New beetles of the suborder Polyphaga from the Lowermost Eocene French amber (Insecta: Coleoptera)

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Abstract. The paper deals with the descriptions of three new genera, one new subgenus and eleven new species of the superfamilies Scirtoidea, Cleroidea, and Cucujoidea (suborder Polyphaga) originated from the Lowermost Eocene amber, namely: the Scirtidae: *Cyphon gallicus* **nov. sp.** and *Cyphon lobanovi* **nov. sp**.; the Melyridae: Malachiinae *Colotes constantini* **nov. sp.** and *C. impexus* **nov. sp**.; the Nitidulidae: Cybocephalinae *Pastillocenicus polyaki* **nov. gen., nov. sp**., and *P. grandiclavis* **nov. gen., nov. sp**. and *P. longifrons* **nov. gen., nov. sp.**; the Kateretidae: *Hetherelus expressus* **nov. sp.** and *Eoceniretes yantaricus* **nov. gen., nov. sp.**; the Smicripidae: *Smicrips europeus* **nov. sp.**; and the Anthicidae: Eurygeniinae *Oisegenius antiquus* **nov. gen., nov. sp.** The systematic positions of these new taxa and hypotheses on their bionomy are discussed.

Résumé. **Nouveaux Polyphaga de l'ambre éocène basal français (Insecta : Coleoptera).** Trois nouveaux genres, un sous-genre et onze nouvelles espèces de Scirtoidea, Cleroidea et Cucujoidea (sous-ordre Polyphaga) sont décrits de l'ambre éocène basal de France. Il s'agit des Scirtidae : *Cyphon gallicus* **nov. sp.** et *Cyphon lobanovi* **nov. sp.** ; des Melyridae: Malachiinae : *Colotes constantini* **nov. sp.** et *C. impexus* **nov. sp.** ; des Nitidulidae : Cybocephalinae: *Pastillocenicus polyaki* **nov. gen., nov. sp.** et *P. grandiclavis* **nov. gen., nov. sp.** et *P. longifrons* **nov. gen., nov. sp.** ; des Kateretidae : *Hetherelus expressus* **nov. sp.** et *Eoceniretes yantaricus* **nov. gen., nov. sp.** ; du Smicripidae: *Smicrips europeus* **nov. sp.** ; et de l'Anthicidae : Eurygeniinae : *Oisegenius antiquus* **nov. gen., nov. sp.** Les positions systématiques de ces taxons nouveaux et des hypothèses sur leurs bionomies sont discutées.

Keywords: Scirtidae, Melyridae, Nitidulidae, Kateretidae, Smicripidae, Anthicidae, France.

France is known by many places, where amber of different age was deposited (Lacrois 1910; Schlüter 1978; etc.). Since 1996 a great number of amber inclusions has been obtained in the outcrop with the Lowermost Eocene sediments in the Oise Department. Recently these inclusions have been started to investigate by specialists on different groups of animals and plants (Nel *et al*. 2004). The crucial differences of this source from Baltic amber are connected with the age and taxonomic attribution of resin producing plant. The age depository of French amber in Oise falls on the end of the 'thermoera', while Baltic amber more or less coincides with the beginning 'crioera'. The infrared spectrum of the French amber is rather similar to that of the recent *Hymenaea* copal (Nel *et al*. 2004), while the resin for Baltic amber seemed to be produced by coniferous plants. These differences make possible to explain an essential distinction in composition of these amber entomofaunas. For now about 300 specimens were determined as beetles among 20 thousands inclusions deposited in MNHN. This is only a small portion of the inclusions prepared for study and yet examined. Among them there are recognized the following families: Cupedidae, Micromalthidae, Carabidae, Staphylinidae, Scydmaenidae, Pselaphidae, Catopidae, Scirtidae, Eucinetidae, Elateridae, Eucnemidae, Buprestidae, Dermestidae, Cleridae, Anobiidae, Malachiidae, Nitidulidae, Phalacridae, Cryptophagidae, Kateretidae, Smicripidae, Silvanidae, Coccinellidae, Endomychidae, Corylophidae, Latridiidae, Ciidae, Scraptiidae, Melandryidae, Mordellidae, Rhipiphoridae, Mycteridae, Anthicidae, Aderidae, Chrysomelidae, Apionidae, and Curculionidae. The representatives of Archostemata, Buprestidae and Rhipiphoridae have been described in separate papers (Batelka *et al*. 2006; Bílý & Kirejtshuk 2007; Kirejtshuk *et al*. in press a). Some further species are considered in this publication. Nevertheless, even the forms here described give some evidence of a complex origin of this fauna. Particularly some fossils show how many unexpected findings should be obtained in this staff of amber, viz. some Cybocephalinae (earliest record of the subfamily), parasitoids of coccids spread in recent conditions mostly in areas with warm sub-

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tropical climate, and a member of the genus *Smicrips* Leconte 1878 (Smicripidae) (first fossil record of the family), characteristic of recent fauna of Central and South America.

At the same time the characteristic of both Baltic and French amber is the comparative abundance of representatives of Aderidae, probably connected with certainty of the period of resin production in both 'Baltic' and 'French' forests. Probably this period in both cases coincided with time of most pest attack. In modern forests of the North Hemisphere this time is more or less stretched through the spring and early summer, although in some areas with more intertropical climate this family is one most abundantly represented in the Recent epoch (for example, islands of West Indies). The emergence of adults of Aderidae usually coincides with flowering of many angiosperms. Perhaps, frequency of 'stellate hairs' (of *Quercus* origin?) in Baltic amber supports this conclusion. However, Aderidae are well represented in the Lower Cretaceous Lebanese amber (Kirejtshuk & Azar in press). In contrast to the Baltic fauna, this representation of Aderidae in the 'French' forest is combined with a more important frequency of Corylophidae, while that in Baltic amber agrees with a great representation of Scirtidae, which are present by only few specimens in the French Eocene amber.

Spahr (1981) and Ponomarenko & Kirejtshuk (2008) published references to the coleopterous inclusions in amber of different origins.

Among other things some species of the subfamily Alticinae and other leaf beetles (Chrysomelidae) have been discovered in this French amber. This group is more characteristic of grass habitats than arboreal ones and it can be regarded as an indicator of grassland biotas, although some Alticinae and Eumolpinae from this French amber seemed to be associated with tree canopy. However, some genera found in the Baltic amber are not represented in the French amber. They belong, for example, to the Scirtidae and Nitidulidae, although seven specimens of *Cyphon* Paykull 1799 and *Scirtes* Illiger 1807 from the first family (three of them are here described), six specimens of Cybocephalinae from the second have been found among the sorted material (species of Cybocephalinae are here described).

Material and methods

The material under consideration is deposited in the Laboratoire de Paléontologie, Muséum national d'Histoire naturelle, Paris, although one paratype of *Colotes constantini* **nov. sp**. (PA 2764) and one paratype of *P. longifrons* **nov. gen., nov. sp.** (PA 2451) are deposited in the collection of the Zoological Institute of the Russian Academy of Sciences (St. Petersburg).

The type stratum is Lowermost Eocene, in amber, *circa* - 53 Myr, Sparnacian, and level MP7 of the mammal fauna of Dormaal. The type locality is Farm Le Quesnoy, Chevrière, region of Creil, Oise Department (north of France).

Systematic palaeontology

Infraorder Elateriformia Crowson 1960

Superfamily Scirtoidea Fleming 1821

Family Scirtidae Fleming 1821

(= Sinodryopitidae Hong 2002)

Specimens of this family are quite common in the Upper Eocene Baltic amber (Iablokoff-Khnzorian 1961; Klausnitzer 1976, 2004; Kubisz 2000) and recorded from the Eocene Fushun amber (Hong 2002), although it is known also from one limestone site of sedimentary deposits with many findings of this family at the boundary between the Oligocene and Eocene (Bembridge Marls: Kirejtshuk *et al*. in press b). Besides, many representatives of this family are present in the Upper Jurassic Karatau (still remaining undescribed in the collection of the Palaeontological Institute of the Russian Academy of Sciences, Moscow) and some other outcrops of different ages. Members of this family were found in the Lower Cretaceous Burmese amber (Grimaldi *et al*. 2002) and in the Lower Cretaceous Lebanese amber (Kirejtshuk & Azar in press). The genus *Miocyphon* Wickham, 1914 from the Florissant shales (Lower Oligocene) can be scarcely considered as related to Scirtidae (Kirejtshuk *et al*. in press b). In contrast to Scirtidae, according to the original description and drawings, its body is comparatively large (8 mm long), its prothoracic segment is not rather short, its head is not clearly declined, and its elytral apices are subtruncate. The position of Sinodryopidae is discussed in the latter publication.

All the recent Scirtidae, and especially *Cyphon*, with known bionomy need water for larval development, because their larvae filter algae and other small particles from liquid substrates. Adults are usually adhered to vegetation near water basins. Therefore, marsh beetles not infrequently use for such purpose water-filled tree holes, leaf bases, wet soil, rotten logs, and similar sources of water. Sometimes larvae of some recent species develop in groundwater as deep as 10 meters. Adults of some species can occur in many dry localities, including even arid places in deserts.

Genus *Cyphon* Paykull 1799

Type species. *Cistela pallida* Fabricius 1775 (by subsequent designation by Westwood 1838), recent.

The specimens here considered as new members of

the genus *Cyphon*, in contrast to other scirtid groups with oval and convex body, are characterized by the narrow metafemora, gently outlined anterior and lateral edges of pronotum, pronotal base only slightly narrower than elytral base and not modified antennae. This genus is very abundant in both recent fauna and fossil records. About 100 recent species spread throughout different zoogeographical regions; however, the most of them are recorded in the Northern Hemisphere. Iablokoff-Khnzoryan (1961) described three species of *Cyphon* from the Baltic amber. Klausnitzer (2004) described three other species from the Baltic amber with exposed apical part of the aedeagus, which have various structures of the lateral lobes of tegmen. Hong (2002) figured a fossil from the Fushun amber (China) without species epithet, which, however, is certainly a Scirtidae, but the latter scarcely belongs to the genus *Cyphon* at all because of its much strongly declined metacoxae. Recently some species of this genus were recovered from Bembridge Marls (boundary between Oligocene and Eocene: Kirejtshuk *et al*. in press b). Thus, one of the species described herein (*Cyphon gallicus* **nov. sp**.) is the oldest representative of the genus. Another new species (*C. lobanovi* **nov. sp**.) preliminarily put in this genus supports a rather ancient origin for the diversity of this family.

Cyphon gallicus nov. sp. (Figs 1–8; 70)

Material. Holotype PA 3404, undefined sex [in a narrow amber stick, the beetle with missing left metatibia and tarsus as well as missing terminal antennomeres, together with a small Nematocera in front of it and a surface mould of Nematocera dorsally and behind the beetle. The consistence of the amber substrate is not homogenous, with some layers of very soft substrate and, therefore, surface of the amber is not very regular. Small pieces of organic matter diffusely spread throughout the amber piece and some concentration of them is observed around mouthparts of the beetle].

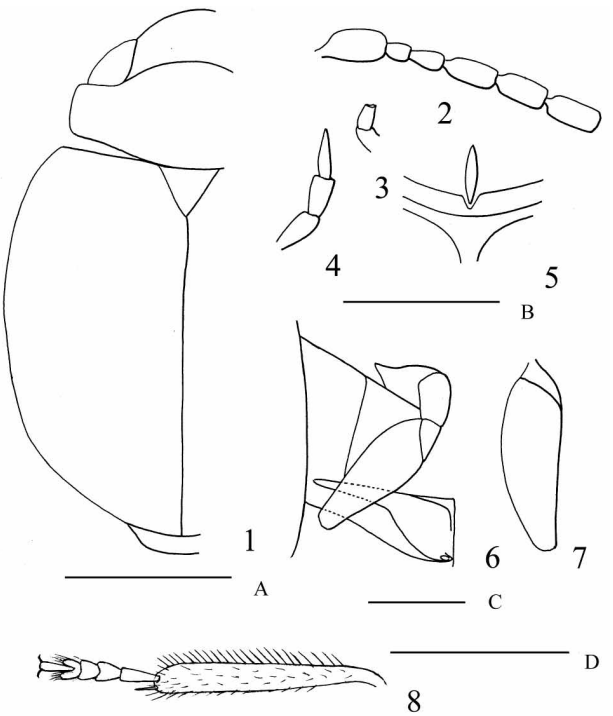
Paratype PA 3404, undefined sex [in a triangular amber bar, apparently the complete beetle visible only from above. The consistence of the amber substrate is rather heterogenous, with many layers of very soft substrate are below the beetle. Small pieces of organic matter, small gas bubbles and cracks diffusely spread throughout the amber piece with some concentration along the underside].

Note. The paratype and holotype of this new species are regarded as conspecific because they have the comparable proportion of visible dorsal sclerites, the same character of the dorsal puncturation and sculpture and, particularly, the character of the dorsal pubescence and similar antennae.

Etymology. Named after the Roman name Gallia of the country of amber origin.

Diagnosis. In contrast to the recent species of the genus as well as to *Cyphon lobanovi* **nov. sp.**, and, perhaps, the species described from Baltic amber (Iablokoff-Khnzoryan 1961; Klausnitzer 2004), this new species has the mesoventrite sharply divided into the sloping anterior part and posterior part, the latter being in the same plane as metaventrite and abdominal ventrites and somewhat elevated before the sloped part. Besides, this new species is characterized by comparatively rather wide elytra, very wide epipleura, and not expressed submesocoxal line. Other particular features are the nearly straight anterior edge of the pronotum, characteristic antennae, and comparatively widely separated procoxae. This genus is known also by fossils from the lacustrine deposits from Bembridge Marls of the Isle Wight (Kirejtshuk *et al*. in press b), which, in contrast to this new species, have a markedly more slender body and narrower head.

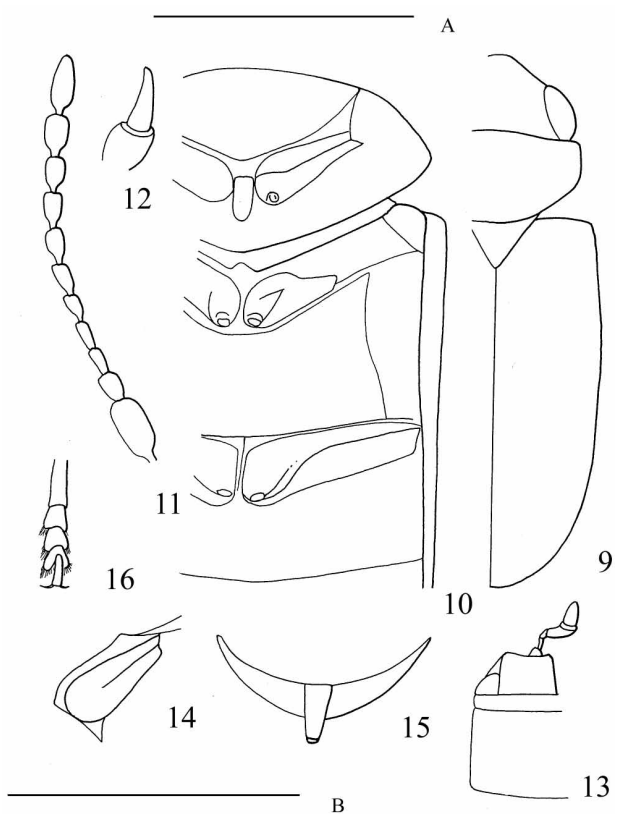
Description. Holotype: body 3.4 mm long, 2.0 mm wide, 1.5 mm high; oval, rather convex dorsally and ventrally; subunicolorous dark bronze with somewhat lighter appendages; with a strong bronze shine; dorsum with well conspicuous, suberect and comparatively long yellow greyish hairs about 2-3 times as long as distance between their insertions; underside somewhat sparser, very fine, subrecumbent and shorter hairs somewhat longer than distance between their insertions; elytral sides fringed with more conspicuous hairs.



