



General Palaeontology, Systematics and Evolution (Invertebrate Palaeontology)

## New and little known weevils (Coleoptera: Curculionoidea) from the Paleocene of Menat (France)



### *Charançons nouveaux et peu connus (Coleoptera : Curculionoidea) du Paléocène de Menat (France)*

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#### ABSTRACT

Two new genera *Petropsis* gen. n., and *Menatorhis* gen. n., and two species, *Petropsis rostrata* gen. et sp. n. (Ithyceridae) and *Perapion menatensis* sp. n. (Brentidae), are described from the Paleocene of Menat (France). *Petropsis rostrata* gen. et sp. n. is similar to *Cretocar luzzii* Gratshev et Zherikhin (2000) but differs from it in the comparatively short ventrites 1 and 2, almost straight and not dilated metatibiae, short precoxal portion of the prosternum, slightly convex elytra and antennae inserted more closely to the middle of the rostrum. *Perapion menatensis* sp. n. is similar to *Perapion antiquum* (Gyllenhal, 1833) but differs from it in the straight rostrum, sparser and finer punctures of the pronotum, and somewhat larger body. The families Ithyceridae and Brentidae are recorded for the first time in the Paleocene of Menat. The systematic positions of *Balaninus elegans* Piton (1940) (type species of *Menatorhis* gen. n.) and *Hipporhinus ventricosus* Piton (1940) are discussed.

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#### R É S U M É

Deux genres nouveaux, *Petropsis* gen. n. et *Menatorhis* gen. n., et deux espèces, *Petropsis rostrata* gen. et sp. n. (Ithyceridae) et *Perapion menatensis* sp. n. (Brentidae), sont décrits du Paléocène de Menat (France). *Petropsis rostrata* gen. et sp. n. est similaire à *Cretocar luzzii* Gratshev et Zherikhin (2000), mais en diffère par ses ventrites 1 et 2 relativement courts, ses métatibias presque droites et non dilatés, la portion précostale du prosternum courte, ses élytres faiblement convexes et ses antennes insérées plus près du milieu du rostre. *Perapion menatensis* sp. n. est similaire à *Perapion antiquum* (Gyllenhal, 1833), mais en diffère par son rostre droit, des ponctuations du pronotum moins denses et plus petites et son corps relativement plus grand. Les familles Ithyceridae et Brentidae sont signalées

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pour la première fois du Paléocène de Menat. Les positions systématiques de *Balaninus elegans* Piton (1940) (espèce type de *Menatorhis* gen. n.) et d'*Hipporhinus ventricosus* Piton (1940) sont discutées.

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## 1. Introduction

The curculionoids are one of the main parts of modern terrestrial ecosystems. Beginning at the Middle–Late Jurassic boundary, they appear in the fossil record (Legalov, 2015). Brentidae Billberg, 1820 and Curculionidae Latreille, 1802 were recorded in deposits of the middle of the Early Cretaceous. These groups are quite diverse in the modern fauna (Legalov, 2014; Zherikhin and Gratshev, 2004). The curculionoids are rather frequent in Neogene outcrops (Legalov, 2015; Kirejtshuk et al., 2016b). Paleogene curculionoids were mostly described from the Eocene–Oligocene, particularly from the Aix-en-Provence, Green River and Florissant paleolakes, and from Baltic amber. Paleocene weevils have been recorded only from six localities: one species of the subfamily Molytinae Schoenherr, 1823 has been found from Arkhara (Danian in Russia); 22 species are known from separate elytra from Spitsbergen (Danian in Norway), Sunchal (probable Eocene in Argentina) and Peckham (late Eocene in England) (Cockerell, 1920, 1925, 1936; Heer, 1870; Legalov, 2010). One member of the tribe Tanaini Schoenherr, 1823 (Brentidae: Apioninae Schoenherr, 1823) was described from Tadushi of the late Oligocene–early Miocene in the Russian Far East (Legalov, 2015). Menat is one of the richest Paleocene outcrops, although for now only six curculionoid species have been described from there (Piton, 1940).

Here we redescribe two of Piton's species and describe two species of the families Ithyceridae Schoenherr, 1823 and Brentidae.

