New beetles of Polyphaga (Coleoptera, Polyphaga) from Lower Cretaceous Lebanese amber

Alexander G. Kirejtshuk, Dany Azar, Paul Tafforeau, Renaud Boistel & Vincent Fernandez

Abstract: This paper deals with the description of *Cretonodes antounazari* gen. et sp.nov. (Cretonodini trib.nov., oldest representative of the subfamily Trinodinae; Dermestidae), *Rhizophtoma elateroides* gen. et sp.nov. (first member of Rhizophtominae subfam.nov. and oldest representative of Monotomidae), and *Archelatrius marinae* gen. et sp.nov. (oldest representative of the Latridiinae; Latridiidae). Short reviews of known fossil records of the mentioned families are given.

Key words: Dermestidae, Latridiidae, Lebanese amber, Monotomidae, new taxa, Rhizophtominae.

Santrauka: Šioje publikacijoje aprašoma *Cretonodes antounazari* gen. et sp.nov. (Cretonodini trib. nov., kuris yra seniausias pošeimio Trinodinae; Dermestidae atstovas), *Rhizophtoma elateroides* gen. et sp.nov. (pirmas pošeimio Rhizophtominae subfam.nov. atstovas ir seniausias šeimos Monotomidae vabzdys) ir *Archelatrius marinae* gen. et sp.nov. (seniausias iš Latridiinae; Latridiidae). Trumpai aptariami žinomi minimų šeimų fosiliniai pavyzdžiai.

Raktiniai žodžiai: Dermestidae, Latridiidae, Libano gintaras, Monotomidae, nauji taksonai, Rhizophtominae.

Introduction

This paper is presenting the fifth contribution to the knowledge of the Coleoptera fauna from Lower Cretaceous Lebanese amber (Kushel & Poinar 1993; Lefebvre et al. 2005; Kirejtshuk & Azar 2008; Kirejtshuk et al. 2009), and is devoted to its families, the oldest representatives of which are frequently found in Lebanese inclusions. The families here considered seem to represent rather archaic groups of Cucujiformia, although all of them have rather specialized Recent relatives. The families considered in the paper are provided with a short necessary review of data on systematics and historical development. More detailed information on these coleopterous families in the fossil record can be found in the catalogue by Ponomarenko & Kirejtshuk (2008). All new genera here described are represented by a single species and, therefore, their definition considerably overlaps with the description of species ("descriptio generica specifica").

Material and methods

The oldest amber with many biological inclusions originated from Lebanon (Azar 1997) and also from surrounding territories (Jordan, Israel: e.g. Bandel et al. 1997). 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). In 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; Homsiyyeh-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 imbedded in Canada balsam between two glass cover slips as described by Azar et al. (2003b); or in a glass cube made by cover slips. For their study the usual optic equipment was used, in particular the stereomicroscope Olympus SCX9 and inverted microscope Olympus CK 40 in the Paris museum, and also the stereomicroscope Leica MZ 16.0 in the St. Petersburg institute.

One paratype specimen of *Rhizophtoma elateroides* sp.nov. was scanned and three-dimensionally reconstructed using phase contrast X-ray synchrotron imaging (according to the protocol published by Lak et al. 2008) before it was finally embedded in Canada balsam between two cover slips. All the experiments were performed on the Beamline ID19 at the European Synchrotron Radiation Facility (ESRF) in Grenoble (France). The following description is based on a 3D-reconstruction, obtained by local propagation phase-

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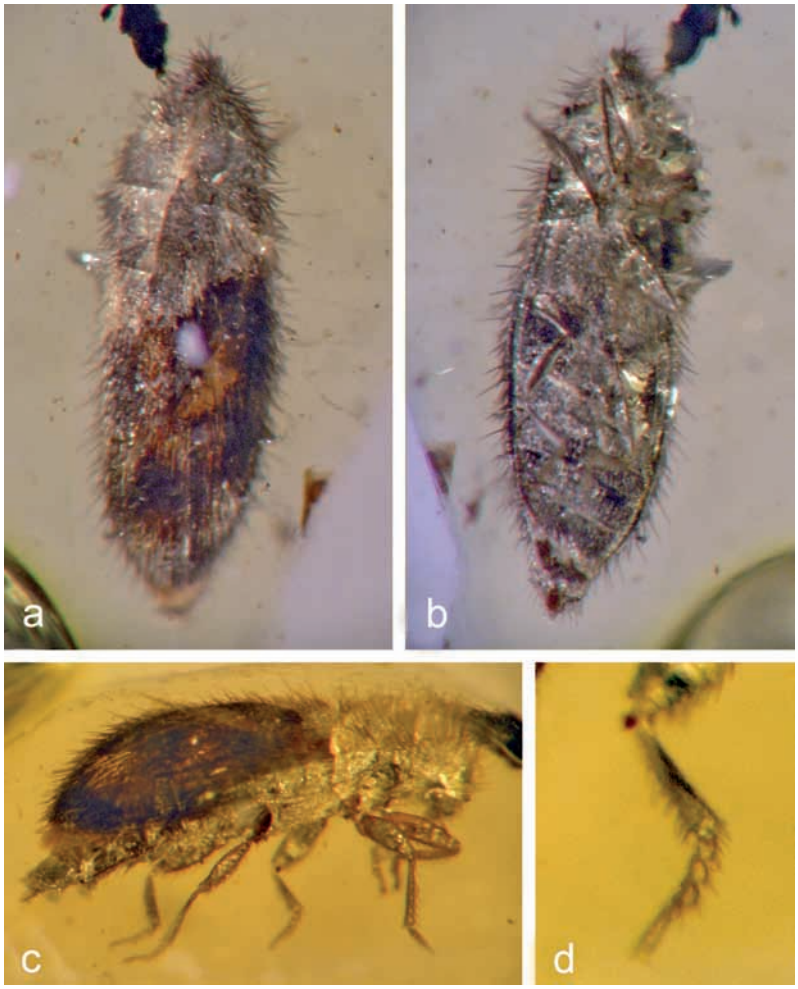


Fig. 1: *Cretonodes antounazari* gen. et sp.nov.: (**a**) body of holotype, dorsal; (**b**) ibid., ventral; (**c**) ibid., lateral; (**d**) mesotibia and tarsus, lateral.

contrast microtomography (TAFFOREAU et al. 2006; LAK et al. 2008). The parameters of the scan were as follows: monochromatic beam set at an energy of 20.5 keV using a multilayer monochromator, 15mm of propagation distance between the sample and the detector, 25 mm thick YAG scintillator screen, isotropic voxel size of 1.03 µm, 2500 projections of 0.3 s each taken over 360 degrees. After tomographic reconstruction and 8-bit conversion, the volume was segmented in 3D using the software VGStudioMax 2.0 (Volume Graphics, Heidelberg, Germany), in order to virtually extract the specimen from its amber.