Figures 1–8
Cyphon gallicus **nov. sp.** (Scirtidae): **1**, body, dorsally; **2**, proximal part of antenna, dorsally; **3**, maxillary palpus, ventrally; **4**, apex of labial palpus, ventrally; **5**, prosternal process and median part of mesoventrite, ventrally; **6**, meso- and metacoxae, metepisternum and mesofemur, ventrally; **7**, metafemur, ventrally; **8**, protibia and tarsus, dorsally. Scales: A, to fig. 1 representing bar of 1.0 mm; B, to figs 2-5 representing bar of 0.5 mm; C, to figs 6, 7 representing bar of 0.5; D, to fig. 8 representing bar of 0.5 mm.

Head and pronotum with distinct, sparse and small punctures, somewhat smaller than eye facets in diameter, interspaces between them about three puncture diameters and smoothly alutaceous; besides, pronotum with a irregular cellular net of lines over the puncturation and microsculpture. Elytra with much larger and denser punctures (somewhat larger than eye facets in diameter); interspaces between them about as large as a puncture diameter and smoothly alutaceous; besides, with an irregular cellular net of lines over the puncturation and microsculpture which is coarser than that on pronotum. Underside with punctures almost as large as eye facets; interspaces between them on thoracic sclerites and metacoxae subequal to or slightly greater than a puncture diameter and more or less smoothed; those on ventrites much less than a puncture diameter and with very dense, fine and pronounced microreticulation.

Head oval and well exposed dorsally, not clearly visible because of position of the beetle in amber, apparently somewhat longer than wide, considerably narrower than pronotum, with rather large eyes not reaching prothoracic segment, base somewhat convex and frons subflattened; labrum apparently quadrangular and transverse (about 1.5 as wide as long); mandibles invisible because of surrounding organic matter, apparently comparatively small; antennae with missing terminal segments (right one only with six antennomeres and left one with five), proximal six antennomeres combined about as long as pro- and mesotibiae, very shortly pubescent; scape moderately thick and subcylindrical, about twice as long as wide, about 2.5 times as long as oval antennomere 2 and nearly twice as long as subconical antennomere 3, antennomeres 4-6 subcylindrical and slightly shorter than scape; mentum not visible; ultimate maxillary palpomere subconical, rather narrowing apically, about 3.5 times as long as wide at its thickest place and about twice as long as ultimate labial palpomere; labial palpi three-segmented, ultimate labial palpomere only slightly narrowing apically and about twice as long as thick at base.



Figures 9–16
Cyphon lobanovi **nov. sp.** (Scirtidae): **9**, body, dorsally; **10**, thorax, ventrally; **11**, antenna, dorsally; **12**, apex of maxillary palpus, ventrally; **13**, mentum, ligula and labial palpus, ventrally; **14**, prosternal process with procoxa, laterally; **15**, abdominal apex, dorsally; **16**, metatarsus, dorsally. Scales: A, to fig. 9 representing bar of 1.0 mm; B, to figs. 10, 11, 14–16 representing bar of 0.5 mm.

Pronotum with distinctly bisinuate anterior edge (very convex in its middle) and rather convex posterior edge, all angles rounded, widest at posterior angles, slightly and gradually narrowing anteriorly, posterior and lateral edges not bordered; disk rather convex and sides rather sloping; scutellum moderately large and looking almost like equilateral triangle; prosternum moderately convex in anterior part and its process in narrowest place extremely narrow, far projecting together with coxae and strongly curved and somewhat widened before abrupt apex, looking like an isolated and widened plate; procoxae distinctly transverse and far projecting below; mesoventrite evenly sloping anteriorly from narrow transverse stripe before mesocoxae and somewhat elevating before the sloped part; mesocoxae transversely oblique, very narrowly but distinctly separated; metaventrite rather short and medially convex, with paracoxal line before metacoxae not interrupted in the middle and rather convex; submesocoxal line not expressed; metepisterna exposed along the whole length, rectilinearly widening anteriorly; ventrites comparable in length, although ventrite 1 slightly shorter, hypopygidium very widely rounded at posterior edge; epipleura very distinct, at base about four times as wide as distal plate of prosternal process and twice as wide as scape; pygidium very widely rounded to widely subtruncate at apex and slightly exposed from under elytral apices.

Elytra only slightly longer than wide combined, longest at suture, gently arcuate at sides; their apices apparently forming a joint arc, slightly convex to subflattened at disk and rather steeply sloping (but not subvertically) at sides, and sutural lines not clearly traced at distance from suture as great as antennomere 2 thick and expressed along the whole length.

Legs well developed and quite narrow; metacoxae contiguous and moderately oblique, with very distinct femoral plates at median part; trochanters rather of elongate type; tibiae slightly compressed, narrow, about as wide as flagellomeres, almost comparable in length (although posterior tibia somewhat longer) and subparallel-sided; their apices truncate and with one clear spur, outer edges with setiferous border; femora of usual shape, pro- and mesofemora about four times as wide as tibiae and metafemur somewhat wider. Tarsi five-segmented and comparatively short, tarsomere 1 subconical (on anterior and intermediate legs slightly longer, on posterior one apparently about twice longer than following ones), tarsomeres 2-4 widely bilobed, tarsomere 5 more or less subequal in length to pro- and mesotarsomere 1; claws simple narrow and short.

Variation. Paratype: Body 2.9, mm long, 1.7 mm wide; more slender than the holotype, rather convex dorsally and with abdominal apex more exposed from under the elytral apices; basal antennomeres looking like those of the holotype; the

antennomeres 7-10 more or less subcylindrical, about as large and as shaped as previous ones and antennomere 11 slightly longer and gently narrowing at subrounded apex.

Cyphon lobanovi nov. sp. (Figs 9–16, 71)

Material. Holotype PA 5605, probably male [beetle with missing left posterior leg included into an amber bar (about 8.0 mm long, 2.0 mm wide, and 2.0 mm high) containing many gas vesicles, some cracks along beetle body, and an elongate hole in amber on the right side from the beetle of the same size with remains of chitin, a mould of insect mummified together with the beetle].

Etymology. This species is named after A. L. Lobanov, colleague of the senior author and great enthusiast in creation of the web-site <http://www.zin.ru/Animalia/Coleoptera>.

Diagnosis. This new species that we tentatively attribute to the genus *Cyphon*, is distinct from the recent and Baltic amber species (Iablokoff-Khnzoryan 1961; Klausnitzer 2004) in the very sparse puncturation of the dorsum with rather smoothed interspaces and much reduced pubescence. Besides, this new species is rather slender in contrast to most members of the genus. Its parametacoxal line is nearly transverse before the anterior edge of coxae. See also above the diagnosis of the previous species. This species has the male genital structures quite different from those in the species described from Baltic amber. It is distinct from the species known from Bembridge Marls (Kirejtshuk *et al*. in press b) in the much more slender body and very long elytra.

Description. Body 2.1 mm long, 0.7 mm wide, 0.7 mm high; elongate oval, strongly convex dorsally and ventrally; subunicolorous dark bronze brown with lighter appendages; with a strong bronze shine; dorsum with extremely fine, moderately long, subrecumbent and scarcely visible hairs; underside yet finer hairs; elytral sides fringed with more conspicuous hairs.

Head and pronotum with distinct, dense and very small punctures, markedly smaller than eye facets in diameter, interspaces between them more or less greater than a puncture diameter and smoothly alutaceous; elytra with larger and sparser punctures (about as large as eye facets in diameter or somewhat larger); interspaces between them about as great as a puncture diameter and smoothly alutaceous to smoothly microreticulated; meso- and metaventrites as well as metacoxae with extremely small and sparse and very smoothed punctures; abdominal ventrites with shallow and almost distinct punctures, slightly smaller than eye facets, separated markedly less than a puncture diameter and with smoothed microreticulation.

Head oval and well exposed dorsally, apparently not longer than wide, scarcely narrower than pronotum, with rather large eyes not reaching prothoracic segment, base somewhat convex and frons subflattened; labrum invisible because of position of the beetle in amber, although its truncate anterior edge is visible between mandibular apices; mandibles well developed, rather thin, with simple and projecting apices and far extending beyond frons; antennae 11-segmented, comparatively long, reaching the anterior edge of metacoxae, very shortly pubescent and submoniliform, scape moderately thick and subcylindrical, about 1.5 times as long as wide, about twice as long as each of antennomeres 2 and 3 as well as somewhat longer than ultimate antennomere; antennomere 2 shortest and almost as thick as scape; antennomere 3 narrowest and slightly longer than antennomere 2; antennomeres 4-9 about as long as antenomere 2 and gradually becoming thicker and more moniliform; antennomeres 10 and 11 longest in flagellum and subcylindrical; ultimate antennomere forming a narrowly blunt apex; mentum subquadrangular, distinctly widened anteriorly; ultimate maxillary palpomere conical, rather narrowing apically, about 2.5 times as long as wide at its thickest part and about twice as long as ultimate labial palpomere; labial palpi three-segmented, ultimate labial palpomere narrowing apically and about twice as long as thick at base.

Pronotum with nearly straight anterior edge and rather convex posterior edge, all angles rounded, widest at posterior angles, very slightly and gradually narrowing anteriorly, posterior and lateral edges very distinctly bordered; disk rather convex and sides rather sloping; scutellum moderately large, slightly transverse and subtriangular; prosternum anteriorly looking like an extremely narrow stripe and its process in narrowest place markedly narrower than narrowest antennomere, far projecting together with coxae and vertically abrupt, as its apex looking like an isolated and somewhat widened plate; mesoventrite evenly sloping from posterior edge anteriorly; metaventrite rather short and medially convex, with straight parametacoxal line not interrupted in the middle; submesocoxal line reaching anterior angle of metaventrite and ending at inner anterior angle of metepisternum; metepisterna exposed along the whole length, arcuately widening anteriorly. Abdominal ventrites comparable in length, although distal ones slightly shorter, hypopygidium very widely rounded at posterior edge; epipleura very distinct and comparatively narrow, at base about twice wider than prosternal process and about as wide as scape.

Elytra about 1.5 time as long as wide combined, longest at suture, subparallel-sided in proximal 2/3, distally gently and arcuately narrowing; their apices forming a joint arc, moderately convex at disk and steeply sloping (subvertically) at sides, and sutural lines not expressed.

Pygidium and hypopygidium widely rounded at apex and slightly exposed from under elytral apices; besides, a moderately sclerotized and slightly narrowing anteriorly 'strut' protruding beyond the apices of these sclerites.

Legs well developed and quite narrow; procoxae distinctly transverse and far projecting below; mesocoxae transversely oblique, very narrowly but distinctly separated; metacoxae contiguous and rather oblique, with very distinct femoral plates at median part; trochanters rather of elongate type; tibiae slightly compressed, narrow, somewhat wider than flagellomeres, almost comparable in length and subparallel-sided; their apices truncate and with one clear spur, outer edges with setiferous border; femora of usual shape, pro- and mesofemora about three times as wide as tibiae and metafemur somewhat wider; tarsi five-segmented and comparatively short, tarsomere 1 subconical (on anterior and intermediate legs slightly longer, on posterior one about twice longer than following ones), tarsomeres 2-4 widely bilobed, tarsomere 5 more or less shoter than tarsomere 1; claws simple narrow and short.

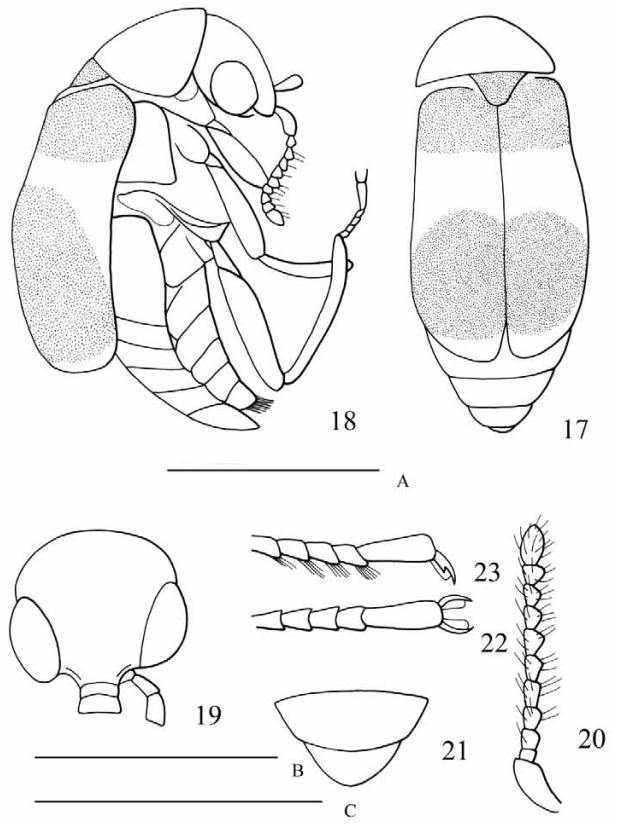
Note. The 'strut' protruding beyond the apices of the last abdominal segment shows some resemblance with the penis trunk of the recent *Cyphon furcillatus* Nyholm 1948.

Infraorder Cucujiformia Lameere 1938

Superfamily Cleroidea Latreille 1802

Family Melyridae Leach 1815

This family is scarce in fossils, although it is rather frequent in Baltic amber (Spahr 1981; Hieke & Pietrzeniuk 1984). It is also found in the Lower Oligocene Florissant (Wickham 1912, 1917 etc.) and the Oligocene French Massif Central (Théobald 1937). Recently this family was recovered from Bembridge Marls at the boundary between the Oligocene and Eocene (Kirejtshuk *et al*. in press b). Thus, our new species are the oldest described melyrids. Besides, this family was mentioned in the list of inclusions found in the Burmese amber deposited in the Natural History Museum in London (Rasnitzyn & Ross 2000), and one probable representative was determined in the Lebanese amber (Kirejtshuk & Azar in press). The recent range of this family includes all zoogeographical regions, although its maximum diversity corresponds to warm areas, particularly in the Old Mediterranean, including the Middle and Central Asia. Adults are phytophagous, live on vegetation and usually on flowers, although sometimes they can also feed on other insects. Larvae are primarily predaceous.



Figures 17–23
Colotes constantini **nov. sp.** (Melyridae): **17**, body, dorsally; **18**, idem, laterally; **19**, head, anterodorsally; **20**, antenna, dorsally, **21**, abdominal apex, ventrally; **22**, metatarsus, dorsally; **23**, idem, laterally. Scales: A, to fig. 17, 18 representing bar of 1.0 mm; B, to figs 19, 21 representing bar of 1.0 mm; C, to figs 20, 22, 23 representing bar of 1.0 mm.

Subfamily Malachiinae Fleming 1821

This subfamily is known in fossils mostly by some genera from the Upper Eocene Baltic amber: *Anthocomus* Erichson 1840; *Attalus* Erichson 1840; *Apalochrus* Erichson 1840; *Collops* Erichson 1840; *Colotes* Erichson 1840; *Ebaeus* Erichson 1840; *Malachius* Fabricius 1775; *Macrocerus* Motschulsky 1845 non Oken 1817 (= *Malchinus* auctorum non Kiesenwetter in Erichson 1863) (Berendt 1845; Motschulsky 1956; Klebs 1910; Iablokoff-Khnzorian 1960; Larsson 1978; Kubisz 2001 etc.). The genus *Malachius* is recorded from the Lower Oligocene Florissant Shales (Wickham 1916, 1917), and the genus *Troglops* Erichson 1840 is recorded from the Oligocene French Massif Central (Théobald 1937). Finally, a formal genus apparently similar to *Colotes* was recently established in the Bembridge Marls at the boundary between Oligocene and Eocene (Kirejtshuk *et al*. in press b).