## 2. Material and methods

The holotypes of the Piton's species (*Menatorhis elegans* [Piton, 1940], comb. n. and *Hipporhinus ventricosus* Piton, 1940), here redescribed, are deposited in the collection of the Museum national d'histoire naturelle in Paris (later MNHN) and the holotypes of the newly described species (*Petropsis rostrata* gen. et sp. n. and *Perapion menatensis* sp. n.) are deposited in the Menat Town Museum, Village of Menat, Puy-de-Dôme (further MTM). The specimens were studied using a stereomicroscope Olympus SCX9 in MNHN. The specimens were also examined with a Tescan Vega LSU scanning electron microscope in MNHN with the Low Vacuum Secondary Electron TESCAN Detector (LVSTD).

## 3. Geological setting and locality information

The middle Paleocene Menat fossil site (Menat Basin, Puy-de-Dôme, France) is a volcanic maar containing a paleolake ca. 1 km in diameter, which at present contains sedimentary rocks (spongo-diatomites) with remains of

diverse aquatic and terrestrial flora and fauna (Nel, 1989, 2008; Piton, 1940, etc.). The composition of faunal and floral remains makes it possible to conclude that this lake was surrounded by a forest and the palaeoenvironment was warm and humid. Following the pollen, paleomammalian stratigraphic, and radiometric K/Ar analyses, the age of Menat was estimated as 59 Ma (Kedves and Russel, 1982; Nel, 2008). However, the new estimate based on macroflora postulated its age within 60–61 Ma (Wappler et al., 2009). Some preliminary results of studies on the beetle fauna from Menat outcrop were published by Nabozhenko and Kirejtshuk (2014) and Kirejtshuk et al. (2016a, 2016b).

## 4. Systematics

Family: Ithyceridae Schoenherr, 1823  
Subfamily: Chilecarinae Legalov, 2009  
Tribe: **Chilecarini** Legalov, 2009

### 4.1. Notes

The new genus belongs to the family Ithyceridae based on the homonomous ventrites, widened metatarsomere 1, short precoxal portion of the prosternum, not geniculate antennae inserted at the first third of the rostrum, rostrum without distinct antennal scrobes. The apices of the tibiae are scarcely visible, although the metatibiae do not show a trace of uncus. The new genus is externally somewhat similar to the genus *Anthonomus* Germar, 1817 (Curculionidae: Curculioninae: Anthonomini C.G. Thomson, 1859), which is characterized by the abdominal ventrites subequal in length; but it differs from the latter in the thickened rostrum without antennal scrobes, antennae inserted at the first third of the rostrum, widened metatarsomere 1 and tibiae lacking mucro. The pronotal sides of the holotype are without lateral carinae. It should be considered a member of the subfamilies present in the modern fauna. Unfortunately, the mandible structure important for discrimination of the subfamilies Chilecarinae Legalov, 2009 and Carinae C.G. Thompson, 1992 is not observable. Nevertheless, it can be assumed that the new genus is related to the tribe Chilecarini sensu stricto because the mandibles of the genera of the latter tribe are also scarcely visible. The representatives of Cretuliini Legalov, 2009, the second tribe of the subfamily Chilecarinae, differ in the wide elytra with rounded sides. The new genus is not related to the tribes Mesophyletini Poinar, 2006 and Anchineini Poinar and Legalov, 2014 from the Burmese amber because its precoxal cavities are contiguous and its antennae are not inserted in the middle part of the rostrum. It differs from the tribe Montsecanomalini (Early Cretaceous of Spain) in the elytra lacking scutellar striole. The comparatively short

abdominal ventrite 1 is very different from that in the tribe Carini.

*Petropsis* gen. n. Type species: *Petropsis rostratus* sp. n.

#### 4.2. Etymology

The name of the new genus is formed the Greek πέτρος (“petros”—stone, rock) and “ὄψις”(opsis—resembling a [specified] thing). Gender feminine.

#### 4.3. Diagnosis

Body heavily sclerotized. Rostrum thick, rather long, without antennal scrobes. Antennae not geniculate, inserted at first third of rostrum. Sides of pronotum without lateral carina. Elytra rather broad, not convex, without scutellar striae. Elytral sides almost straight. 9th striae not shortened. Pre- and postcoxal portions of prosternum short. Femora slightly thickened, without teeth. Tibiae without uncus.