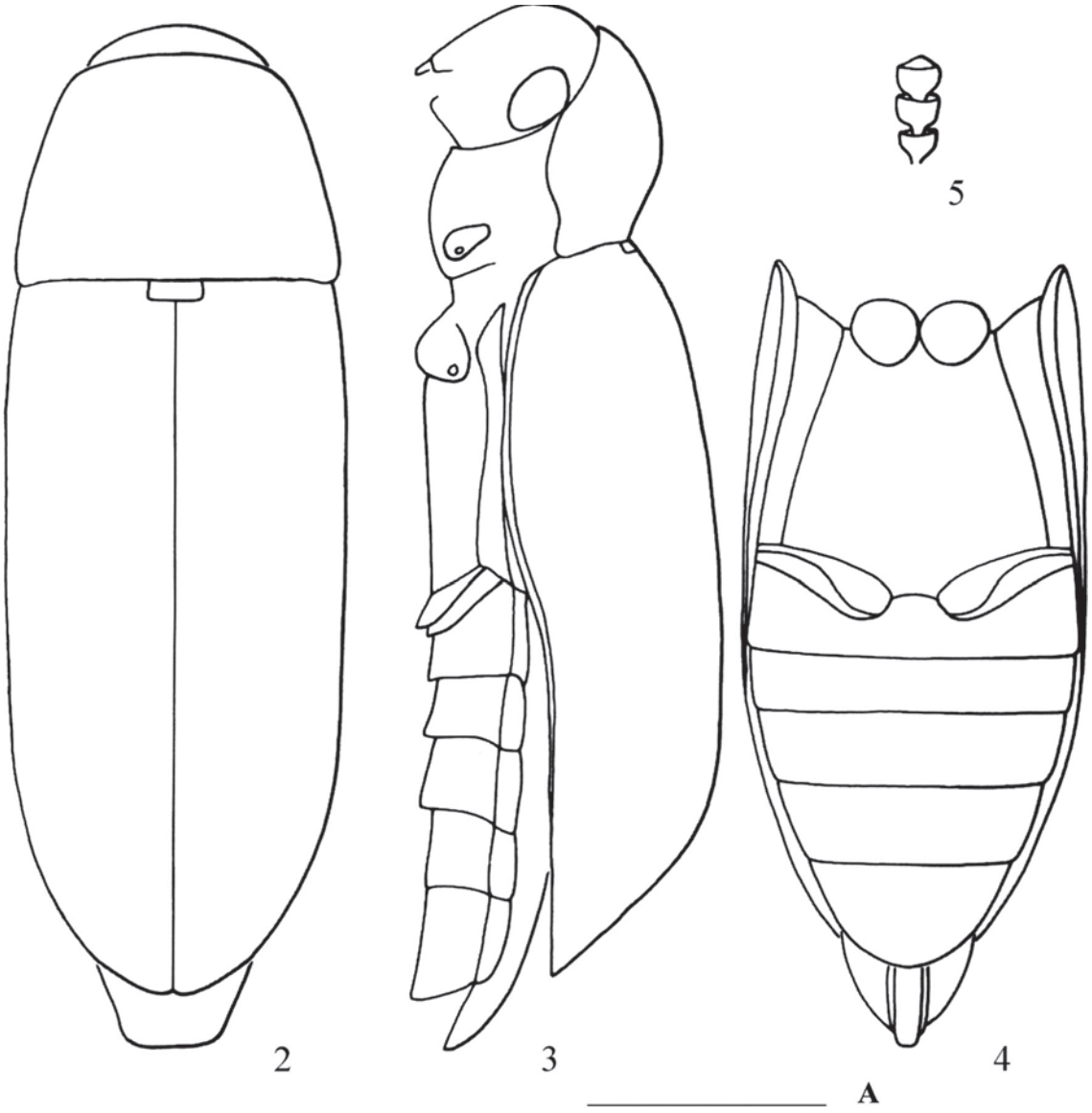
The material under consideration is temporally deposited in the Laboratoire de Paléontologie, Muséum National d'Histoire Naturelle, Paris, awaiting the creation of a national natural history museum in Lebanon.

Suborder Polyphaga
Infraorder Cucujiformia LAMEERE, 1938
Superfamily Dermestoidea LATREILLE, 1804
Family Dermestidae LATREILLE, 1807

This family is characterized by the comparatively small head deflected and rather inserted into the prothorax, single median ocellus on vertex, more or less developed antennal club, posterior angles of pronotum usually somewhat projecting posteriorly and complete lateral carina of prothorax, procoxae mostly conical and their cavities open posteriorly, excavate and frequently (sub-) contiguous metacoxae, comparatively wide metepimera and simple tarsomeres. This family has been recorded from the Lower Cretaceous Burmese amber (COCKERELL 1917; RASNITZIN & ROSS 2000), however, most findings of it originated from the Cenozoic (mostly from Baltic amber) and are summarized in (LARSSON 1978; SPAHR 1981; HÁVA & PROKOP 2004; PONOMARENKO & KIREJTSHUK 2008). Most fossil species were put into the genera *Dermestes* LINNAEUS, 1758 (Lower Miocenian Radoboj: HEER 1847; Lower Oligocene Florissant: WICKHAM 1912); *Attagenus* LATREILLE, 1802 (Lower Miocene Dominican amber: HÁVA et al. 2006a, 2006b; Lower Oligocene Florissant: SCOODER 1900; WICKHAM 1913; Upper Oligocene or Middle Miocene Salzhausen: C. HEYDEN & L. HEYDEN 1865); *Attagenus* LATREILLE, 1802; *Cryptorhopalum* GUÉRIN-MÉNEVILLE, 1838 (Lower Miocene Dominican amber, and Oligocene-Miocene amber from Chiapas: BEAL 1972; HÁVA & PROKOP 2004) and *Trinodes* DEJEAN, 1821 (Upper Eocene Baltic amber: HAVA & PROKOP 2006). Further species described are also *Amberoderma beali* HAVA & PROKOP, 2005 from Dominican amber; *Miocryptorhopalum kirkbyae* PIERCE, 1960 from the Middle Miocen of Moja, and *Orphilus dubius* WICKHAM, 1912 from the Lower Oligocene of Florissant. The species here described is the oldest representative of the family at this time. Another specimen from Lebanese amber still waits for study and description.