Genus *Colotes* Erichson 1840

Type species. *Malachius maculatus* Laporte 1838, recent.

Remark. All specimens examined in the Oise amber are or look like females and seem to belong to one group of relatives, which is here tentatively put in *Colotes* because of many characters more or less similar, including the type of body coloration and integument sculpture. Recent species (about 100 species) are characterized by a sexual dimorphism in the maxillary palpi, but with a rather great variability of this structure in both sexes within the different subgroups of this genus. The antennae of the recent species are usually rather long and tend to be simple, although antennomere 2 can be as small as that in the fossil specimens here considered. The tarsi of the recent species are comparatively longer than those in the fossil specimens from the Oise amber. This genus was listed from Baltic amber (Klebs 1910; Larsson 1978 etc.), with one described species *Colotes sambicus* Kubisz, 2001.

On the other hand, the fossil specimens under consideration are rather similar to the recent species of the genus *Attalus* Erichson, 1840, subgenus *Abrinus* Mulsant, 1867, but the studied specimens differ from those of the latter subgenus in the more robust body with larger eyes, ultimate maxillary palpomere not

narrowed apically, more regularly oval head, clearly shorter antennae, and shorter tarsi. The recent fauna of *Attalus* includes at least 400 species divided into some subgenera, some of them have comparatively short antennae similar to that in the new fossil species and very short antennomere 2 (Wittmer 1988; etc.). Nevertheless the new fossil species differ from the recent species of this genus in the maxillary palpi with comparatively wide apex in the females, and in the very large eyes. They also differ in the rather small body size, comparatively short and subpectinate antennae. They could belong to a separate genus. But this problem of taxonomic separation should be solved after a futher study of male specimens from the Oise amber. Besides, our fossil species are clearly distinct from *Colotes sambicus* from the Baltic amber in the smaller body size, shorter antennae and tarsi, less developed puncturation, and alutaceous sculpture of dorsum.

The recent species of *Colotes* have a rather strong sexual dimorphism in the structure of their maxillary palpi. All fossil specimens here considered have no clear trace of such a dimorphism. Both type specimens of *C. impexus* **nov. sp**. are females (ovipositor). Only one paratype of *C. constantini* **nov. sp**. is clearly a female with a visible ovipositor, while the sex of other specimens is undetermined, but they all show a stable structure of the last maxillary palpomere. It can be also suggested that these Eocene fossils could still have the sexual dimorphism not so pronounced as in the recent *Colotes*.

Both series are here regarded as separate species because they show structures which are usually characteristic of species separation.

Colotes constantini nov. sp. (Figs 17–23, 72–74)

Material. Holotype PA 9530, female(?) [a complete beetle with partly exposed hind wings included into an amber bar containing many small cracks, pieces of organic matter and very small gas vesicles, two Nematocera, one Hymenoptera, and one Thysanoptera. The consistence of the amber substrate is not homogenous, with some layers after concentric rings].

Paratypes: PA 2764 3/6, female(?) [complete beetle, the consistence of the amber substrate is more or less homogenous, with two Dermestidae and one Hymenoptera]; PA 1781 10/15, female [complete beetle included into an elongate amber bar with irregular longitudinal planes partly unpolished, together with paratype of *Oisegenius antiquus* **nov. gen., nov. sp**. ('11/15'), one small Hymenoptera ('11/16'), paratype of *C. constantini* nov. sp., small gas vesicles and small pieces of organic matter; the consistence of the amber substrate is more or less homogenous]; 11959, female(?) [a complete beetle in a more or less homogenous large amber piece].

Etymology. This new species that we tentatively attribute to the genus *Colotes*, is named after R. Constantin, the friend of one of authors and specialist on family Melyridae, who contributed to the identification of this family in amber inclusions.

Diagnosis. This new species differs from *C. impexus* **nov. sp.** in the body coloration, particularly in the light transverse stripes on elytra, narrower prothoracic segment and head, shorter anterior part of frons, somewhat larger eyes, shape of ultimate maxillary palpomere, not so compressed flagellomeres, shape of pronotum, small eversible vesicles in both pro- and metathoraces, clearly oblique elytral apices, somewhat longer legs, finer and sparser puncturation on elytra, and bigger tooth of tarsal claw.

Description. Holotype: Body 2.4 mm long, with declined prothoracic segment and head 1.9 mm long, 0.7 mm wide, 0.6 mm high; elongate oval, moderately convex dorsally and ventrally, with an eversible vesicle at anterior pronotal angles moderately small and an eversible vesicle at distal angle of metathorax not extending along abdomen; head, metathorax, basal abdominal ventrites, base and distal parts of elytra (but not stripes along apices) and metatibiae rather dark to blackish, abdominal ventrites and median part of metafemora also dark (brownish); remainder lighter, almost straw reddish, including appendages of head, prothorac segment, transverse stripes through middle and apices of elytra and legs; with a some bronze shine; dorsum with well conspicuous, recumbent and short greyish hairs about two times as long as distance between their insertions; underside with sparse, very fine, subrecumbent and short hairs with distance between them less than length of hairs.

Head, pronotum and elytral base with rather small, sparse and shallow punctures, about 1/3 as large as eye facets in diameter; interspaces between them about three times as great as a puncture diameter and smoothly alutaceous; elytra apically becoming impunctured to unclearly covered with small and rather shallow punctures; underside and tergites uncovered by elytra with small and sparse unclear punctures, much smaller than eye facets in diameter; interspaces between them alutaceous to smoothly microreticulated.

Head oval and apparently not wider than long, slightly convex dorsally, somewhat narrower than pronotum, with rather large and oval eyes far not reaching prothoracic segment and about half as long as head; clypeus looking like a wide isolated stripe; labrum apparently quadrangular and transverse, about three times as wide as long; mandibles small and invisible because of milky foggy around anterior part of head; antennae subserrate and 11-segmented (both well preserved), scape rather large and somewhat curved; antennomere 2 very small and subcylindrical; antennomeres of flagella subtriangular and dorsoventrally compressed, about 2.5 as long as scape, although ultimate antennomere about half as long as scape; mentum invisible; penultimate maxillary palpomere narrow and twice as long as wide at pex; ultimate maxillary palpomere slightly widened apically and with obliquely truncate apex, rather widening apically, about twice as long as wide at its thickest place at apex and slightly longer than penultimate ones; labial palpi invisible.

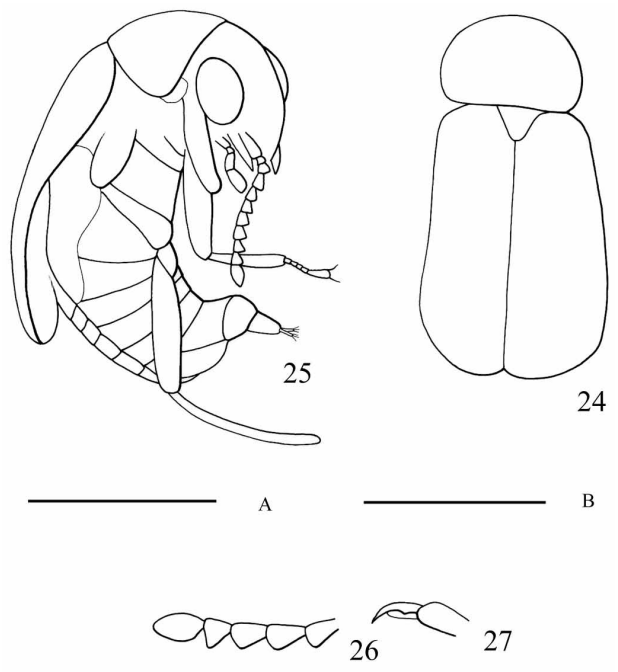
Pronotum suboval, with convex anterior and posterior edges and arcuate lateral edges, all angles not expressed, gradually narrowing anteriorly; disk rather convex and sides rather steeply sloping; scutellum rather large, looking almost like an elongate triangle and rounded at apex; prosternum not visible; mesoventrite invisible clearly; metaventrite rather long

and strongly convex in the middle, with paracoxal line before metacoxae; metepisterna exposed along the whole length and rather wide.

Elytra about 1 and 7/11 as long as wide combined, longest at suture and widest before apices, their sides subdivergent distally and apices suboblique, slightly convex to subflattened at disk and rather steeply sloping (subvertically) at sides and at base turning ventrally

Abdominal ventrite 1 longest; rest ventrites comparable in length; four distal abdominal tergites uncovered; distal abdominal segments gradually narrowing apically; hypopygidium very widely truncate to subemarginate at posterior edge; pygidium very widely rounded at apex.

Legs very long and very narrow; procoxae moderately projecting below; mesocoxae transversely oval, very narrowly separated; metacoxae apparently narrowly separated and strongly oblique; trochanters rather of elongate type; tibiae scarcely compressed, narrow, slightly wider than flagellomeres; pro- and mesotibiae about as long as antenna, almost comparable in length, nearly straight and subparallel-sided; metatibia nearly 1.5 times as long as antenna and somewhat curved and narrowing at apex; their apices truncate and without clear spurs, outer edges unbordered; femora of usual shape, pro- and mesofemora about three times as thick as tibiae and about as long as antenna; metafemur slightly wider and about 1 and 1/3 as long as antenna; tarsi five-segmented and comparatively short, tarsomere 1 subconical, tarsomeres 2-4 widely bilobed, tarsomere 5 more or less subequal in length to tarsomeres 1-3; claws long and toothed at the middle, simple, narrow and slightly curved, ungular appendages rather long and almost reaching the apex of claw.



Figures 24-27
Colotes impexus **nov. sp.** (Melyridae): **24**, body, dorsally; **25**, idem, laterally; **26**, apical antennomeres, dorsally, **27**, metatarsomere 5 with claws, laterally. Scales: A, to figs 24, 25 representing bar of 0.5 mm; B, to figs 25, 27 representing bar of 0.25 mm.

Variations. Paratype PA 2764: body 2.5 mm long, 0.7 mm wide, 0.6 mm high, with declined prothoracic segment and head 2.0 mm long; body elongate oval, moderately convex dorsally and ventrally, with an eversible vesicle at anterior pronotal angles moderately small and an eversible vesicle along metathorax and slightly extending along abdomen; light reddish to slightly brownish, although pterothorax, base and distal parts of elytra (but not stripes along apices) darkened (brown); with some bronze shining; dorsum with well conspicuous, not quite recumbent and short greyish hairs about two times as long as distance between their insertions; underside sparse, very fine, subrecumbent and short hairs with distance between them less than length of hairs. Abdomen with somewhat exposed ovipositor. Paratype PA 1781: body 2.3 mm long, 0.6 mm wide, with declined prothoracic segment and head 1.8 mm long; body straw reddish with somewhat darkened elytral base and distal parts of elytra; maxillary palpi of both paratypes identical to those of holotype. Paratype PA 2764: body 2.5 mm long, 0.7 mm wide, 0.6 mm high, with declined prothoracic segment and head 2.0 mm long; body elongate oval, moderately convex dorsally and ventrally, with an eversible vesicle at anterior pronotal angles moderately small and an eversible vesicle along metathorax and slightly extending along abdomen; light reddish to slightly brownish, although pterothorax, base and distal parts of elytra (but not stripes along apices) darkened (brown); with a some bronze shine; dorsum with well conspicuous, not quite recumbent and short greyish hairs about two times as long as distance between their insertions; underside sparse, very fine, subrecumbent and short hairs with distance between them less than length of hairs. Abdomen is with somewhat exposed ovipositor.

Colotes impexus nov. sp. (Figs 24–27, 75–77)

Material. Holotype PA 890, female [complete beetle obliquely passing through a crevice included into an amber bar, with many some small cracks, organic matter, and very small gas vesicles spread throughout of amber].

Paratype PA 9094, female [beetle lying closely to amber surface with left side of body opened].

Etymology. The epithet of this new species means 'coarse'.

Diagnosis. See the diagnosis of the previous new species.

Description. Holotype: body 2.2 mm long, 0.8 mm wide, 0.6 mm high, with declined prothoracic segment and head 1.6 mm long; body elongate oval, moderately convex dorsally and ventrally, with a very small eversible vesicle at anterior pronotal angles and a large one along distal half of metathorax and basal abdominal segments; metathorax, basal abdominal ventrites and elytra rather dark to blackish, abdominal ventrites and median part of metafemora also dark (brownish); remainder lighter, almost straw reddish; very slightly shining with a clear bronze luster on pronotum and head; body and appendages with well conspicuous, recumbent and short greyish hairs somewhat longer than distance between their insertions.

Head and pronotum with very small and shallow punctures, interspaces between them smoothly alutaceous; elytra with more or less distinct and shallow punctures about 1/2 as large as eye facets in diameter; interspaces between them a puncture diameter and smoothly alutaceous; integument of underside

apparently somewhat similar to that on head and pronotum, although at least on ventrites punctures somewhat larger and interspaces between them smoothly microreticulated rather than alutaceous.

Head oval and apparently not wider than long, slightly convex dorsally, somewhat wider than pronotum, with rather large and oval eyes far not reaching prothoracic segment and about 2/5 as long as head; clypeus as a wide isolated stripe; labrum not clearly visible, but apparently well exposed, transverse and somewhat convex anterior edge; mandibles rather long and projecting; antennae 11-segmented, scape moderately large and moderately curved; antennomere 2 rather short; flagellar antennomeres distinctly dorsoventrally compressed, somewhat less than 1/3 as long as scape, although ultimate antennomere nearly half as long as scape; mentum not visible; penultimate maxillary palpomere narrow and almost twice as long as wide at apex; ultimate maxillary palpomere slightly widened apically and with obliquely truncate apex, rather widening apically, slightly longer wide at its thickest place at apex and markedly shorter than penultimate ones; labial palpi not visible.

Pronotum suboval, with convex anterior and posterior edges and gently arcuate lateral edges, all angles not expressed, disk rather convex and sides rather steeply sloping; scutellum rather large, looking almost like a slightly elongate triangle and rounded at apex; prosternum and mesoventrite not visible; metaventrite rather long and strongly convex in the middle, with paracoxal line before metacoxae; metepisterna exposed along the whole length and rather wide.

Elytra about 1 and 5/11 as long as wide combined, apparently longest at suture and widest before apices, their sides subdivergent distally and apices suboblique to subtransverse, slightly convex to subflattened at disk and rather steeply sloping (subvertically) at sides and at base turning ventrally.

Abdominal ventrite 1 longest; ventrites 2-5 comparable in length, hypopygidium markedly shorter than ventrite 1 and much longer than ventrites 2-5, very widely rounded at posterior edge; remaining four distal tergites uncovered; distal abdominal segments gradually narrowing apically; pygidium somewhat projecting and comparatively narrowly subtruncate at apex.

Legs moderately long and very narrow; procoxae moderately projecting below; mesocoxae transversely oval, apparently very narrowly separated; metacoxae apparently narrowly separated and strongly oblique; trochanters rather of elongate type; tibiae slightly compressed, narrow, 3/4 as wide as flagellomeres; pro- and mesotibiae somewhat shorter than antenna, almost comparable in length, nearly straight and very slightly widened apically; metatibia somewhat longer than antenna and somewhat curved; their apices truncate and without clear spurs, outer edges unbordered; femora of usual shape, pro- and mesofemora about three times as thick as tibiae and markedly shorter than antenna; metafemur slightly wider and about as long as antenna; tarsi five-segmented and comparatively short, tarsomere 1 subconical, tarsomeres 2-4 widely bilobed, tarsomere 5 more or less subequal in length to tarsomeres 1-3; claws slightly toothed at base, narrow and slightly curved, ungular appendages rather long and almost reaching apex of claw.