Comparison. The new genus is similar to *Cretocar* Gratshev et Zherikhin, 2000 (Turonian of New Jersey) but distinguished from it in the comparatively short abdominal ventrites 1 and 2, almost straight and not dilated metatibiae, short precoxal portion of the prosternum, slightly convex elytra and antennae inserted distally from the midlength of the rostrum. From the genus *Martinsnetoa* Zherikhin et Gratshev, 2004 (Aptian–Albian of Carto Formation, Brazil), in which the place of antennal attachment is unknown, *Petropsis* gen. n. differs in the thicker rostrum, widened metatarsomere 1, rather short precoxal portion of the prosternum and not granulated tibiae. The genus *Arariperhinus* Santos et al., 2011 (Early Cretaceous of Carto Formation) is very similar to *Cretocar*, although the place of its antennal insertions and the shape of tarsomeres remain unknown. The new genus differs from the *Arariperhinus* in the comparatively short abdominal ventrites 1 and 2 and short precoxal portion of the prosternum. It is distinguished from the modern South American genera *Chilecar* Kuschel, 1992 and *Caenominurus* Voss, 1965 in the antennae inserted much more distantly from the base of the thicker rostrum, and smaller eyes that are not wider than the rostrum.

*Petropsis rostrata* sp. n.  
(Fig. 1)

#### 4.4. Etymology

The name derives from the Latin “rostratus” (having avian beak).

#### 4.5. Type locality and stratum

Menat Basin, Puy-de-Dôme, France. The middle Paleocene; approximately 60–61 Ma. The type locality is situated around the small lake near the village of Menat (46°06' N; 2°54' E). The specimen examined has been collected in a new, small outcrop south-east of the village of Menat.

#### 4.6. Holotype (? male)

“MNT 06-3526” deposited in MTM presented by the part and counterpart which are well preserved on rather smooth pieces of rock. The specimen shows the main parts of body sclerites in lateral view but most sclerites of its appendages are missing (particularly most antennomeres and tarsomeres are not traceable, except one metatarsomere 1 and some antennomeres of one antenna). The integument of its elytra bears some remains of puncturation and sculpture; the base of head and apex of prothorax have expressed transverse strigosity. The abdomen of the holotype seems to have six ventral segments probably because the apex of the pygidium was turned ventrally, creating the appearance of an additional segment.

#### 4.7. Description of holotype

Body dark. Rostrum rather thick, slightly curved, nearly cylindrical from base and to apical third, slightly narrowed further; about 8.7 times as long as wide at apex, about 5.6 times as long as wide in middle, about 4.6 times as long as wide at base. Fore part of head convex, sparsely punctate. Eyes rounded, slightly longer than wide, probably convex. Temples short, about 0.2 times as long as eye length. Scape (antennomere 1) about 2.8 times as long as wide at apex, slightly widened apically. Antennomere 2 (pedicel) about 2.3 times as long as wide at apex, 0.8 times as long as and subequal in width to scape. Antennomeres 3 and 4 long and narrow, antennomere 3 about 5.0 times as long as wide, antennomere 4 about 4.0 times as long as wide, about half as wide as antennomere 2. Base of head cross-hatching ventrally.

Pronotum about 0.7 times as short as rostrum. Disc slightly convex, finely punctate. Distance between punctures subequal or slightly larger than one puncture diameter.