Subfamily Trinodinae CASEY, 1900

This subfamily can be diagnosed due to (sub) erect long and stout hairs on dorsum, 11-segmented antennae with 1-6-segmented club, pronotum with paralateral striae, prohypomera without depressions for reception of antennal club, prosternum somewhat projecting anteriorly. Till now this subfamily is known as fossils only from Baltic amber (*Trinodes*: LARSSON 1978; SPAHR 1981; HÁVA 2003; HÁVA & PROKOP 2004, 2006 etc.). Among inclusions of the lowermost Eocene French amber more than 30 specimens of this subfamily were recently found and all of them belong to the genera quite distinct, but rather related to those represented in the



Figs 2-5: *Cretonodes antounazari* gen. et sp.nov., holotype: (**2**) body, dorsal; (**3**) ibid., lateral; (**4**) metathorax, elytra and abdomen, ventral; (**5**) antennal club. Scale bar: A = 0.5 mm.

Recent fauna. At the same time the species here described is very isolated among the members of the subfamily and it could be separated from all of them as a particular tribe.

Tribe Cretonodini Kirejtshuk & Azar, trib.nov.

Type genus: *Cretonodes* gen.nov.

Diagnosis: The new species under description has the following diagnostic peculiarities: very elongate and strongly convex body, very narrowly separate pro- and mesocoxae (subcontiguous), narrowly separate metacoxae, very narrow and very long legs. All these characters put it in a very distinct and isolated position among all genera of the subfamily. Therefore it makes possible to regard this species not only as a separate genus, but also as a separate tribe.

Genus *Cretonodes* Kirejtshuk & Azar, gen.nov.

Type species: *Cretonodes antounazari* sp.nov.

Etymology: The name of this new genus is formed from the name of the Cretaceous geological period and the generic root ("nodes") of the subfamily's genotype.

Cretonodes antounazari Kirejtshuk & Azar, sp.nov. (Figs 1, 2-5)

Holotype: "939", ♂. The complete specimen, with some gas layers and very small vesicles because of coarse microsculpture and pubescence in the very small bar of amber (length c. 3 mm, width c. 2 mm), is embedded in Canada balsam in a box of glass cover slips on the microscope glass. A piece of organic matter is in the front of specimen from left and another piece at the right side of distal third of the elytra. The beetle seems to be somewhat laterally compressed and somewhat laterally

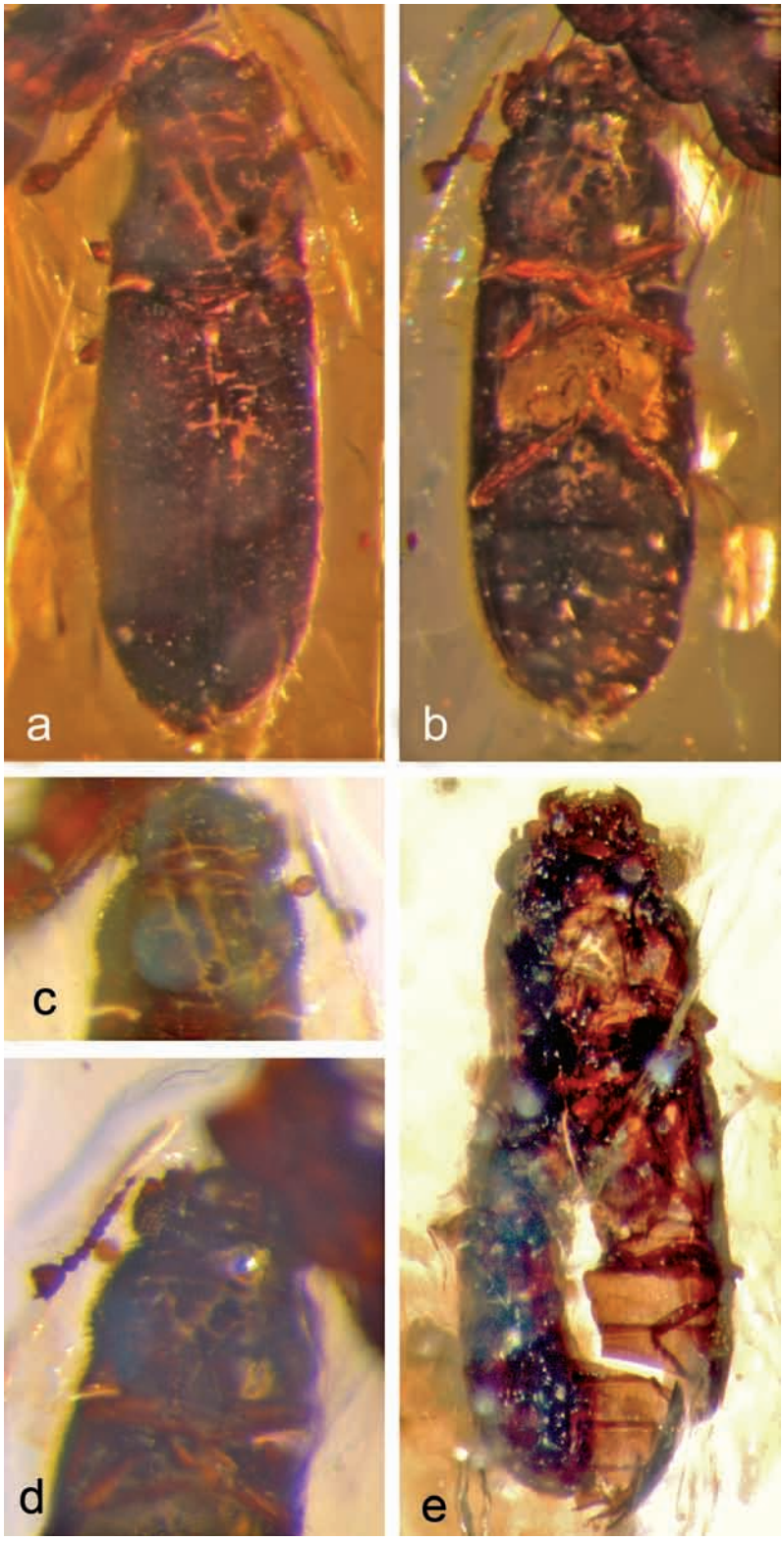


Fig. 6: *Rhizophtoma elateroides* gen. et sp.nov.: (**a**) body of holotype, dorsal; (**b**) ibid., ventral; (**c**) anterior part of body, dorsal; (**d**) ibid., ventral; (**e**) body of paratype ("845 E"), ventral.

biased along the median plane, and now it looks narrower and its head is rather turned to the left, and some structures of it are not clearly visible because of dense pubescence and gas layer associated with hairs.