Variation. Paratype: Body 2.0 mm long, 0.6 mm high, with declined prothoracic segment and head 1.5 mm long; body elongate oval, moderately convex dorsally and ventrally; subunicolorous straw reddish with slightly darker elytra.

Superfamily Cucujoidea Latreille 1802

Family Nitidulidae Latreille 1802

The sap beetles is a rather numerous and diverse family in the recent fauna, although only few fossils have been described. Recent Nitidulidae have rather diverse bionomies. They spread in many different environments, but this family is not present in water basins and in very wet substrates. It is also quite rare in arid areas. Sap beetles very seldom inhabit in soil. Most representatives are mycetophagous but many groups are associated with flowers. Few species are phyllophagous or predaceous. Some groups live on colonies of scale insects and whiteflies (Cychramptodini Kirejtshuk & Lawrence 1992 and Cybocephalinae). Highest diversity of sap beetles is recorded in forest communities. The Nitidulidae first appear in the fossil record from the Lower Cretaceous, with all earlier records erroneous (Kirejtshuk & Ponomarenko 1990). The carpophilin lineage of the family was recorded somewhat earlier (Baissa, Middle Neocomian) than the nitidulin lineages (Obeshtshayushtshiy Creek, Cenomanian). During the Cenozoic this family is mostly known from Baltic Amber (listed without description by Klebs 1910; Larsson 1978; Spahr 1981; Hieke & Pietrzeniuk 1984) and Dominican amber (Kirejtshuk & Poinar 2007), where all subfamilies of Nitidulidae have been found, except Amphicrossinae Kirejtshuk, 1986 and Cillaeinae Kirejtshuk & Audisio, 1986 (*in* Kirejtshuk 1986). The latter was recorded in the Lower Oligocene Florissant shales (Wickham 1913) together with other sap beetles from Carpophilinae Erichson 1842 and Nitidulinae. Besides, Nitidulinae are known from the Middle Miocene Wishnevaya Balka beds (North Caucasus, Karaganian: Kirejtshuk & Ponomarenko 1990), the Lower Oligocene Kleinkembs (Germany) (Théobald 1937), the Lower Miocene Radoboj (Croatia) (Heer 1847). The Cybocephalinae are recorded from the Baltic amber (Hieke and Pietrzeniuk 1984), and from the Middle Miocene Mojave Desert deposits (USA) (*Cybocephalus* cf. *californicus* Horn 1879) (Palmer *et al*. 1957). Thus, the species here described are the oldest fossil members of the subfamily Cybocephalinae.

Subfamily Cybocephalinae Jaquelin du Val 1858

Genus *Pastillocenicus* nov. gen.

Type species. *Pastillocenicus grandiclavis* **nov. sp.**, **other species**: *P. polyaki* **nov. sp.** and *P. longifrons* **nov. sp.**

Etymology. Named after the generic name '*Pastillodes*' and '*cenicus*', masculine gender.

Diagnosis. This genus differs from all other groups in Cybocephalinae in the combination of the comparably short

metaventrite, meso- and metacoxae more or less rather widely separated intermesocoxal line convex, and particularly lack of submetacoxal lines. The very important and characteristic features of this genus are the nearly four-segmented and very long antennal club (such long antennal club is unknown among the recent representatives of the subfamily), and also the protibia strongly widened along its inner edge. Finally, the eyes contour of *Pastillocenicus polyaki* **nov. gen., nov. sp**. is more or less even, only slightly interrupted by a fold of the frons along their anterior edge. However, the posterior part of the eyes of this new species is somewhat concealed into the prothoracic segment.

The lack of the submetacoxal lines and very long antennal club in the type species of this new genus are its most distinct characters, allowing distinguishing it among other representatives of the subfamily. The type species of this new taxon differs from members of *Cybocephalus* in the entire set of the characters mentioned above, although metacoxae of the latter are usually widely separated (but the distance between these coxae are usually markedly less than the width of the coxae). At the same time, the species of *Endroediellus* Endrödy-Younga 1962, in addition to general characters mentioned above, differ from *Pastillocenicus polyaki* in the very short and wide metafemora as well as in the shorter frons and labrum, not exposed from its ventral part. *Pastillocenicus polyaki* can be distinguished from *Hierronimus* Endrödy-Younga 1968 and *Pastillodes* Endrödy-Younga 1968 in the eyes occupying both dorsal and ventral head surface, not so short metaventrite, and much more widely separated metacoxae.

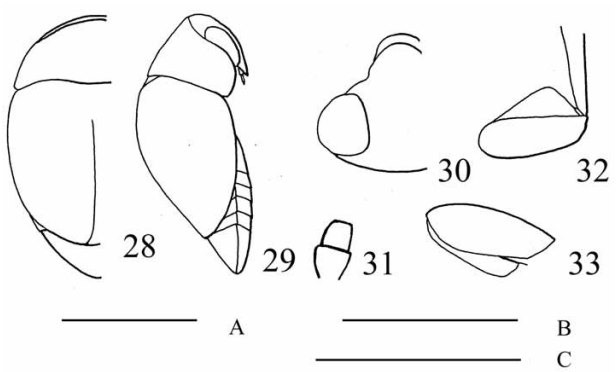
Species of the genus *Pastillus* Endrödy-Younga 1962, in contrast to *Pastillocenicus polyaki*, have a much shorter metaventrite and equally narrowly separated meso- and metacoxae (not widely separated at all). *Pastillocenicus polyaki* can be distinguished from species of *Pycnocephalus* Sharp 1891 in the smaller body size, eyes occupying both dorsal and ventral head surface, shorter metaventrite, much more widely separated metacoxae, narrow protibia without crenellation along outer edge, and longer and narrower metafemora and metatibae. *Pastillocenicus polyaki* can be distinguished from *Taxicephomerus* Kirejtshuk 1994 in the longer frons, shorter and transverse mentum, protibia without crenellation and projecting outer apical angle, lobed tarsomeres 1-3, and more widely separated metacoxae (in *Taxicephomerus* the tarsomeres are wider than in *Pastillocenicus polyaki* but scarcely lobed and with short setae, while its meso- and metacoxae are equally separated, but distance between coxae in each pairs much less than width of metacoxae). *Pastillocenicus polyaki* can be distinguished from *Horadion* Endrödy-Younga 1976 in the much longer and not transverse head, 11-segmented antennae with four-segmented antennal club, and much narrower protibia. The large eyes of *Pastillocenicus longifrons* **nov. sp.** share some resemblance with some species of the subgenus *Theticephalus* Kirejtshuk 1988, including species close to *C.* (*T.*) *decamerus* Endrödy-Younga 1968, but the subacute elytral apices of the new species from amber are rather different from those in species of *Theticephalus*, which are separately and widely rounded.

Note. All specimens examined show no sexual dimorphism in the structure of their abdomen, rather characteristic among species of the Recent and Baltic amber faunas. Males of this new fossil genus could have the anal sclerite not exposed from under apex of pygidium.

Description. Body rather small, oval, dorsally very convex and slightly convex ventrally; integument more or less smoothed and finely punctured; dorsum very finely and slightly conspicuously pubescent; underside with fine and dense hairs; posterior edge of pygidium and hypopygidium along posterior edge of penultimate ventrite with a regular row of more or less long and stout setae.

Head rather wide, subtriangular, dorsally weakly convex and with a very short and wide frons, rather large eyes more or less extended on underside, although along anterior edge of eye a narrow fold of continuing frons; labrum exposed from under frons, unilobed; mandibles with bidentate apices and more or less exposed from under frons; antennae 11-segmented and with three-segmented elongate and comparatively compact club; mentum subquadrangular and transverse; ultimate maxillary palpomere subcylindrical to slightly narrowing apically; ultimate labial palpomere comparatively wide and short; antennal grooves expressed; gular sutures subparallel-sided.

Pronotum large, subsemicircular and widest at base, rather and evenly convex, with steeply sloping sides, its anterior edge



Figures 28–33
Pastillocenicus longifrons **nov. gen., nov. sp.** (Nitidulidae): **28**, body, dorsally; **29**, body, laterally; **30**, head, anteroventrally; **31**, apex of antenna, dorsally; **32**, metacoxa and precoxal depression, ventrally; **33**, posterior leg, ventrally. Scales: A, to figs 28, 29 representing bar of 0.5 mm; B, to fig. 30 representing bar of 0.5 mm; C, figs 32, 33 representing bar of 0.5 mm.

slightly emarginated or excised; scutellum subtriangular and rather large; prosternum very short and with narrow process, curved along coxae and not extending the level of posterior edge of procoxae; distance between mesocoxae somewhat greater and that between metacoxae yet more greater than that between procoxae; mesoventrite excavate and medially subcarinate at bottom; metaventrite rather short and with posterior edge between coxae apparently shallowly emarginate; abdominal ventrite 1 longer than hypopygidium and each ventrites 2-4 shorter than both ventrite 1 and hypopygidium; epipleura moderately narrow and sloping downwards laterally.

Elytra somewhat shorter than their combined width, rather convex at disk, evenly and gently sloping laterally, with their sides more or less arcuate, longest at suture. Pygidium widely rounded at apex.

Tibiae rather widened along inner edge and apparently comparable in width at apex, wider antennal club; outer edge of meso- and metatibiae with a row of long setae; femora of usual shape and with gently convex anterior and posterior edges; metafemur wider and more enlarged apically; tarsi comparatively narrow, tarsomeres 1-3 narrowly lobed, claw moderately long and narrow.

Pastillocenicus longifrons nov. sp. (Figs 28–33, 78–79)

Material. Holotype PA 5132, female(?) [complete beetle with strongly deflected head and almost clear integument included in the small elongate amber piece].

Paratype PA 2451, female(?) [complete beetle with clear integument, somewhat deflected head (broken at frons) and slightly exposed posterior wing in the very small amber piece in Canada balsam on the microscope slide and covered by the round cover glass. The consistence of amber is more or less homogenous, the piece has a crack passing through the beetle and some pieces of organic matter and many very small gas bubbles.]. Paratype PA 2545, female(?) [complete beetle somewhat damaged at suture of in anterior half of left elytron, at both eyes and in the middle of metaventrite, and also with deflected head and integument partly with very thin milky bloom along body sides in the very small amber piece in Canada balsam on the microscope slide and covered by the standard cover glass. The consistence of amber is heterogenous, the boundaries of different layers passing in perpendicular directions along both body sides of the beetle and some heterogeny goes along body sides in the plane of the beetle].

Additional specimen PA 1032, female(?) [complete beetle with somewhat deflected head and integument finely covered with very thin milky bloom, although elytra and legs have nearly clear surface, in a small and elongate amber piece, with some very small vesicles spread through this piece and one depressed vesicle ventrally and behind from abdomen of the beetle. Apex of right wing is exposed from under elytral apex and declined on ventral body side].

Note. The specimen PA 1032 looks like more slender and more convex than other examined and recognized as conspecific (holotype and paratypes of *P longifrons* **nov. sp**.) and with some other differences (see below), but the characters that can be observed in it are mostly the same as in the females. Unfortunately, puncturation and sculpture of the integument of the male are unclear and cannot be used for comparison with the available females. Therefore this fossil is here regarded as an additional specimen, although futher specimens from this amber will probably clarify a distinctness of this specimen from those of the type series of *P. longifrons* **nov. sp**.

Etymology. Epithet formed from the Latin '*longus*' (long) and '*frons*' (frons, forehead).

Diagnosis. *Pastillocenicus longifrons* nov. sp. differs from the other species of the genus in the more slender and subovoid body with longer abdomen; more pubescent and not so shining dorsum; head with much longer frons and shorter labrum exposed from under frons; larger eyes; pronotum longer, more arcuate at sides and bi-emarginate but not concave at base; somewhat more distinct posterior angles of pronotum; longer elytra; less widely separated metacoxae; comparatively longer metacoxae, and somewhat narrower femora and tibiae.

Description. Holotype: Body 1.0 mm long (with deflected head), 0.5 mm wide, 0.3 mm high; elongate oval, dark chestnut brown to blackish with brown appendages; rather convex dorsally and slightly convex ventrally; dorsum with a slight shine and underside nearly mat; dorsum with rather sparse and well conspicuous hairs, about as long as distance between their insertions; underside with similar but denser hairs; a regular row of rather long and more stout setae along posterior edge of pygidium (about twice as long as those on the remainder of integument).

Head with some trace of weak, sparse and very fine irregular rugosity, nearly alutaceous, and without punctuation; pronotum with very sparse and small punctures bearing roots of hairs, interspaces between them apparently smooth or very finely alutaceous; elytra with punctures similar to those on pronotum, but in addition with some smaller punctures between them and interspaces finely alutaceous; pygidium with sparse and very small punctures, interspaces between them rather smoothed; underside seemingly finely and densely sculptured (not smoothed), ventrite 1 with milky cover on the median part; sides of metaventrite with smoothed and slightly depressed lateral area at each side before coxae allowing femur to move; this area distinctly bordered by a curved line, returning to anterior edge of coxa and composing about a third of total length of metaventrite.

Head weakly convex, with a frons rather projecting anteriorly, almost twice as long as distance between very large eyes (composed of moderately large facets); eyes seemingly extended on underside; labrum slightly exposed from under frons, unilobed and with a rather convex anterior edge; mandibles not exposed from under frons; antennae completely not visible, but the apex of their club can be seen from right side (apparently antennomere 10 slightly wider than antennomere 11, the latter somewhat longer than wide and transversely abrupt at apex).

Pronotum somewhat more than 2/5 as long as elytra, rather and evenly convex, with steeply sloping sides, its anterior edge bisinuate, lateral edges very slightly rounded, posterior edge with a shallow emargination at each side of scutellum, both anterior and posterior angles with somewhat rounded apices (but so widely as in the recent members of the genus); scutellum not visible dorsally due to a crack in the amber piece, but at least, as it is seen laterally, it has a moderate length;

distance between mesocoxae apparently somewhat greater and that between metacoxae markedly greater than that between procoxae (metacoxae apparently somewhat more widely separated that width of femora, but somewhat less than width of metacoxa); distance between metacoxae markedly smaller than width of metacoxa; metacoxa about 2.5 times as wide as long; metaventrite somewhat shorter than ventrite 1, its posterior edge between coxae apparently shallowly emarginate; ventrite 1 somewhat longer than hypopygidium and somewhat shorter than ventrites 2-4 combined; hypopygidium widely rounded to subtruncate at apex; epipleura moderately narrow and steeply sloping downwards laterally.

Elytra about 1.1 times as long as wide combined, rather convex at disk, evenly and gently sloping laterally, their sides slightly arcuate and apices nearly forming a joint arc, although at suture a shallow but distinct sutural angle expressed. Pygidium widely rounded at apex.

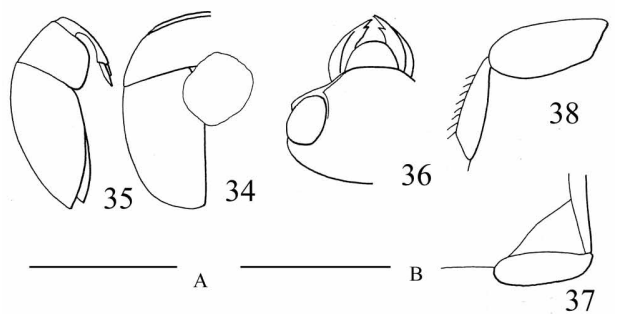
Legs well developed; tibia comparable in width at apex, which is slightly greater than that of antennal club (haetotaxy of all tibiae and outline of external edge of protibia invisible); femora about twice as wide as tibiae and about 1.5 times as wide as metacoxa long, with both anterior and posterior edges slightly convex; metafemur about three times as long as wide; tarsi of moderate length and rather narrow, tarsomeres 1-3 apparently narrowly lobed.

