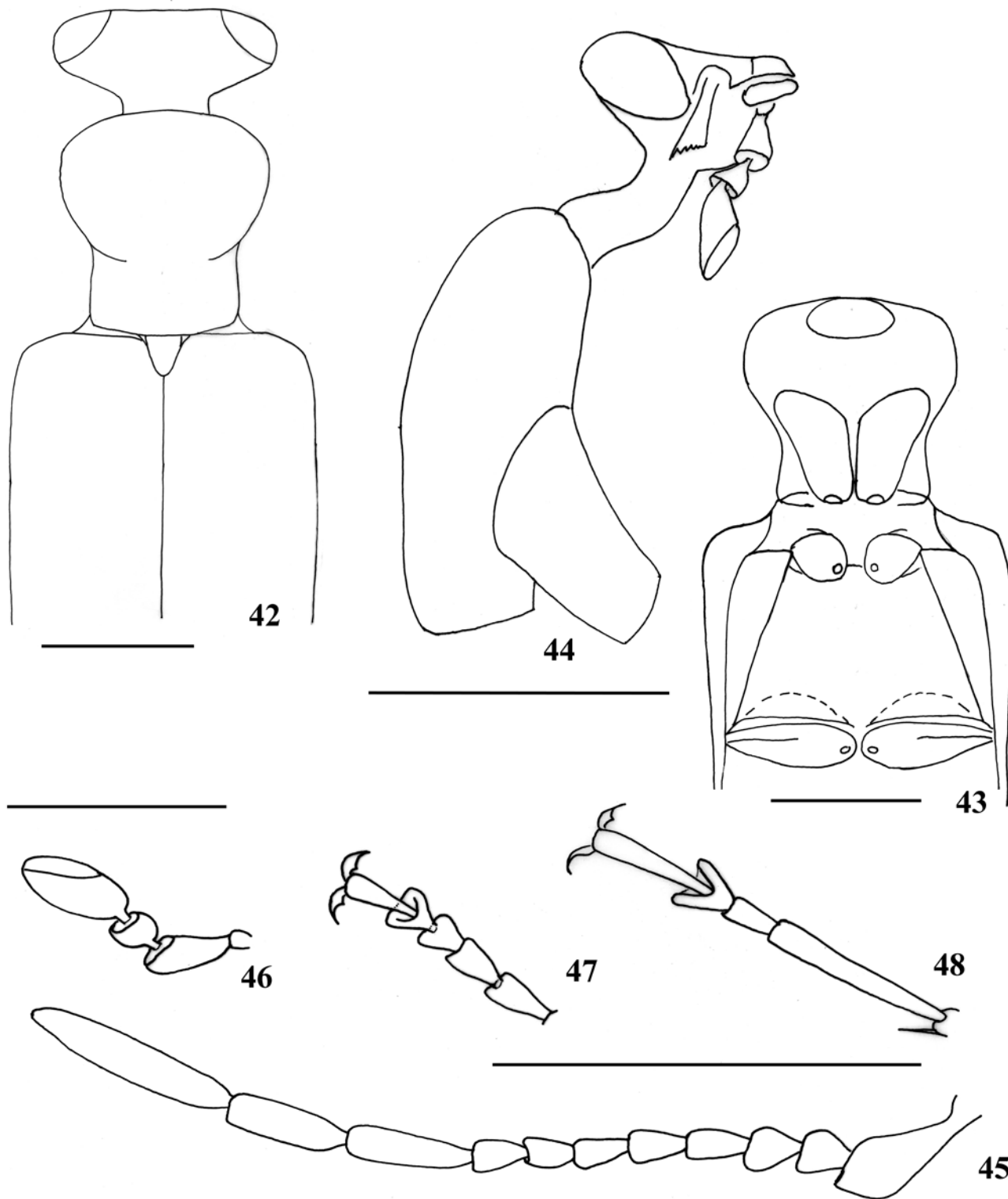
**Holotype.** Specimen no. “846”, sex undefinable, Azar collection, housed provisionally in the Muséum National d’Histoire Naturelle, Paris. No other specimens available. [the almost clear beetle with cut distal parts of abdomen and elytra, posterior legs (but left tarsus completely and a part of right tarsus are present), left mesotibia and mesotarsus, distal part of right tarsus is included in a small amber piece put in the small glass box with epoxide resin. It can be supposed that the integument of prothorax and head in place of “neck” and in frontal place partly deformed because of condensation of amber.].

**Type locality and horizon.** Lower Cretaceous, Hammana/Mdeyrij, Caza Baabda, Mouhafazet Jabal Loubnan (Central Lebanon).

**Description.** Length 2.3, width 0.7, height 0.6 mm. Elongate, rather convex both dorsally and ventrally at thorax but subflattened both dorsally and ventrally at anterior part of prothorax and head; blackish with dark chestnut brown appendages and distal present part of elytra; mostly mat; dorsum with moderately dense and rather thick, suberect, rather conspicuous, reddish grey hairs about 6 times as long as distance between their insertions (part of hairs on pronotum dark at base and whitish distally; these hairs mixed with reddish grey ones; hairs on frons partly reduced); underside with much shorter and subrecumbent, stout hairs, 1.5-2.0 times as long as distance between their inser-

tions, but anterior and lateral part of prosternum with hairs similar to those on dorsum; besides the mentioned hairs, there are some very long suberect on head, particularly on frons and on underside at ring between “neck” and widened genal part of head.