Etymology: The epithet of this new species is devoted to Antoun AZAR, who supported the second author when he started his scientific career.

Description: Length 2.0 mm, width 1.1 mm, height at least 0.6 mm. Elongate, strongly convex dorsally and moderately convex ventrally; subunicoloured dark brown with slightly lighter abdominal apex and appendages; dorsum with very dense, erect, rather long and stout dark brown hairs of two types: about as long as antennal club one is and the other is twice as long; besides, on elytra there are two obliquely transverse stripes with light hairs of the same types; thoracic underside with dense and rather long subrecumbent hairs, but somewhat shorter than shorter ones on dorsum; abdominal ventrites with recumbent hairs about half as long as those on thoracic underside.

Head and pronotum with distinct dense punctures, about half 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. Metaventrite and ventrites with clear punctures slightly smaller than facets in diameter, interspaces between them somewhat narrower than a puncture diameter and smooth.

Head oval and strongly declined (hypognathous) and slightly exposed dorsally, somewhat narrower than pronotum, with moderately large, vertical and finely faceted eyes, somewhat convex and frons somewhat projecting downwards. Labrum well exposed and transversely subquadrangular. Antennae slightly longer than head wide, apparently 11-segmented with three-segmented club composing about 2/5 of total antennal length, scape apparently rather small, two preapical antennomeres somewhat shorter than ultimate one; antennomeres covered with sparse, rather short and very stout hairs. Pronotum not wider than combined elytral base, slightly wider than long, strongly vaulted at disk and rather steeply sloping at sides; its anterior edge gently convex and posterior one shallowly emarginate, sides looking like continuation of anterior edge, lateral carina distinct. Scutellum rather small, strongly transverse and subquadrangular, about three times as wide as long. Elytra markedly more than twice as long as wide combined, longest at suture and subparallel-sided and arcuate in posterior 1/3, rather convex along the middle and steeply sloping and somewhat declined on ventral sides

(Lateral sides visible from below wider than distance between lateral edges), with weak shoulders, adsutural lines not visible because of pubescence and gas layer, their apices jointly subacute. Pygidium with widely truncate apex.

Most part of head underside, prosternum and mesoventrite not visible because of declination of head and pubescence with gas layer. Maxillary palpi moderately developed and with last palpomere subcylindrical and almost twice as long as thick, and about 1.5 times as long as ultimate antennomere. Procoxae apparently comparatively small; distinctly transverse, slightly projecting downwards and contiguous or subcontiguous. Mesocoxae transversely oval, slightly projecting and extremely narrowly separated to subcontiguous. Metaventrite strongly medially convex, but with a triangular depression at median part of metacoxae, posterior edge between coxae arcuately to angularly excised. Distance between metacoxae about as great as antennal club wide. Metepisterna exposed along the whole length, comparatively narrow and slightly widening anteriorly. Metacoxae moderately oblique, with well raised and somewhat declined downward femoral plate, externally reaching tergites. Abdominal ventrites 1-3 comparable in length; ventrite 4 somewhat longer than previous ones and hypopygidium about 1.5 times as long as ventrite 4 and rounded at apex. Epipleura rather narrow and elevated laterally, very gradually narrowing to the level of end of metaventrite and strongly narrowed behind it.

Legs well developed, quite narrow and long, diffusely covered with comparatively short and stout setae (particularly short on tarsi). Tibiae rather compressed (partly as a sequence of fossilization) and slightly widened apically, about as long as antenna and scarcely wider than antennal club. Femora of usual shape and moderately compressed, 3.0-3.5 times as wide as tibiae. Tarsi moderately long, about 2/3 as long as tibiae, tarsomeres 1-4 narrowly lobed (protarsomeres somewhat wider tha meso- and metatarsomeres), tarsomeres 1-3 comparably in length, each of them about twice as long as tarsomere 4 and about half as long as tarsomere 5, tarsomeres 1-4 with short and stout setae at apex of lobes, ultimate tarsomere rather narrow; claws simple, narrow and not long, about 1/4 as long as ultimate tarsomere.

Family Monotomidae Laporte 1840

This family is characterized by the very elongate and rather small body, prognothous head with quite peculiar antennae and labrum concealed with frons, particularly 1-2-segmented club (in the last case the ultimate antennomere is more or less inserted into penultimate one), procoxae with exposed trochantin, elytra with clear epipleura and truncate at apices, the pygidium remaining uncovered, puncturation of elytra frequently seriate or striate, abdominal ventrite 1 at least twice as long as following one, penultimate tarsomere smallest etc. This family has been recorded only from Baltic amber (genera *Europs* Wollaston, 1854 and *Rhizophagus* Herbst, 1793: Helm 1896; Larsson 1984; Klebs 1910), although *Monotoma resinorum* Hope, 1842 was described from copal.

Subfamily Rhizophtominae Kirejtshuk & Azar, subfam.nov.