Variations. Paratype PA 2451: Body 0.9 mm long (with deflected head), 0.6 mm wide; very similar to the holotype, although the setae along the posterior edges of pygidium and hypopygidium are somewhat sparser and shorter as well as its metafemora are somewhat wider (about twice as wide as wide) in comparison with the holotype. Paratype PA 2545: Body 0.8 mm long (with deflected head), 0.6 mm wide; similar to other specimens of the type series, although the general shape of body looks like more narrowing posteriorly (more subovoid than oval); elytra somewhat shorter and abdomen more extending posteriorly; besides, its metafemora are as wide as in the paratype PA 2451.

Additional specimen PA 1032: Body 0.9 mm long (with deflected head), 0.5 mm wide, 0.3 mm high; elongate oval, dark brow to blackish with somewhat lighter appengages; strongly convex dorsally and suflattened ventrally; dorsum and underside apparently with a slight shine; dorsum with very sparse and very fine hairs; underside with fine and comparatively dense hairs; along posterior edge of pygidium, hypopygidium and previous ventrite as well as on anal sclerite there are somewhat longer and fine hairs, although sides of pygidium (but not their apices) and hypopygidium with sparse thicker setae (not so thick as those in the holotype and other paratypes).

Head and pronotum with some comparatively relief, dense and very fine irregular rugosity (alutaceous) and without distinct puncturation (may be because of milky bloom); elytra with very sparse and slightly visible punctures bearing root hairs, interspaces between them about as finely alutaceous as head and pronotum: pygidium without visible punctures, but with rather relief sculpture; underside seemingly finely and densely sculptured (not smoothed); sides of metaventrite with smoothed and slightly depressed lateral area at each side before coxa allowing femur to move; this area distinctly bordered by a curved line returning to anterior edge of coxa and composing about a third of total length of metaventrite.

Antennae 11-segmented and rather long (almost 4/5 as long as head wide), antennal club about 1/4 of total antennal club and with comparable length of antennomeres composing it; ultimate maxillary palpomere much narrower than subultimate, about four times as long as thick and slightly narrowing apically; scutellum very wide and widely rounded at apex, more than three times as wide as long; abdomen slightly extended beyond elytral apices; metacoxa about 3.5 times as wide as long; pygidium subtruncate at apex; hypopygidium subtruncate to shallowly emarginate at apex; short apex of anal sclerite slightly exposed; metafemur about twice as long as wide; metatibia with long hairs along its outer edge; tarsomeres 1-3 apparently narrowly lobed, tarsal claws moderately short and thin.



Figures 34–38
Pastillocenicus polyaki **nov. gen., nov. sp.** (Nitidulidae): **34**, body, dorsally; **35**, idem, laterally; **36**, head, anteroventrally; **37**, metacoxa and precoxal depression, ventrally; **38**, metafemur and tibia, ventral. Scales: A, to figs 34, 35 representing bar of 0.5 mm; B, to figs 36-38 representing bar of 0.25 mm.

Pastillocenicus polyaki nov. sp. (Figs 34–38, 81)

Material. Holotype PA 8980, female [almost complete beetle with strongly deflected head and clear integument included in a rather small amber piece. One crack transverse to body plane of the beetle is approached ventrally to its deflected head. Dorsum of the beetle is lying close to the amber surface, an irregular hole is opened at the place of its median basal part of pronotum, scutellum and median basal parts of elytra; besides, a milky gas vesicle is located at apex of mandibles and between all coxae].

Etymology. The epithet of this new species is devoted to Vladimir A. Polyak, friend of the senior author from the childhood, when we are spent a lot of time to in mountains and forests, observing life of wild animals, including insects.

Diagnosis. This new species differs from all congeners in the more oviform body with rather shining dorsum and particularly, in contrast to other new species, very shining head. Besides, its labrum seems to be longer than that in other species. This new species differs also from *Pastillocenicus grandiclavis* **nov. sp**. in the markedly shorter elytra, wider anterior edge of the shorter frons, which is far extended along anterior edge of eye as a rather thin fold, peculiarities of pubescence, puncturation and sculpture of integument, configuration of line isolating a smoothed place before metacoxae, metafemur less widened apically, pro- and mesofemora with more convex anterior and posterior edges, and subrectilinear inner edge of all tibiae. *P. polyaki* **nov. sp.** differs from *P. longifrons* **nov. sp.** in a shorter

abdomen; less developed pubescence; head with much shorter frons; smaller eyes; shorter pronotum, less arcuate at sides and concave at base; somewhat more distinct posterior angles of pronotum; shorter elytra; more widely separated metacoxae; and somewhat narrower femora and tibiae.

Description. Body 0.7 mm long (with deflected head), 0.6 mm wide, 0.3 mm high; oval, blackish with dark brown appendages; rather convex dorsally and slightly convex ventrally; dorsum rather shining with a bronze lustre and underside with a slight shine; dorsum nearly glabrous, although in distal half of elytra with very sparse and rather reddish hairs, about 2/3 as long as distance between their insertions and in apical part of head very small and slightly visible hairs; underside with fine and dense hairs; along posterior edge of pygidium and hypopygidium along posterior edge of penultimate ventrite there is a regular row of rather long and stout hairs (about twice longer than those on elytra).

Head with some trace of weak, sparse and very fine irregular transverse rugosity (nearly alutaceous) and with extremely small and very sparse punctures between eyes; pronotum completely smooth and with extremely small punctures; elytra with similar punctures, which in the distal half having a hair, interspaces between them finely and smoothly alutaceous; pygidium not visible; underside seemingly finely and densely sculptured (not smoothed); sides of metaventrite with smoothed and slightly depressed lateral area at each side before coxa allowing femur to move, isolated by curved line turning to anterior edge of coxae and nearly as long as half of total length of metaventrite.

Head weakly convex and with a very short and wide frons, not more as long as distance between very large eyes (composed of moderately large facets); eyes seemingly extended on underside, although along anterior edge of eye a long and narrow fold continuing frons disposed, which is nearly meeting with anterior angle of pronotum; labrum far exposed from under frons (about as long as frons before eyes), unilobed and with a rather convex anterior edge; mandibles moderately long, with bidentate apices and far exposed from under frons; antennae invisible.

Pronotum almost 1/3 as long as elytra, rather and evenly convex, with steeply sloping sides, its anterior edge bisinuate, lateral edges subrectilinear, posterior edge regularly emarginate, both anterior and posterior angles with somewhat rounded apices; scutellum mostly missing, only left part of base visible; distance between mesocoxae apparently much greater and that between metacoxae yet more greater than that between procoxae (that between metacoxae apparently twice as great as femur wide); metaventrite somewhat shorter than ventrite 1, its posterior edge between coxae apparently shallowly emarginate; metacoxae about 3.5 times as wide as long and distance between them about as great as width of metacoxae; ventrite 1 about as long as hypopygidium and somewhat longer than ventrites 2-4 combined; submetacoxal line not expressed; hypopygidium widely rounded at apex; epipleura moderately narrow and steeply sloping downwards laterally.

Elytra about 5/6 as long as wide combined, rather convex at disk, evenly and gently sloping laterally, their sides slightly arcuate and apices nearly forming a joint arc, although at suture a shallow but distinct sutural angle expressed; pygidium widely rounded at apex.

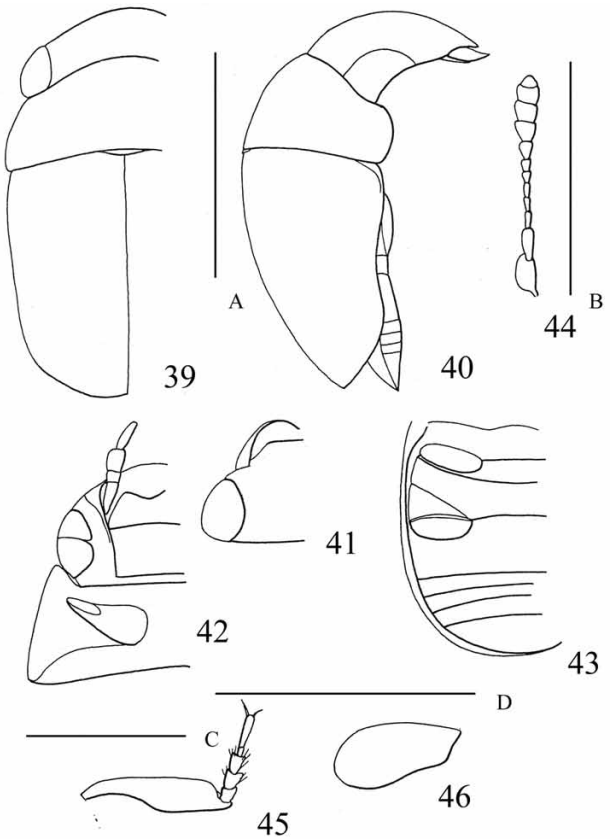
Legs well developed; tibiae apparently comparable in width at apex, somewhat less than a half as wide as femora (chaetotaxy and outline of external edge of protibia invisible, but metatibia subtrapezium-shaped and with long hair along its outer edge); femora more than twice as wide as tibiae, with both anterior and posterior edges slightly convex; metafemur about twice as long as wide; tarsi of moderate length and rather narrow, metatarsomeres 1-3 narrowly lobed, claw moderately long and narrow.

Pastillocenicus grandiclavis nov. sp. (Figs 39–46, 80)

Material. Holotype PA 602, female [complete beetle with not deflected head and almost clear integument included in a subquadrangular amber piece].

Etymology. Named after the Latin '*grandis*' (large, big, great) and '*clavus*' (nail, peg, club).

Diagnosis. This new species seems to be more subquadrate than other congeners with wider head and nearly rectilinear elytral sides. Its head is characterized by the rather coarce sculpture, but not expressed puncturation. See also the diagnoses of two



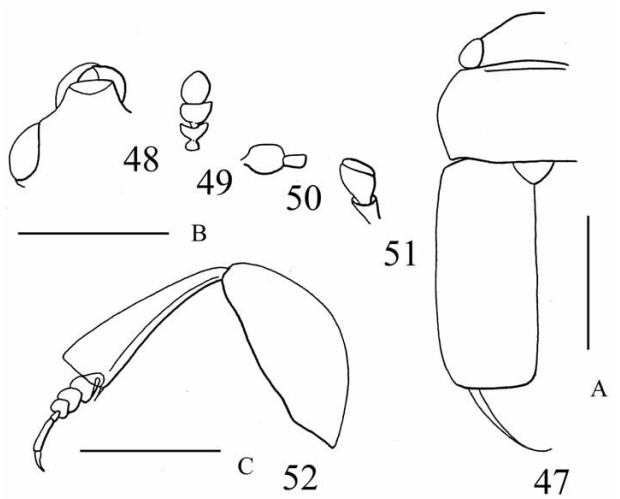
Figures 39–46
Pastillocenicus grandiclavis **nov. gen., nov. sp.** (Nitidulidae): **39**, body, dorsally; **40**, body, laterally; **41**, head, anterodorsally; **42**, head and prosternum, ventrally; **43**, pterothorax and abdomen, ventrally; **44**, antenna, dorsally; **45**, protibia and tarsus, dorsally; **46**, metafemur, ventral. Scales: A, to figs 39-41, 43 representing bar of 0.5 mm; B, to fig. 44 representing bar of 0.25 mm; C, to fig. 42 representing bar of 0.5 mm; D, to figs 45, 46 representing bar of 0.5 mm.

other new species of the genus.

Description. Body 0.9 mm long (with not deflected head), 0.7 mm wide, 0.4 mm high; oval, blackish with dark brown appendages; rather convex dorsally and slightly to moderately convex ventrally; dorsum rather shining (but without bronze luster) and underside with a slight shine; dorsum with very sparse and slightly conspicuous hairs (uniformly spread throughout dorsal sclerites), 1/2-3/5 as long as distance between their insertions; underside with fine, denser and more conspicuous hairs becoming to posterior edges of pygidium and hypopygidium as well as posterior edge of penultimate ventrite longer and markedly more conspicuous (up to twice longer than those on dorsum).

Head with very fine lines of somewhat transverse cellularity, and with very small and very sparse punctures; pronotum completely smooth and with extremely small punctures; elytra with similar punctures, interspaced even smaller punctures and smoothly alutaceous; pygidium invisible; underside very finely and very sparsely punctured, finely and densely sculptured (not smoothed); sides of metaventrite with smoothed and slightly depressed lateral area at each side before coxa allowing femur to move, isolated by rectilinear line nearly as long as half of total length of metaventrite.

Head weakly convex, with a moderately short and not wide frons, distinctly shorter than distance between very large eyes (composed of moderately large facets); eyes extended on underside in posterior part (where they looking like a triangle), along anterior edge of eye a rather short and narrow fold continuing frons disposed; labrum far exposed from under frons (markedly shorter than length of frons before eyes), unilobed and with a rather convex anterior edge; mandibles moderately long and moderately exposed from under frons; antennae 11-segmented and somewhat more than 2/3 as long as head wide, their three-segmented and elongate club consisting of about 2/7 of total antennal length and antennomere 8 enlarged apically and looking like involved in the club; scape and antennomere 2 subequal in length and together nearly as long as club, antennomeres 3-5 about 1/2 as long as preceding ones and subconical, antennomeres 6 and 7 shortest and oval, antennomeres of club subequal in width and ultimate somewhat longer than preceding one; mentum subquadrangular, about twice wider than long and emarginate anterior edge; penultumate maxillary palpomere more than twice thicker than following one; ultimate maxillary palpomere subcylindrical to slightly narrowing apically and about five times as long as thick; ultimate labial palpomere rather wide and slightly narrowing apically; antennal grooves well expressed up to the level of posterior edge of mentum; gular sutures subparallel-sided.



Figures 47–52
?*Heterhelus expressus* **nov. sp.** (Kateretidae): **47**, body with outline dark spot on each elytron, dorsally; **48**, head, anterodorsally; **49**, antennal club, dorsally; **50**, scape and antennomere 2, dorsally; **51**, labial palpus, ventrally; **52**, metafenur and tibia, dorsally. Scales: A, to fig. 47 representing bar of 1.0 mm; B, to fig. 48 representing bar of 1.0 mm; C, to fig. 52 representing bar of 0.5 mm.

Pronotum almost 1/3 as long as elytra, rather and evenly convex, with steeply sloping sides, its anterior edge very slightly bisinuate, lateral edges slightly arcuate, posterior edge regularly emarginate, both anterior and posterior angles with somewhat rounded apices; scutellum very transverse, subtriangular and about six times as wide as long; prosternum with process about as long as mentum and subparallel-sided, strongly curved along coxae and not extending to level of posterior edge of procoxae; distance between mesocoxae apparently much greater and that between metacoxae yet more greater than that between procoxae (that between metacoxae apparently twice as great as femora wide); distance between metacoxae bout as great as width of metacoxa; mesoventrite strongly excavate and medially subcarinate at bottom; metaventrite about as long as ventrite 1, its posterior edge between coxae apparently shallowly emarginate; metacoxae about three times as wide as long and distance between them about as great as width of metacoxae; ventrite 1 slightly longer than hypopygidium and somewhat longer than ventrites 2-4 combined; submetacoxal line not expressed; hypopygidium widely rounded at apex; epipleura moderately narrow and steeply sloping downwards laterally.

Elytra very slightly longer than wide combined, rather convex at disk, evenly and gently sloping laterally, their sides slightly arcuate and apices nearly forming a joint arc, although at suture a shallow but distinct sutural angle expressed; pygidium widely rounded at apex.