Head densely micropunctured to microgranulate at frons and more distinctly microgranulate at base (before neck), although “neck” somewhat smoothed and apparently sparsely punctured with punctures much smaller than eye facets in diameter. Pronotum at apex as sculptured as head



Figures 42-48. Anthicidae: *Camelomorpha longicervis* gen. et sp. nov.: 42 – body, dorsal; 43 – thorax, ventral; 44 – head and prothorax, lateral; 45 – antennae, dorsal; 46 – maxillary palpus, ventral; 47 – protarsus, dorsal; 48 – metatarsus, dorsal. Scale bars for figures 42-44 – 0.35 mm; for figures 45, 47, 48 – 0.8 mm; for figure 46 – 0.2 mm.

base, but narrowed part of pronotum and elytra with more or less distinct punctures, less than  $\frac{1}{2}$  as large as eye facets in diameter, interspaces between punctures somewhat narrower on pronotum and broader on elytra, apparently with dense microreticulation to alutaceous. Prosternum microgranulate at sides and with rather dense and quite distinct punctures along the middle, about  $\frac{1}{2}$  as large as eye facets in diameter, interspaces between them  $\frac{1}{3}$ - $\frac{1}{2}$  as large as a puncture diameter, densely microreticulated to alutaceous. The middle of metaventrite about as punctured and sculptured as prosternum, but at sides punctures becoming larger, denser, shallower and less distinct, interspaces between them somewhat reticulated. Abdominal ventrites with somewhat smaller and distinct punctures, interspaces between them nearly alutaceous.

Head with a very long "neck", apparently about as long as prosternum before procoxae and as long as frons, the latter strongly narrowing to transversely abrupt anterior edge, "fronto-clypeal" suture invisible; "neck" somewhat less than  $\frac{1}{3}$  as wide as head at eyes, with distinct ring in the place where it starts to enlarge. Labrum apparently subquadrangular, somewhat wider than long and with some setae oriented anteriorly. Mandibles somewhat exposed from under frons and with rather stout bidentate apices. Antennae with scape moderately bulging apically and slightly longer than antennomeres 2 and 3 combined; antennomeres 2 and 3 subequal in length and similar in oval shape; antennomeres 4-8 subequal in length and somewhat longer than antennomeres 2 and 3; antennomeres 9 and 10 about 2.5 times as long as each of antennomeres 4-8, subcylindrical to subconical; ultimate antennomere subcylindrical and narrowing only at rounded apex, more than 1.5 times as long as each antennomeres 9 and 10. Pronotum about 1.5 times as long as wide, rather bulged in anterior half and medially evenly convex at base; rather narrow in posterior  $\frac{2}{5}$  and narrowing from base anteriorly, then from the narrowest place it gently widening anteriorly to widely rounded anterior edge. Scutellum nearly twice as long as wide and widely rounded at apex. Elytra with cut distal parts (probably their  $\frac{1}{3}$ ), and without these parts about twice as long as wide, somewhat subflattened at base and slightly convex distally; epipleura designated with a line along elytral side (about as wide as antennomeres 4-8), at elytral base the sides strongly turned down forming an almost distinct fold and posteriorly this fold becoming less compressed and then becoming as a steeply sloping (subvertical) sides, besides, with clear paralateral sulcus along basal  $\frac{1}{3}$  below shoulders.

Mentum invisible clearly, apparently subtrapezium-shaped, widest at base and about as wide as scape long. Gular sutures invisible (apparently absent). Labial palpi apparently very small and, therefore, invisible. Prosternum with length before procoxae somewhat shorter than the latter; procoxae subtriangular with longest outer edge and rather projecting (apparently closed posteriorly). Distance between mesocoxae less than half of flagellomere width; metacoxae as procoxae contiguous. Mesoventrite invisible clearly, but apparently it shorter than scape and gently convex medially. Metaventrite medially gently convex, with a

distinct longitudinal fossa before metacoxae, about 3 times as long as mesoventrite and about twice as long as procoxae; premetacoxal lines well expressed and an arcuate depression before each metacoxa allowing metafemur to move anteriorly. Metacoxae transverse and very narrowly separated to contiguous. Abdominal ventrite 1 about as long as procoxa and only a basal part of abdominal ventrite 2 present.

Legs well developed. All trochanters narrow, but distinctly of heteromeroid type. Pro- and mesotibiae similar in shape and size, very slightly compressed and very slightly longitudinally curved, and evenly covered with rather long setae, subequal in width to slightly narrower than ultimate maxillary palpomere, slightly longer than antennomeres 9 and 10 combined, obliquely subtruncate at apex; with very distinct and rather long narrow spur, but without outer borders. Femora somewhat more than twice as wide as tibiae. Tarsi rather long; protarsomeres 1 and 2 gradually widening apically (much narrower than tibiae) and about twice longer than wide; protarsomere 3 markedly shorter and somewhat wider, slightly longer than wide, protarsomere 4 subtriangular, widest and widely lobed, protarsomere 5 somewhat longer than protarsomere 1; metatarsomeres 1 and 2 rather narrow, the first comprising about half of total tarsal length and the latter almost a fourth as long as the first; metatarsomere 3 very short and widely lobed, metatarsomere 4 about  $\frac{3}{5}$  as long as metatarsomere 1; claws distinctly dentate at base. Protarsus somewhat wider than antennal club, meso- and metatarsi about as wide as antennal club, their tarsi moderately big and strongly toothed at base.

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