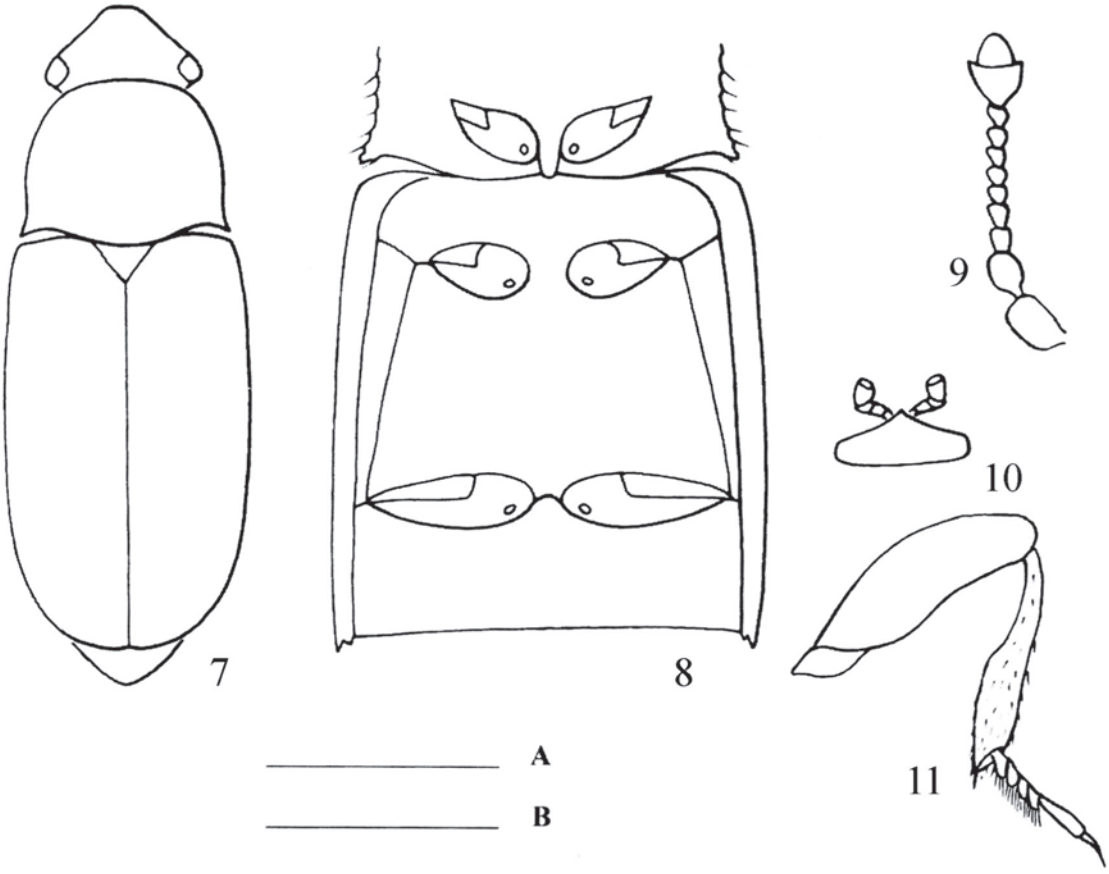
Type genus: *Rhizophtoma* gen.nov.

Diagnosis: This subfamily manifests a combination of characters of two other subfamilies, which are recognised in the family Monotomidae, namely the Monotominae (setose and coarsely microreticulated integument of dorsum, crenulated pronotal side) and the Rhizophaginae Redtenbacher, 1845 (transverse procoxal cavities, absence of both neck constriction and transverse suture on anterior part of gular region). At the same time the new species under description, in contrast to all members of in the formerly recognised subfamilies, has the laterally closed mesocoxal cavities, pronotum widened posteriorly and with strongly projecting posterior angles, and also narrowly lobed tarsi. Such a constitution of the characters forces to review the traditional division of the family into two subfamilies by adding one new subfamily, which for now includes only one fossil species. Besides, *Rhizophtoma elateroides* gen. et sp.nov. is characterised also by the 11-segmented antennae with 2-segmented club, tarsal formula 5-5-5, rather conspicuous pubescence on dorsum. Another peculiar feature of the new subfamily is the diffuse puncturation of elytra (without a trace of longitudinal rows), while in most other Monotomidae the elytral puncturation demonstrates more or less expressed longitudinal rows of punctures. The lack of submetacoxal lines, somewhat elongate trochanters and more or less rugose dorsal integument are also important characters of the new subfamily, although each of these characters occurs in some groups of the Monotominae.

Genus *Rhizophtoma* Kirejtshuk & Azar, gen.nov.

Type species: *Rhizophtoma elateroides* sp.nov.

Etymology: The name of this new genus is formed from the roots of the genera *Rhizophagus* and *Monotoma*, type genera of two other subfamilies of the family Monotomidae, referring to a partly intermediate conditions of some characters.



Figs 7-11: *Rhizophtoma elateroides* gen. et sp.nov., holotype: (**7**) body, dorsal; (**8**) base of prosternum, undersuide of pterothorax, epileura and abdominal ventrite 1, ventral; (**9**) – antenna; (**10**) mentum and labial palpi, ventral; paratype: (**11**) left posterior leg, ventral. Scale bars: A = 0.33 mm (Fig. 7); B = 0.16 mm (Figs 8-11).

Rhizophtoma elateroides Kirejtshuk & Azar, sp.nov. (Figs 6, 7-11, 12)

Holotype: "845D", probably ♀. The clear complete beetle, with most part of the right antenna and left posterior wing detached, is included in a small and thin amber plate (length c. 2.5 mm, width c. 1.3 mm). This amber plate is embedded in Canada balsam between round glass slides.

Paratype: "845A-E-F", probably ♂. The beetle cracked obliquely along its body and is missing the median part of pronotum, most of part of elytra (almost completely left elytron) as well as the right anterior leg, right meso- and metatibiae and tarsi. It is included in a flat and thin amber plate (length c. 5.0 mm, width c. 3.0 mm) together with the flat layer of a dense net of organic matter. This amber plate is embedded in Canada balsam between oval glass slides.

Paratype: "1512", probable ♀. The beetle is complete present in a rectangular block of amber. The amber piece containing the paratype is clear but presenting some gas bubbles and fractures rendering the observation of some structures difficult. Before final embedding in Canada balsam between two cover slips, this amber specimen was scanned and three-dimensionally reconstructed using phase contrast X-ray synchrotron imaging.

Etymology: The epithet of this new species refers to some resemblance of it to some click beetles.

Description: Holotype (♀). Length 1.1 mm, width 0.3 mm, height c. 0.1 mm. Elongate, moderately convex dorsally and subflattened ventrally; dorsum dark chestnut brown, underside lighter and appendages nearly reddish; dorsum without a clear shine; underside somewhat shining; dorsum with moderately conspicuous and subrecumbent dark hairs about 2.5 times as long as distance between their insertions; underside with very slightly conspicuous and fine pubescence.

Head with sparse and fine punctures, very densely and finely microreticulated. Pronotum and elytra with moderately dense, shallow, partly indistinct, diffuse and irregular punctures about as large as eye facets in diameter, interspaces between punctures about a puncture diameter and somewhat alutaceous, but at sides punctuation becoming larger and denser, and very narrow interspaces densely and finely microreticulated. Underside with very sparse and small indistinct punctures (visible mostly on abdomen) and finely microreticulated to alutaceous between.