Legs well developed; tibiae rather widened along inner edge and apparently comparable in width at apex, about 1.5 times as wide as antennal club and nearly nearly twice as wide as pro- and mesofemora; outer edge of meso- and metatibiae with a row of long setae; pro- and mesofemora about twice as wide as tibiae, with both anterior and posterior edges very slightly convex; metafemur wider (about 2.5 times as long as wide) and more enlarged apically; tarsi of moderate length and rather narrow, tarsomeres 1-3 narrowly lobed (particularly in intermediate and posterior legs), claw moderately long and narrow.

Family Kateretidae Erichson 1843

This family is known from fossils only after the description of *Amartus petrefactus* Wickham 1912 from the Lower Oligocene Florissant shales and one new genus from the Lebanese amber (Kirejtshuk & Azar 2008), although undescribed genera and species are present in Baltic amber as well. The recent members of this group are associated with angiosperm

flowers. The specimens here described as new members of this family are usually quite distinct from the sap beetles (Nitidulidae) by the elongate, not strongly dorsoventraly compressed and looser antennal clubs, however, all Cybocephalinae have also elongate club, but compact and strongly dorsoventraly compressed.

Genus *Hetherelus* Jacquelin du Val 1858

Type species. *Cercus sambuci* Erichson 1843 [= *Heterhelus scutellaris* (Heer 1841)], recent.

Remark. This genus was never recorded from fossils before this study. Its recent species are associated with inflorescences of *Sambucus* (Caprifoliaceae). This new species looks rather different from the recent species (see diagnosis below), however its separation into a different genus or subgenus cannot be proposed at this stage.

Hetherelus expressus nov. sp. (Figs 47–52, 82)

Material. Holotype PA 1937, undefined sex [incomplete beetle with one Diptera: Ceratopogonidae, legs of a large insect].

Etymology. The epithet of this new species means 'expressive'.

Diagnosis. This fossil belongs to Kateretidae because of the quite characteristic shape of all sclerites, in particular the transverse procoxal cavities, antennal club and legs. Its shape of pronotum, elytra and antennal clubs show that this species should be regarded as a member of the Palaearctic *Heterhelus* Jacque du Val 1858, although its body is outlined as in *Sibirhelus corpulentus* (Reitter 1900). In contrast to the East Palaearctic *Sibirhelus corpulentus*, *Heterhelus expressus* **nov. sp.**, like other species of *Heterhelus*, has not a strongly convex pronotum, its disk being slightly convex, although its sides at lateral edges are quite steeply sloping, a quite distinct antennal club, and much sparser and finer dorsal puncturation. The tarsal claws of the new species are somewhat bulbous, but not toothed, as those in *Sibirhelus* Kirejtshuk 1984. Nevertheless, this new species is very distinct from the recent *Heterhelus* in the general outline of its body, as that in *Sibirhelus*, and quite distinct basal border of pronotum. Besides, this new species has a ratio between prosternum and metaventrite, basal border of pronotum, and distance between metacoxae, all characteristic of *Heterhelus*.

It is impossible to define the sex of the holotype of this new species, because the ultimate abdominal segment in this genus has no clear sexual dimorphism. However, its very narrow anterior tarsi make possible to suppose that the holotype could be a female rather than a male.

Description. Body 3.6 mm long, 1.5 mm wide, 1.2 mm high; moderately convex ventrally and dorsally; subunicolorous reddish brown with a round dark spot at inner apical angle of each elytron; dorsum with rather fine hairs, about as long as distance between their insertions (hairs on pygidium more conspicuous).

Head with distinct punctures, markedly smaller than eye facets in diameter, intersparces between them about as great as a puncture diameter and somewhat alutaceous; pronotum and pygidium with punctures similar to those on head, but somewhat smaller and sparser and interspaces between them alutaceous; elytra with markedly smaller and sparser punctures, interspaces between them 2-3 puncture diameters; puncturation and sculpture of underside invisible because of milky condition of amber.

Head somewhat shorter than distance between eyes (consisting of rather large facets), subflattened, its anterior edge distinctly emarginate and acute tops of lateral angles; labrum unlobed and moderately exposed from under frons; mandibles well developed and moderately projecting anteriorly; antennae somewhat shorter that head wide, scape moderate large, antennomere 2 about 3/4 times as long as scape and more or less longer than the rest antennomeres of flagellum, club composing of about 2/7 of total antennal length with ultimate segment largest and subacute at apex; mentum apparently of usual shape and about 2.5 times as wide as long; last maxillary palpomere narrow and rather long; last labial palpomere strongly widened apically and obliquely truncate at apex.

Pronotum transverse, slightly convex at disc and rather steeply sloping at lateral edges, distinctly bordered along sides and base as well as with widely rounded all angles, its anterior edge somewhat convex, sides regularly arcuate and posterior edge almost straight, but with a shallow sinuation at each posterior angle; scutellum subsemicircular; prosternum moderately short with a quite narrow process; metaventrite about twice as long as prosternum; outlines of ventrites not visible.

Elytra somewhat wider than pronotum, gently convex at disk and rather steeply sloping at sides, slightly longer than wide combined, with subparallel sides, their apices transversely truncate; pygidium nearly completely exposed from under elytral apices, with very widely rounded to truncate apex.

Right anterior and median legs complete and well developed; pro- and mesofemora as well as pro- and mesotibiae compared shape; tibiae about twice as wide as antennal club and femora nearly twice wider than tibiae; protibia apparently with bordered outer edge; protarsus about 1/3 as wide as tibiae; tarsal claws rather long and slightly bulbous at base.

Genus *Eoceniretes* nov. gen.

Type species. *Eoceniretes yantaricus* **nov. gen., nov. sp**.

Etymology. Named after Eocene and '*retes*', usual suffix for generic names in the family Kateretidae; masculine gender.

Diagnosis. Most characters of this fossil are similar to those in the recent species of *Brachypterus* Kugelan, 1794, which range in the North Hemisphere, mostly in the Holarctic regions. But the shape of penultimate abdominal segment resembles that of species of *Brachypterolus* Grouvelle, 1912. For both genera the strongly toothed tarsal claws are characteristic, although development of the tooth within *Brachypterus* is rather variable. At the same time the unique shape of scutellum of the new species makes possible to erect for it a new genus. From these mentioned recent genera *Eoceniretes yantaricus* **nov. gen., nov. sp**. differs also in the not strongly convex body, comparatively shorter elytra, remaining completely uncovered three last abdominal segments, and narrowly explanate pronotal sides. The new genus shows some similarity with the member of the family recently described from the Lower Cretaceous Lebanese amber (Kirejtshuk & Azar 2008), although it differs from the latter in the larger and not so narrow body, antennal club not subparallel-sided and with subacute apex, wider mentum

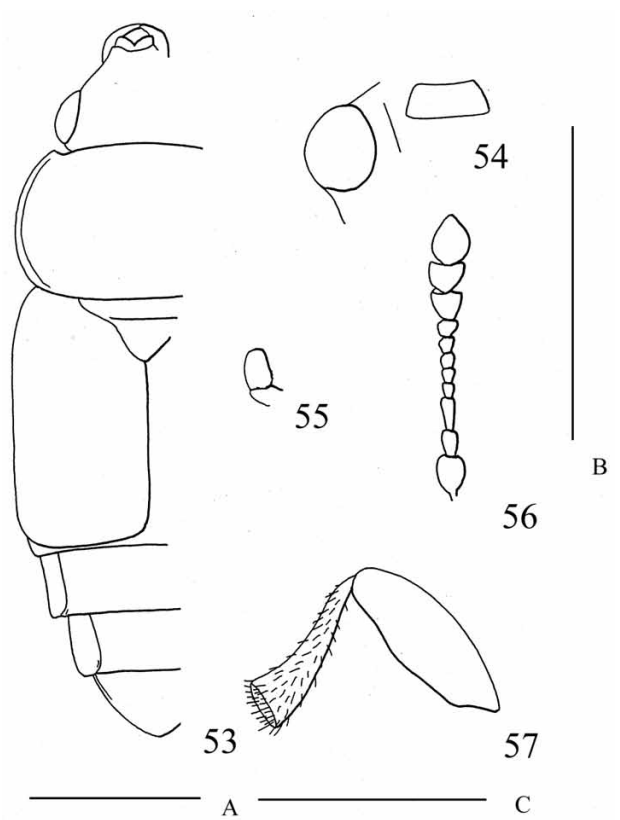
with subquadrangular shape, arcuate outline of eye edge on underside, almost regularly oval pronotum with distinctly bordered and narrowly explanate sides, characteristic scutellum, much shorter elytra, ends of the two penultimate abdominal segments markedly wider than base of following segments, widely separated metacoxae, and strongly toothed tarsal claws. The outstanding feature of this genus is also the absence of visible tibial spur.

Eoceniretes yantaricus nov. sp. (Figs 53–57, 83–84)

Material. Holotype PA 9167, undefined sex [complete beetle with strong milky cover around its abdomen included in an elongate amber piece].

Etymology. The epithet of the new species is formed from Slavic adjective with meaning amber.

Description. Body 2.2 mm long (with rectified abdomen apparently 2.5 mm long), 0.9 mm wide, 0.5 mm high; body elongate oval, moderately convex dorsally and ventrally; dark brown with lighter appendages (nearly reddish); dorsum with very conspicuous silvery grey hairs, somewhat longer than distance between their insertions; underside with similar pubescence, but not so conspicuous.



Figures 53–57
Eoceniretes yantaricus **nov. gen., nov. sp.** (Kateretidae): **53**, body with rectified abdomen, dorsally; **54**, mentum and eyes, ventrally; **55**, apex of labial palpus, ventrally; **56**, antenna, dorsally; **57**, metafemur and metatibia, ventral. Scales: A, to fig. 52 representing bar of 0.5 mm; B, to figs 54, 56 representing bar of 0.5 mm; C, to fig. 57 representing bar of 0.5 mm.

Head and pronotum with rather deep punctures, about as large as eye facets in diameter, interspaces between them slightly narrower than a puncture diameter and without clear microreticulation; elytra with similar, but partly elongate punctures, interspaces between them markedly narrower than those on head and pronotum; prosternum with pucturation becoming microtuberculation and rather coarse microsculpture; metaventrite and ventrites 1-3 with punctures almost as large as those on head and pronotum, but much shallower and interspaces between them with rather contrasting microreticulation.

Head about as long as distance between eyes (consisting of rather large facets), subflattened, anterior edge of frons shallowly emarginate and with narrowly rounded lateral angles; labrum well exposed from under frons; mandibles moderately developed and well exposed from dorsally; antennae somewhat shorter than head broad; oval scape somewhat longer than subcylindrical antennomere 2, subconical antennomere 3 rather narrow and nearly as long as scape; antennomeres 4-7 suboval, comparable in shape and size, less than half as long as antennomere 4; antennomere 8 similar to previous, but slightly larger; club somewhat wider than scape and composing much less than 1/3 of total antennal length, antennomeres 9 and 10 comparable in shape and size and each of them somewhat shorter than antennomere 11 (the latter subacute at apex); eyes on underside somewhat enlarging and somewhat wider than dorsal side, with arcuate outline, minimal distance between them almost twice greater than width of mentum; mentum covered by milky cover and apparently of usual shape, i.e. subquadrangular and not wider than length of antennal club, its emarginate anterior edge disposed much anteriorly than the level of anterior edge if eyes; ultimate labial palpomere suboval, somewhat narrowed apically and almost twice longer than wide; antennal grooves very slightly impressed.

Pronotum transversely oval, moderately and evenly convex and with rather rounded all angles; its sides arcuate and narrowly explanate, anterior and poisterior edges weakly convex; scutellum subtriangular and with rather broader base, as a result of this with very peculiar outline; prosternum gently convex with a narrow process subparallel-sided, somewhat narrower than antennal club and narrowly rounded at apex; distance between mesocoxae markedly narrower and that between metacoxae almost four times as great as that between procoxae; mesoventrite very short. Metaventrite about 1 and 1/4 as long as prosternum and medially nearly subflattened, its posterior edge between coxae nearly straight; ventrites 1-3 considerably shorter than ventrite 4 and hypopygidium, ventrite 4 at apex much wider than base hypopygidium and the latter somewhat longer than penultimate ventrite and widely rounded at apex; two penultimate tergites completely and apex of previous tergite remaining uncovered by elytra, laterosternites comparatively wide.

Elytra nearly as long as wide combined, subparallel-sided, moderately convex at disk and steeply sloping at sides, longest at outer apical angles and their apices subrectilinearly inclined to suture.

Legs well developed; protibia with a simple and unbordered outer edge; tibiae similar in shape, comparable in width and at subtruncate apex about 1 and 2/3 as wide as antennal club and without distinct spur at tarsal insertion; profemur about

1 and 1/3, mesofemur about 1.5 times and metafemur nearly twice as wide as corresponding tibiae, of usual outline and with somewhat convex anterior and posterior edges; protarsus somewhat wider than antennal club, meso- and metatarsi about as wide as antennal club, their claws moderately developed and strongly toothed at base.

Remarks. The sex of this specimen cannot be defined due to a rather thick milky cover around its abdomen, which can have sexual character in the shape of pygidium.

Family Smicripidae Horn 1879

This monogeneric family has never been recorded from fossils before. The new fossil species here described is rather similar to the recent species (see the below diagnosis). All the recent species of the genus occur in Central America and are registered from decaying flowers (from the genus *Pseudobombax* - Bombacaceae), leaf litter and under bark. The presence in the Eocene of Western Europe of this American family supports its possible great antiquity, at least in the Cretaceous. A similar distribution occurs for the Paleogene dragonfly family Palaeomacromiidae Petrulevicius, Nel & Muzon, 1999, known from Argentina and Italy (Petrulevicius & Nel 2007).

Genus *Smicrips* Le Conte 1878

Type species. *Smicrips palmicola* Le Conte 1878, recent.

Smicrips europeus nov. sp. (Figs 58–60, 85–87)

Material. Holotype PA 4167, male [complete beetle included into a flat amber plate].

Etymology. The epithet of this new species refers to the continent of origin of the type specimen.

Diagnosis. The fossil differs from all recent species in its somewhat broader body with the head wider than pronotum, much wider anterior part of pronotum and much wider and subflattened head with the very wide frons, much narrower and more subparallel-sided tibiae; markedly sparser dorsal puncturation and less conspicuous finer pubescence as well as smoothed integuments between punctures. Besides, it is also distinct from:

- *Smicrips distans* (Sharp, 1900) (examined type series in the Natural History Museum in London) in the flattened dorsum, much longer antennomere 2, much narrower and subparallel-sided tibiae;

- *Smicrips mexicanus* (Sharp, 1900) (examined type series in the Natural History Museum in London) in the widely rounded posterior angles of pronotum;

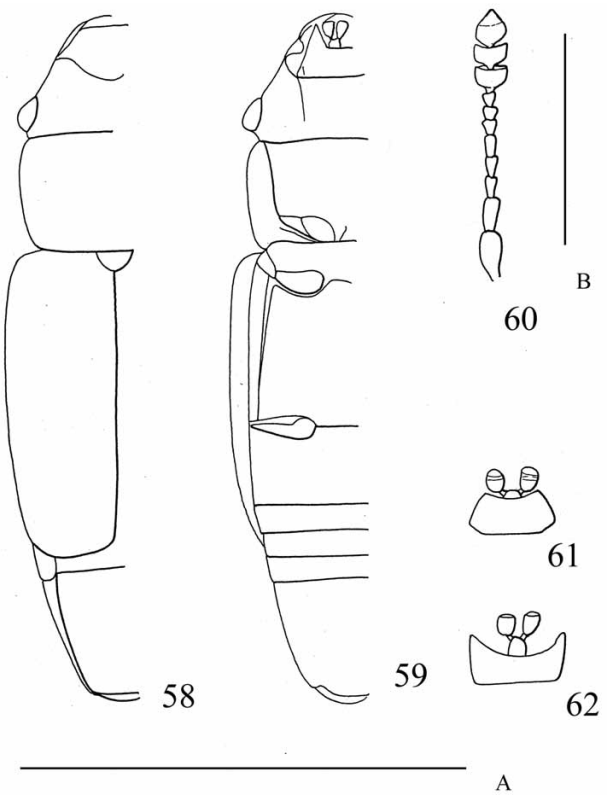
- *Smicrips chontalenus* (Sharp, 1900) (examined type series in the Natural History Museum in London) in widely rounded posterior angles of pronotum.