Head transversely subtriangular, slightly and evenly convex dorsally, apparently somewhat shorter than the distance between moderately large eyes with moderate-

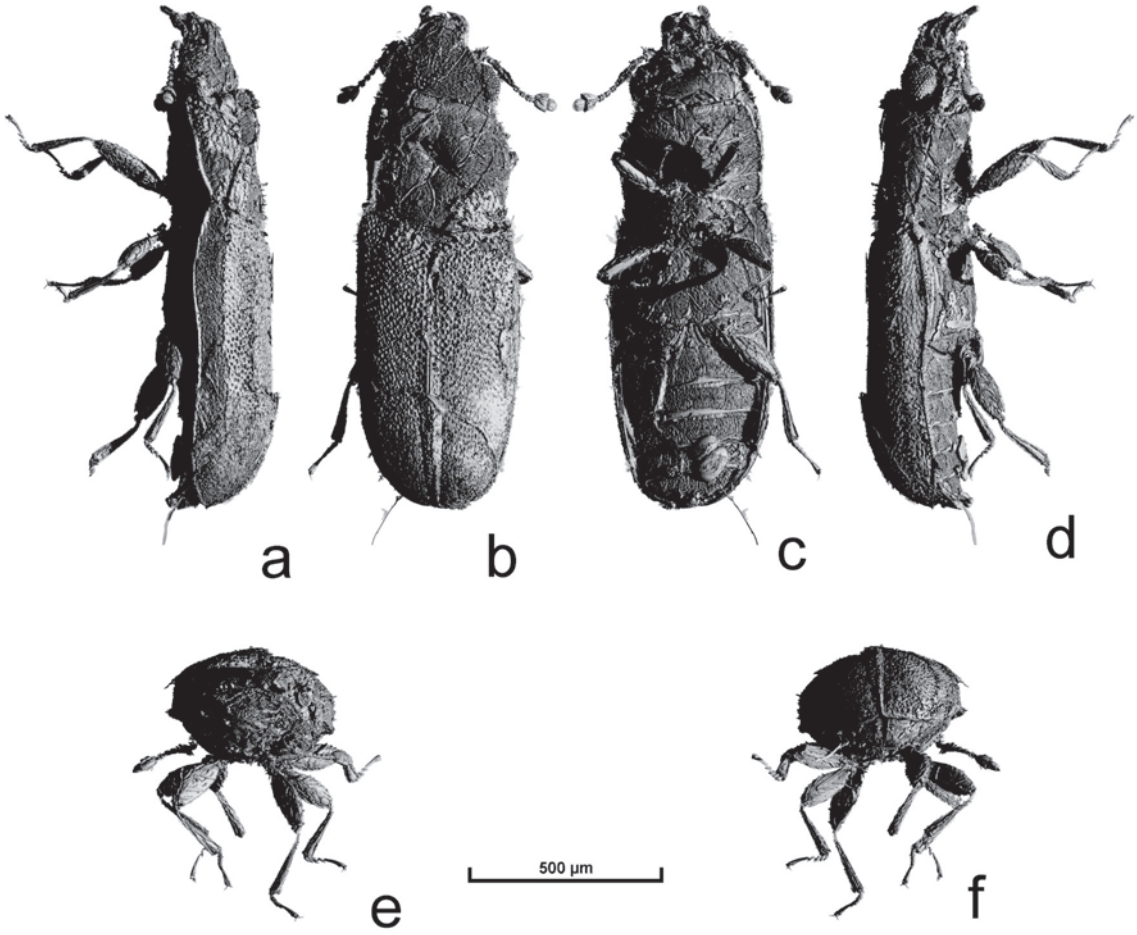


Fig. 12: *Rhizophtoma elateroides* gen. et sp.nov.: (**a**) body of paratype ("1512"), left; (**b**) ibid., dorsal; (**c**) ibid., ventral; (**d**) ibid., right; (**e**) ibid., anterior; (**f**) ibid., posterior.

ly large facets, distance between them about four times as great as width of one eye; antennal insertions located at anterior edge of frons and covered with a dilatation of frons. Labrum not clearly visible. Mentum comparatively large, subpentagonal and almost 2.5 times as wide as long. Labial palpi three-segmented, ultimate palpomere slightly longer than thick. Ultimate maxillary palpomere more than twice as long as thick, subcylindrical to subconical. Antennae 11-segmented, with flagellum submoniliform and two-segmented antennal club, with sparse setae, moderately long, slightly longer than head wide at eyes; scape oval bulbous and somewhat longer than thick, markedly longer than penultimate antennomere; antennomere 2 suboval and about as long as thick; antennomeres 3-9 subconical and thickened apically; antennomeres 10 cap-shaped and thickest in antennae; antennomere 11 markedly narrower than previous one, subconical and rounded at apex. Pronotum subhemicircular, with arcuate sides gently transiting to anterior edge, about ¾ as long as wide, slightly and evenly convex at disk and gently sloping to crenullate lateral carina, posterior angles looking like teeth of crenellation, posterior edge bi-sinuate. Scutellum transversely triangular and with nearly distinct top, nearly twice as wide as long. Elytra somewhat less than twice as long as wide combined, moderately convex along the middle and moderately steeply sloping at sides, subparallel-sides to slightly arcuate in anterior 3/4 and behind gently narrowing to conjointly rounded apices, adsutural lines absent and sutural angle scarcely expressed. Pygidium mostly exposed from under apices of elytra.

Eyes on underside somewhat larger than on dorsal side. Underside of head smooth and with somewhat expressed antennal grooves along eye edges and gular sutures, but without transverse suture. Prosternum slightly medially vaulted, its length before procoxae about half as long as metaventrite; process very narrow and not projecting beyond posterior edge of prohypomeres. Procoxal cavities transverse and closed posteriorly. Trochantins exposed in all coxae. Distance between procoxae subequal to and that between metacoxae slightly greater than that between mesocoxae and half as great as antennal scape thick. Mesoventrite smoothed and somewhat deepened in comparison with plane of prosternum and metaventrite. Mesocoxae transversely suboval. Metaventrite slightly convex along the middle and without longitudinal suture or line, posterior edge between coxae angularly excised. Metepisterna moderately narrow and gradually widening anteriorly. Abdominal ventrite 1 about 1.5 times as long as each of ven-

Fig. 13: *Archelatrius marinae* gen. et sp.nov.: (**a**) body of holotype, dorsal; (**b**) ibid., ventral.

trites 2-4; hypopygidium shortest and widely rounded at apex. Epipleura of elytra narrow (somewhat narrower than antennal club), nearly complete and gradually narrowing posteriorly.