As this new species is very similar to the recent members of the genus, some of its characters are omitted in the description.

Description. Body 1.6 mm long, 0.5 mm wide, 0.2 mm high; elongate, subflattened dorsally and ventrally; subunicolorous brownish; slightly shining; dorsum and ventrite with well conspicuous, recumbent and short yellowish hairs about two times as long as distance between their insertions; thoracic sterna and underside of head with finer, shorter and less conspicuous hairs.

Head and pronotum with more or less distinct, shallow and small punctures, somewhat smaller than eye facets in diameter, interspaces between them markedly greater than a puncture diameter and more or less alutaceous, but at pronotal sides punctures becoming denser. Elytra with similar puncturation and sculpture, although punctures less distinct and sculpture somewhat more relief; uncovered tergites, ventrites 2-4 and hypopygidium with somewhat smaller and denser punctures than on head and pronotum, with very dense and fine microreticulation; prosternum as punctured as head and middle of pronotum, but with very dense and fine microreticulation; metaventrite and ventrite 1 with obsolete puncturation and microsculpture similar to that on prosternum.

Head subtriangular and prognathous, somewhat shorter than



Figures 58–62
Species of *Smicrips* (Smicripidae): **58-60**, *S. europeus* **nov. sp.**: **58**, body, dorsally; **59**, idem, ventrally; **60**, antenna, dorsally; *Smicrips* sp. (Natural History Museum in London: 'W. Indies', 'Soubise (Windward side), Grenada, W.I., H.H. Smith'); **61**, mentum and labial palpi, ventral; *Smicrips* sp. (Natural History Museum in London: 'W. Indies, St. Lucia, balionnean, 29.IV.84, H. Alam'); **62**, mentum and labial palpi, ventral. Scales: A, to figs 58, 59, 61, 62 representing bar of 1.0 mm; B, to figs. 60 representing bar of 0.25 mm.

long, slightly wider than pronotum, with rather large eyes not reaching prothoracic segment, subflattened; labrum apparently well exposed but boundary between it and frons invisible because a thick layer of amber; mandibles slightly exposed from under frons and labrum; antennae 11-segmented with three segmented loose club composing about 2/7 of total antennal length and consisting of antennomeres comparable in width and with ultimate one longest; scape about 2/3 as long as antennal club and somewhat narrower than the latter; antennomere 2 somewhat shorter and somewhat narrower than scape; antennomeres 3-5 comparable in length, somewhat narrower and shorter than antennomere 2; antennomeres 6-8 comparable in length and shortest in antennae; mentum rather large, about 3/4 as long as wide, with subrectilinearly narrowing sides and strongly excised anterior edge, its anterior angles pointed and projecting anteriorly; ultimate maxillary palpomere subconical, slightly narrowing apically, about three times as long as wide at its thickest place; labial palpi moderately small and its ultimate segment somewhat longer than wide at apex.

Pronotum with subtruncate anterior and posterior edges, all angles rounded, widest in anterior 1/2, slightly and gradually narrowing anteriorly from base, posterior and lateral edges not bordered; its disk rather flat and sides rather sloping; scutellum moderately large and subtriangular; prosternum slightly convex and its process in narrowest place extremely narrow, moderately projecting till the level of posterior edge of coxae, nearly subparallel-sided and subtruncate at apex; procoxae distinctly transverse and with exposed trochantin; mesoventrite slightly convex and with the same plane as metaventrite; distance beween mesocoxae nearly three times and that between metacoxae nearly four times as great as that between procoxae; metaventrite slightly longer than prosternum with process, slightly convex, without both median line and paracoxal line before metacoxae; submesocoxal lines following closely to posterior edge of cavities and along anterior half of metepisterna; submesocoxal line not expressed; metacoxae not very wide; ventrites 1 somewhat longer than ventrites 2-4 combined and slightly shorter than wide, hypopygidium convex in the middle of its posterior edge and sinuate at each sides before apex; epipleura well expressed; pygidium apparently as long as wide and widely subtruncate at apex; apex of anal sclerite distinctly exposed from under apex of pygidium.

Elytra about 1 and 2/5 as long as wide combined, truncate at apices, subparallel-sided; with a small sutural angle, subflattened at disk and rather steeply sloping at sides and somewhat declined on ventral side, adsutural lines absent, leaving uncovered pygidium and previous tergite.

Legs well developed and quite narrow; trochanters rather of elongate type; tibiae slightly compressed, narrow, about as wide as scape, almost comparable in length and slightly widening apically; their apices somewhat oblique to subtruncate and with two clear spurs, outer edge of tibia simple; femora of usual shape, pro- and mesofemora about two times and metafemur about four times as wide as tibiae; tarsi five-segmented and comparatively short, tarsomeres 1-3 narrowly lobed (in anterior legs 2/3 as wide as tibiae, in intermediate and posterior ones somewhat narrower); tarsomere 4 very small and tarsomere distinctly longer than previous tarsomeres combined; claws simple, narrow and short.

Superfamily Tenebrionoidea Latreille 1802

Family Anthicidae Latreille 1819

Fossils of this family are known mostly from Baltic amber (Klebs 1910; Abdullah 1964; Larsson 1978; Spahr 1981; Hieke & 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 oldest record of this family is in the Lower Cretaceous Lebanese amber (Kirejtshuk & Azar 2008) and Burmese amber (Cockerell 1917: Eurygeniinae Le Conte 1862). The further Cenozoic records originated from Palaeocene (?Eocene) Sunchal (Cockerell 1926), boundary Eocene-Oligocene in Bembridge Marls (Kirejtshuk *et al.* in press), Lower Oligocene Florissant shales (Wickham 1910) and Aix-en-Provence (France) (Oustalet 1874) as well as from the Miocene Izarra beds (Spain) (Arillo & Ortuno 1997).

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 Eurigeniinae LeConte 1862 (?)

The new fossil seems to belong to this subfamily, although it is rather different from its other members (see diagnosis below). This group is known in fossils only after the description of '*Eurygenius*' *wickhami* Cockerell 1917 from the Lower Cretaceous Burmese amber, which could be indeed a member of the subfamily Macratriinae Leconte, 1862 (Kirejtshuk & Azar 2008).

Genus *Oisegenius* nov. gen.

Type species. *Oisegenius antiquus* **nov. gen., nov. sp**.

Etymology. The name of this new genus is formed from type locality (Oise Department in north of France) and '*genius*', usual suffix for generic names in the family Anthicidae; masculine gender.

Diagnosis. This fossil reminds the other representatives of the subfamily, but in general it is somewhat smaller in size and more robust. The type species of this new genus is characterized by the procoxal cavities seeming to be opened or very narrowly closed, contiguous metacoxal cavities, neck less than half as wide as head at eyes, not elongate antennomere 3, not emarginate eyes, lack of distinct spur, and rugose sculpture of the neck. These peculiarities make possible to approach this fossil to Eurygeniinae (well expressed 'frontoclypeal' suture, microtuberculate pronotum and elytra, and extremely narrow distances between both mesocoxae and metacoxae), although

it has some clear peculiarities that allow distinguishing it from the other groups of the subfamily. In first turn these concern the eyes that are not emarginate anteriorly in contrast to the known representatives of the subfamily. However even among the recent representatives this character varies to a great level, and some forms have a very feeble emargination. The flange of collar of the new fossil is rather narrow, but more or less distinct (especially clearly visible in the paratype). The lack of distinct tibial spurs makes it distinct from all members of Eurygeniinae and Macratriinae having such spurs.

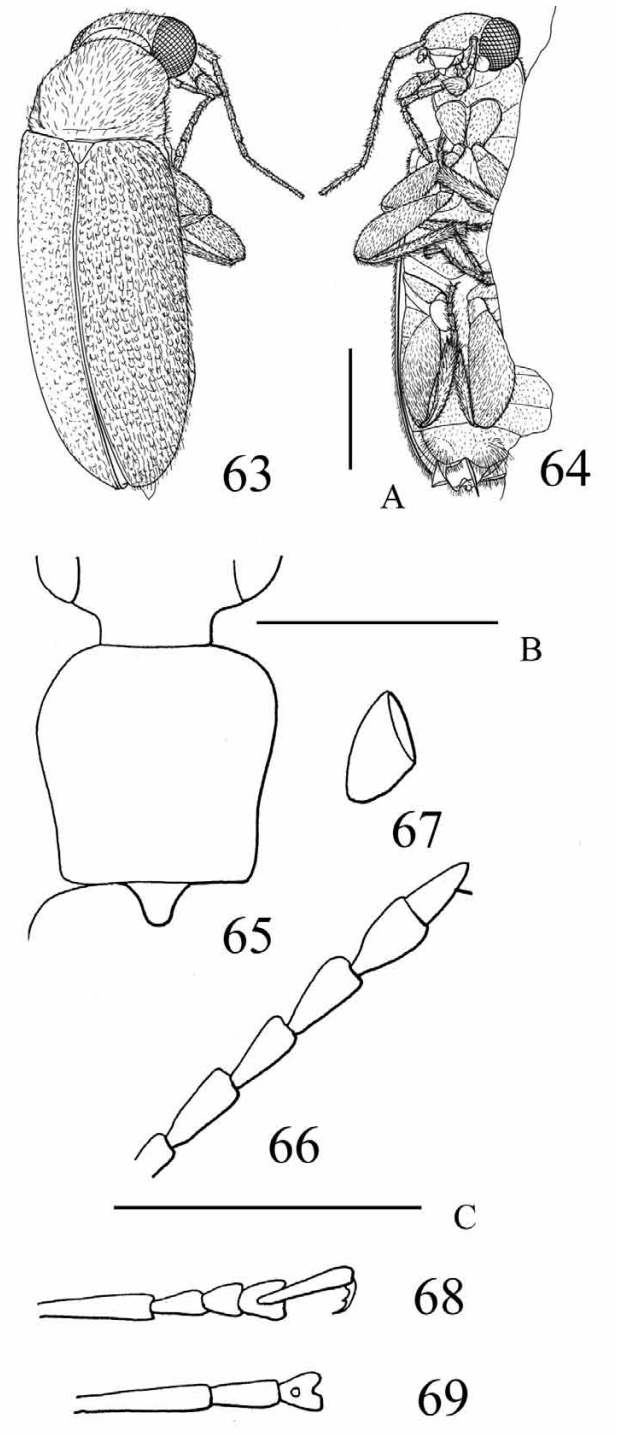
The subfamily Eurygeniidae is distinct due to the wide neck and emarginate eyes. In our new taxon this latter character is not expressed at all (see above and the description below). Besides, it is difficult to find a clear placement for this fossil in any of the known tribes of the subfamily. It is most probable that the new fossil should be regarded as a member of the tribe Eurygeniini because of the pronotum bearing a distinct apical flange of collar, although its procoxal cavities are not visible enough to determine whether they are open externally or not. Besides, the type species of the new genus has very coarse and diffuse scupture of dorsum, rather similar to that in species of *Eurygenius* Ferté-Senecrète, 1849.

'*Eurygenius*' *wickhami* Cockerell 1917 seems to be also a member of the subfamily Macratriinae, but not Eurygeniinae. At least its long and modified antennae and shape of maxillary palpi are similar to those in the species of Macratriinae from the Lebanese amber (Kirejtshuk & Azar 2008) rather than to those of Eurygeniinae. The species here considered differs from that from Burmese amber according to the description of the latter in the smaller and much more robust body, shorter head with smaller eyes and smaller mandibles, shorter antennae, shorter maxillary palpi with the rather widened ultimate palpomere, not 'subcircular' pronotum, shorter legs, and lack of tibial spurs, subuniform sculpture, and puncturation of elytra.

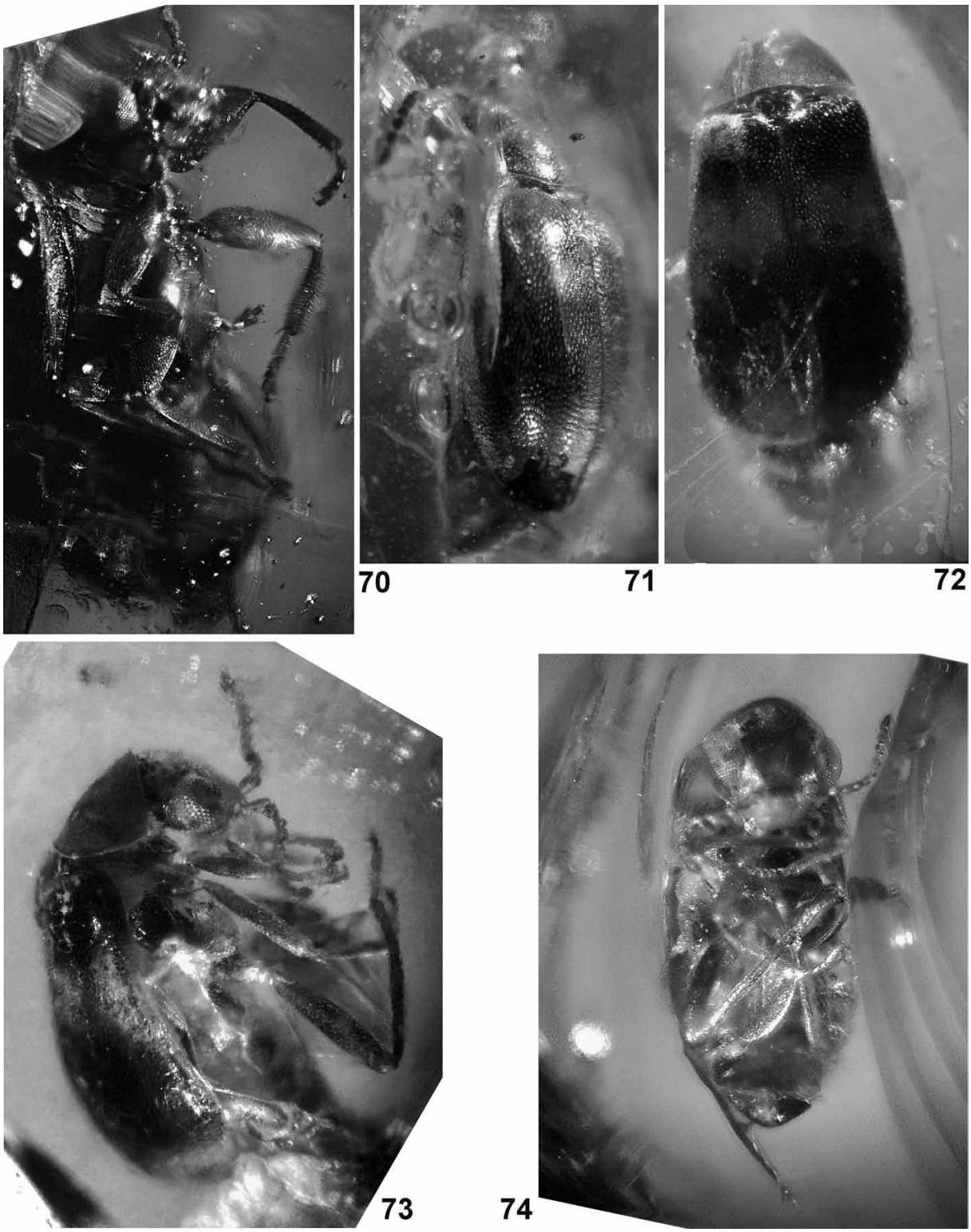
Oisegenius antiquus nov. sp. (Figs 63–69, 88)

Material. Holotype PA 1154, male [almost complete beetle with missing ultimate right antennomere and slightly covered with milky fogging, together with one medium-sized Coleoptera: Anobiidae, two Hymenoptera: Chalcidoidea and one Psocoptera: Lachesillidae, included in an elongate amber piece. A print of another coleopterous specimen (probably the same anthicid species) is at about 10 mm from the type]. Paratype PA 1781 11/15, female [anterior part of the beetle showing the head with appendages, prothoracic segment with anterior legs and base of pterothorax with base of elytra included in a quadrangular side of an elongate amber bar, together with the paratype of *Colotes constantini* n. sp (10/15) and one small Hymenoptera (11/16)].