Legs moderately narrow and very long. Trochanters slightly elongate. Tibiae very thin and slightly longer than femora, with sparse setae and distinct spurs. Femora of usual configuration, thickest at the middle and about 2.0-2.5 times as wide as corresponding tibiae; metafemur with gently convex posterior edge. Tarsi about 2/3 as long as tibiae (metatarsus longer than pro- and mesotarsi), tarsomeres 2-4 narrowly lobed and short, tarsomeres 5 about as long as previous ones combined, claws very long and thin, about as long as tarsomere 5, oriented distally and with a clear empodium between.

Variation: Male paratype with the same body size as the holotype and the female paratype (length 1.3 mm, width 0.4 mm). Metafemur somewhat curved and with concave posterior edge. Metatibia somewhat curved before the middle and dilated in posterior half. Pronotal sides of both paratypes almost straight to very slightly sinuate at posterior angles.

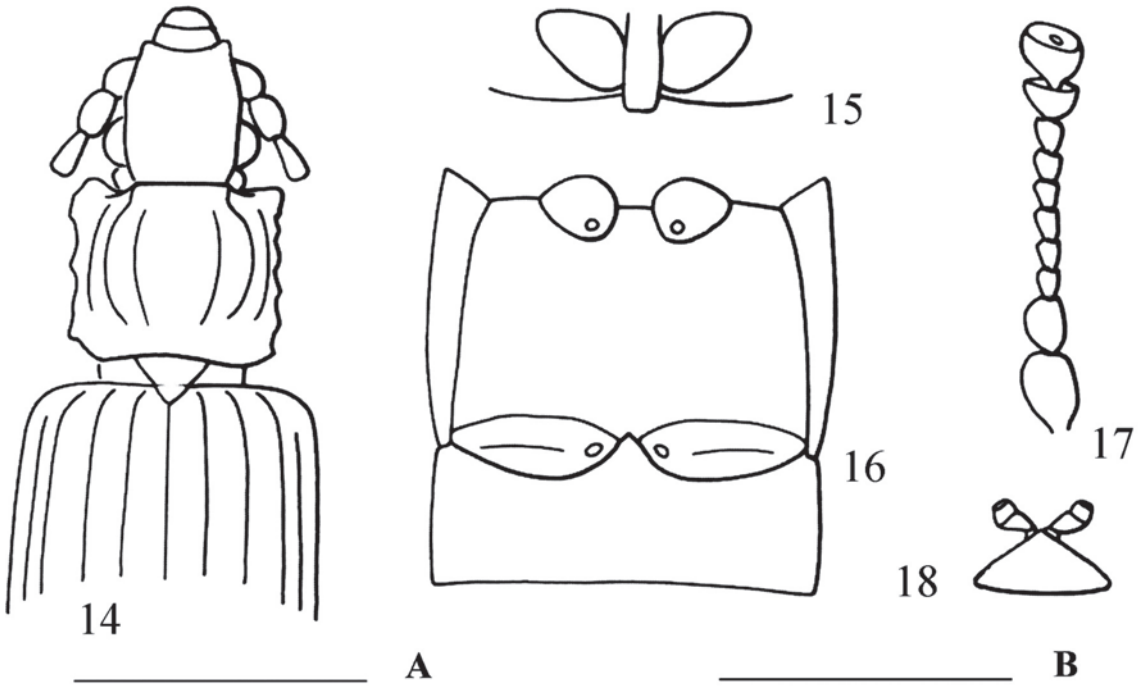
Notes: The holotype was chosen because of a better preservation. It seems to represent a female because of the lack of sexual characters in posterior legs, which is manifested in the paratype.

Family Latridiidae Erichson, 1842

This family is characterized by the rather small body size with coarse puncturation and sculpture, more or less developed antennal club, crenulate or at least uneven pronotal sides, comparatively small oval pro- and mesocoxae, metacoxae usually rather widely separated, mostly three-segmented tarsi (except four-segmented tarsi in one subfamily recently described as new from Lebanese amber). Modern representatives of this family are completely mycetophagous and associated with spores and mycelium of different fungi (both lower and higher), particularly molds and other Ascomycetes, live in branches of trees, leaf-litter, fruitbodies of macrofungi and decaying substrates of plant origin. Recent species are distributed over the world, except for pre-polar areas. Usually this family is usually considered to consist of two subfamilies (Latridiinae Erichson, 1842 and Corticariinae Curtis, 1829). The earliest record of this group was known from Lower Cretaceous Burmese amber (Rasnitzin & Ross 2000). Then it was registered in Upper Cretaceous Taimyr amber from Yantardakh (Zerikhin 1977). Most members of this family (both Latridiinae and Corticariinae) were recorded from the Upper Eocene Baltic amber (Klebs 1910; Hieke & Pietrzeniuk 1984; Borowiec 1985; Kubisz 2000; etc.), although some species were also recovered from the Lower Oligocene of Florissant shales (Wickham 1913, 1914a, b) and Aix deposits (Heer 1856), the Lower Miocene of Rott (Schlechtendal 1894) and from the Pliocene of Durham (Lesne 1920). A separate subfamily was recently described as new also from Lebanese amber (Kirejtshuk & Azar 2008), which is different from both Latridiinae and Corticariinae in the extremely large eyes, sharp ridges on mesoventrite isolating the median depression for reception of the apex of long prosternal process, narrow 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 the sclerite from lateral ones, deep adsutural lines on elytra, very long and narrow four-segmented tarsi.

Subfamily Latridiinae Erichson, 1842

The specimen completely examined fits with the definition of the family because of the characteristic outlines of many body sclerites, including the shape of head, peculiar pronotum and elytral base, all coxae, 3-segmented tarsi and so on. The configuration of pronotum, very wide anterior part of frons, antennal insertions located closely to anterior edge of head, clear longitudinal ridges on elytra and comparatively long prosternal process support its attribution to the subfamily Corticariinae.



Figs 14-18: *Archelatrius marinae* gen. et sp.nov., holotype: (**14**) head, pronotum and elytral base, dorsal; (**15**) procoxae and prosternal process, ventral; (**16**) metaventrite and abdominal ventrite 1, ventral; (**17**) antenna; (**18**) mentum and labial palpi, ventral. Scales bars: A = 0.3 mm (Fig. 14); B = 0.18 mm (Figs 15-18).