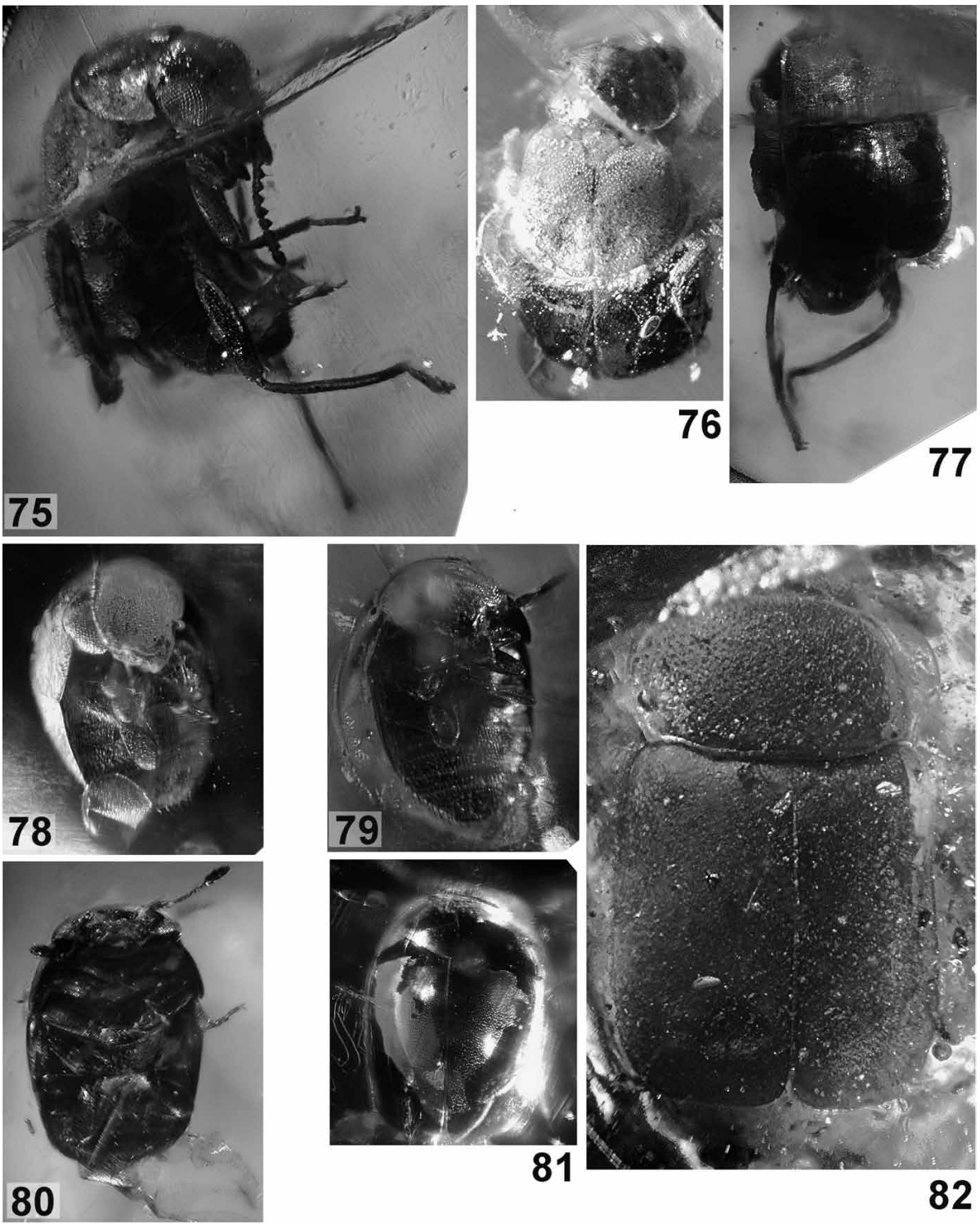
Description. Holotype. Body 4.6 mm long, 1.7 mm wide, 1.3 mm high; elongate, rather convex both dorsally and ventrally; brownish grey with some silver-bronze lustre; dorsum with very dense and fine, suberect, moderately conspicuous, silvery grey hairs, less dense on head and pronotum and more dense on elytra, where they are about five times as long as distance



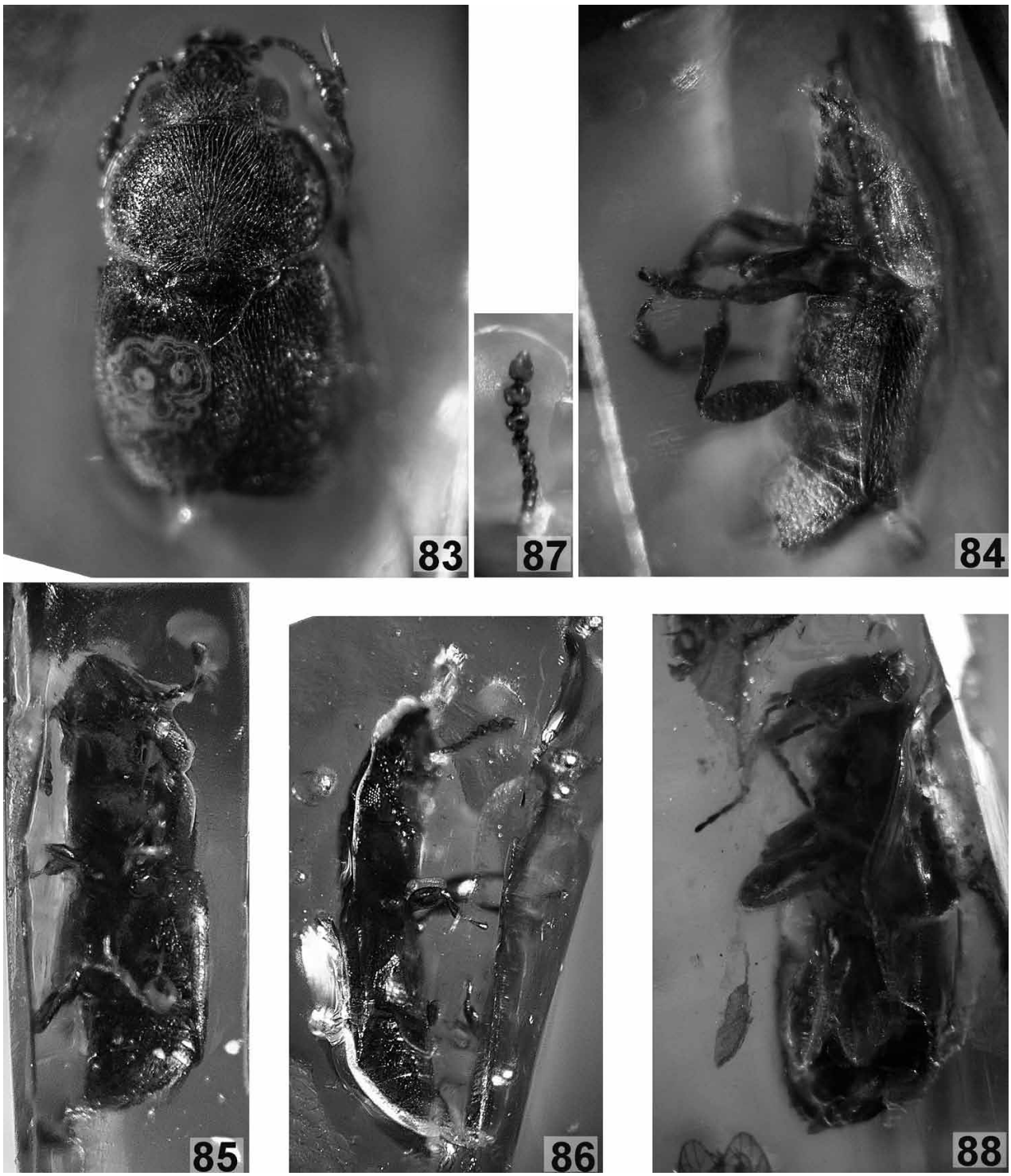
Figures 63–69
Oisegenius antiquus **nov. gen., nov. sp.** (Anthicidae): **63**, body, laterodorsally; **64**, idem, lateroventrally; **65**, pronotum with base of head and base of elytra, dorsally; **66**, apex of antenna, dorsally; **67**, ultimate maxillary palpomere, ventrally; **68**, mesotarsus, dorsally; **69**, metatarsus, dorsally. Scales: A, to figs 63, 64 representing bar of 1.0 mm; B, to fig. 65 representing bar of 1.0 mm; C, to figs. 66, 68, 69 representing bar of 1.0 mm.



Figures 70–74
70, *Cyphon gallicus* **nov. sp.** (Scirtidae), holotype PA 3404, body, lateroventral, length of inclusion 3.4 mm. **71,** *C. lobanovi* **nov. sp.** (Scirtidae), holotype PA 5605, body, laterodorsal, length of inclusion 2.1 mm. **72, 73, 74,** *Colotes constantini* **nov. sp.** (Melyridae), holotype PA 9530, length of inclusion 2.4 mm: 72, body, dorsal; 73, idem, lateral; 74, idem, ventral.



Figures 75–82
75, 76, 77, *Colotes impexus* **nov. sp.** (Melyridae), holotype PA 890, length of inclusion 2.2 mm: 75, body, lateroventral; 76, idem, dorsal; 77, idem, posterodorsal. **78, 79,** *Pastillocenicus longifrons* **nov. gen., nov. sp.** (Nitidulidae): 78, paratype PA 1032, body, lateroventral, length of inclusion 0.9 mm; 79, holotype PA 5132, body, ventral, length of inclusion 1.0 mm. **80,** *P. grandiclavis* **nov. gen., nov. sp.** (Nitidulidae), holotype PA 602, body, ventral, length of inclusion 0.9 mm. **81,** *P. polyaki* **nov. gen., nov. sp.** (Nitidulidae), holotype PA 8980, body, dorsal length of inclusion 0.9 mm. **82,** *Hetherelus expressus* **nov. sp.** (Kateretidae), holotype PA 1937, body, dorsal, length of inclusion 3.6 mm.



Figures 83–88
83, 84, *Eoceniretes yantaricus* **nov. gen., nov. sp.** (Kateretidae), holotype PA-9167, length of inclusion 2.2 mm: 83, body, dorsal; 84, idem, lateral. **85, 86, 87,** *Smicrips europeus* **nov. sp.** (Smicripidae), holotype PA 4167, length of inclusion 1.6 mm: 85, body, lateroventral; 86, idem, lateral; 87, antenna. **88,** *Oisegenius antiquus* **nov. gen., nov. sp.** (Anthicidae), holotype PA 1154, body, lateroventral, length of inclusion 4.6 mm.

between their insertions; underside with much shorter and subrecumbent hairs, scarcely longer than distance between their insertions.

Head integument not visible because of milky cover and its position, but it seemingly very densely microtuberculate (about as pronotum) and sculpture of neck rather rugose than smoothed; pronotum also with milky cover, although dense microtuberculate integument clearly visible, very dense tubercles about as large as eye facets in diameter; elytra with similar sculpture, but tubercles 2-3 times as large as those on head and pronotum, interspaces between them somewhat narrower than a tubercle diameter, integument smoothly microreticulated; prosternum with rather shallow and quite distinct punctures about as large as tubercles on head and pronotum, interspaces between them somewhat narrower than a puncture diameter, very densely and finely microreticulated; metaventrite about as punctured and sculptured as prosternum, but punctures somewhat denser, shallower and less distinct; ventrites with indistinct, denser and smaller punctures than those on thoracic sterna, interspaces between them with rather contrasting dense microreticulation; although hypopygidum very densely and very finely microtuberculate.

Head markedly longer than distance between rather large eyes (consisting of comparatively fine facets) with not emarginate anterior edge, gently swollen frons transversely abrupt at anterior edge; antennal insertions rather close to eye edge and frons above them slightly elevated; temples unraised; neck rather short (about as long as each of antennomeres 3-5 and about 3/5 as wide as as head at eyes), with distinct subbasal line and almost 3/5 as wide as head at eyes; 'frontoclypeal' suture well expressed; labrum and mandibles clearly not visible; antennae subfiliform and almost twice as long as head wide; scape somewhat wider than flagellomeres (except ultimate one) and about four times as long as thick; antennomere 2 less than half as long as scape; antennomeres 3-8 subcylindrical: antennomeres 3-5 somewhat longer than antennomeres 6-8; antennomeres 9 and 10 enlarged apically and dorsoventrally compressed; ultimate antennomere thickening in proximal half and in distal half narrowing to acuminate apex; eyes arcuately enlarging on underside; mentum and palpomeres mostly invisible, although ultimate maxillary palpomere quite large and securiform, and ultimate labial palpomeres rather small, elongate and somewhat narrowing apically; gular sutures invisible.

Pronotum slightly longer than wide (to nearly as long as wide), moderately and evenly convex at disk and steeply sloping at sides, widest before anterior edge; its sides slightly subsinuate at base and evenly widened anteriorly, without distinct carine; its apex with a very narrow flange of collar; scutellum subtriangular and widely rounded at apex; prosternum medially subflattened, its length before procoxae somewhat shorter than the latter; procoxae subtriangular with longest outer edge and rather projecting (apparently open posteriorly); distance between mesocoxae and that between metacoxae extremely narrow; mesoventrite not visible; metaventrite medially subflattened and about twice as long as procoxae; premetacoxal lines well expressed; metacoxal cavities contiguous; abdominal ventrite 1 longest and about as long as ventrites 2 and 3 combined; hypopygidium somewhat shorter than ventrite 1 somewhat excavate before angularly excised posterior edge and with a swollen places bearing somewhat longer hairs at each side of subapical depression; pygidium very widely rounded to subtruncate at apex.

Elytra complete and about 1.5 times as long as wide combined, moderately convex at disk and steeply (subvertically) sloping at sides, longest at very small sutural angle; widest in anterior forth and very gently narrowing to separately rounded apices.

Legs well developed and rather long; all trochanters distinctly of elongate type; tibiae similar in shape and size, very slightly compressed and evenly covered with rather long setae, slightly narrower than ultimate maxillary palpomere, obliquely subtruncate at apex; without both outer borders and distinct spur (or the latter very short and thin and therefore not visible among the apical setae); femora rather enlarged apically and widest in distal third, profemur about twice, mesofemur somewhat more than twice and metafemur apparently about three times as wide as corresponding tibiae; tarsi characteristic of family, viz. protarsomere 1 widened apically (nearly as wide as tibiae) and about twice longer than wide; protarsomere 2 somewhat shorter and narrower; metatarsomeres 1 and 2 rather narrow with the former at least twice longer than the latter; metatarsomere 3 about twice wider than previous ones; 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.

Variation. Paratype: Looking like the holotype, although its sculpture of dorsum is clearer because of vicinity of the beetle to the amber surface. Elytron with coarse oval punctures reminding of the cells in the elytra of species of *Cupes* Fabricius, 1801.

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