Genus *Archelatrius* Kirejtshuk & Azar, gen.nov.

Type species: *Archelatrius marinae* sp.nov.

Etymology: The name of this new genus is formed from the Greek "arche" (beginning) and part of the generic name *Latridius*.

Diagnosis: The transverse pro- and metacoxae and four longitudinal ridges on elytra interspaced by double rows of coarse punctures distinguish this new genus from all the other members of the subfamily. This new genus is also characterized by a rather flattened body, very coarse puncturation of head and pronotum, 11-segmented antennae with three-segmented club and subquadrate pronotum.

Archelatrius marinae Kirejtshuk & Azar, sp.nov. (Figs 13, 14-18)

Holotype: "1453", sex unknown. The clear beetle, with missing distal half of elytra and most part of abdomen behind ventrite 1, is included in a small and quadrangular amber plate (length c. 2.0 mm, width c. 2.0 mm). This amber plate was embedded in Canada balsam between round glass slides.

Etymology: The epithet of this new species is devoted to the senior author's wife, Marina V. Kirejtshuk.

Description: Holotype. Length 0.75 mm, width 0.3 mm, height c. 0.1 mm. Elongate, moderately subflattened dorsally and ventrally; subunicoloured straw reddish; dorsum without a clear shine; underside somewhat shining; body with very sparse and extremely thin hairs (visible only through inverted compound microscope with high magnification).

Head with dense and fine punctures subequal to markedly smaller than eye facets, interspaces between them somewhat smaller than a puncture diameter, distinctly elevated into irregular ridges and densely microreticulated. Pronotum much larger punctures, forming a regular row along the anterior and posterior edges, and becoming diffuse between, interspaces between them elevated into a net of ridges, forming paralateral more or less regular ones. Elytra with four distinct longitudinal costae (three costae on plane elytra and one on slope to epipleura), with regular double rows of punctures (interspaced by ridges) between costae on plane and more or less confusing rows at sides. Prosternum along anterior edge with three transverse rows of punctures as those on pronotum. The rest part of pronotum and other ventral sclerites with punctures about as large as on pronotum and anterior part of prosternum, but much shallower (not very distinct) and interspaces between them subflattened (not elevated), finely and densely microreticulated to alutaceous.

Head slightly longer than wide, occiput and frons forming a subsquare plate isolated by anterior edge of frons anteriorly and lateral bridges; antennal insertions located at anterior edge of frons; eyes located at posterior edge, although between them and anterior edge of pronotum there is a temple looking like a tubercle projecting laterally; moderately small eye composed of large facets. Labrum transverse and large, with transverse to subarcuate anterior edge. Mentum comparatively large,

subtriangular to subpentagonal and almost twice as wide as long. Palpi rather small. Ultimate labial palpomere about as long as thick. Maxillary palpomere not clearly visible. Antennae 11-segmented, with flagellum submoniliform and 3-segmented loose antennal club, with sparse and very thin setae; almost twice as long as head wide at eyes; scape oval bulbous and somewhat longer than thick; antennomere 2 as shaped as scape, but somewhat smaller; antennomeres 3-8 subconical and thickened apically, about half as long as antennomere 2; antennomeres 9 and 10 cap-shaped and thickest in antennae; antennomere 11 missing. Pronotum subquadrangular, subparallel-sides, with crenulate lateral sides, in anterior half of each side there is a layer overhanging lateral edge; disk flattened and at sides almost vertically sloping to comparatively widely explanate lateral edges; posterior edge somewhat convex. Scutellum small, transversely triangular and with nearly distinct top. Elytra represented by only anterior part, somewhat wider than pronotum and apparently subparallel-sided.

Underside of head without antennal grooves and sutures. Prosternum slightly medially vaulted, its length before procoxae about 1/2 as long as metaventrite; process very narrow and somewhat projecting beyond posterior edge of prohypomeres. Procoxal cavities transversely oval and closed posteriorly. Trochantins apparently exposed in all coxae. Distance between coxae comparable in all pairs. Mesoventrite somewhat deepened in comparison with plane of prosternum and metaventrite. Mesocoxae suboval. Metaventrite slightly convex along the middle and without longitudinal suture or line, posterior edge between coxae angularly excised. Metepisterna moderately narrow and gradually widening anteriorly. Abdominal ventrite 1 about half as long as metaventrite. Epipleura of elytra at base about as wide as antennal club and gradually narrowing posteriorly.

Legs moderately narrow and very long. Trochanters slightly elongate. Tibiae very thin and slightly longer than femora, with some clear setae at apex and distinct spurs. Femora of usual configuration, thickest at the middle and about 2.5-3.0 times as wide as corresponding tibiae; metafemur with gently convex posterior edge. Tarsi about 2/3 as long as tibiae (metatarsus longer than pro- and mesotarsi), tarsomeres 1-2 narrowly lobed and short, tarsomeres 3 about as long as previous ones combined, claws short and thin.

Discussion

The species here described are the oldest representatives of the families Dermestidae and Monotomidae, and also of the subfamily Latridiinae. Recent Trinodinae (Dermestidae) feed on dead insects and are known to be scavengers in spider webs. The other two species here described belong to the mycetophilous groups in the Recent fauna, which are associated mostly with forests. A similar mode of life and habitat can be supposed for the respective fossil representatives. All these groups have rather wide Recent distributions.

Zusammenfassung

In dieser Arbeit werden mehrere Gruppen der artenreichsten Unterordnung der Käfer (Polyphaga) aus Libanesischem Bernstein (Unterkreide) beschrieben. Die neue Gattung und Art *Cretonodes antounazari* gen. et sp.nov. wird in den neuen Tribus Cretonodini trib.nov. gestellt, welcher somit der früheste Vertreter der Unterfamilie Trinodinae (Familie Dermestidae, Speckkäfer) ist. Für *Rhizophtoma elateroides* gen. et sp.nov. wird die neue Unterfamilie Rhizophtominae subfam.nov. eingeführt, welche das älteste Taxon der Monotomidae (Detrituskäfer) ist. *Archelatrius marinae* gen. et sp.nov. ist der früheste Vertreter der Unterfamilie Latridiinae (Familie Latridiidae, Moderkäfer). Die fossilen Belege der jeweiligen Familien werden außerdem zusammengefasst dargestellt.

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