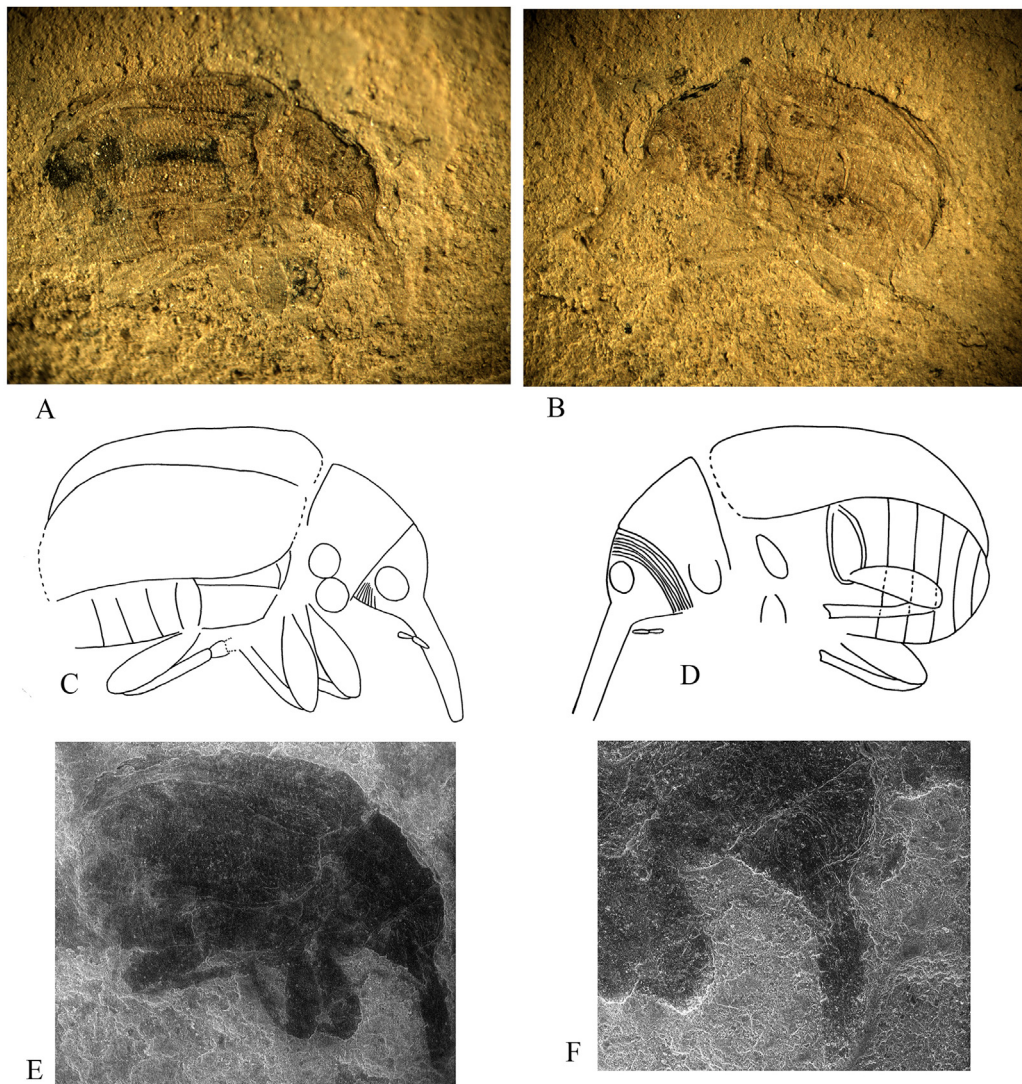
Elytra with weak humeri, about 2.5 times as long as pronotum, about 2.8 times as long as wide at base, about 2.3 times as long as wide in middle and about 3.3 times as long as wide in apical quarter. Intervals between striae flattened, 3.8–5.0 times as wide as striae. Striae distinct, with small oval punctures; distance between punctures larger than puncture diameter.

Precoxal cavities oval, contiguous. Pre- and postcoxal portions of prosternum subequal in length. Length of precoxal portion about 0.3 times as long as precoxal cavities. Mesocoxal cavities obliquely transverse, separated. Metanepisterna rather narrow, about 9.6 times as long as wide in middle.

Abdomen flattened, finely and transversely wrinkly-punctate. Ventrites subhomonomous. Ventrite 1 about 0.7 times as long as metacoxal cavity. Ventrite 2 about 1.2 times as long as ventrite 1. Ventrite 3 equal in length to ventrite 2. Ventrite 4 about 0.8 times as long as ventrite 3. Ventrite 5 longer than ventrite 4.

Legs rather long. Femora subequal in width. Pro- and metafemora about 3.3 times as long as wide in middle. Tibiae elongate, almost straight. Apices of metatibiae without uncus and mucro. Protibiae about 7.3 times as long as wide in middle. Metatibiae about 7.7 times longer than wide in





**Fig. 1.** *Petropsis rostrata* gen. et sp. n. from Paleocene of Menat, holotype. A. Body, lateral view, stereomicroscope. B. Body, ventro-lateral view, stereomicroscope. C. Contour of body, lateral view. D. Contour of body, ventro-lateral view. E. Body, lateral view, electronic microscopy. F. Head and rostrum, lateral view, electronic microscopy. Body length: 6.0 mm.

**Fig. 1.** *Petropsis rostrata* gen. et sp. n. du Paléocène de Menat, holotype. A. Corps, vue latérale, stéréomicroscope. B. Corps, vues ventrale et latérale, stéréomicroscope. C. Contour du corps, vue latérale. D. Contour du corps, vues ventrale et latérale, stéréomicroscope. E. Corps, vue latérale, microscope électronique. F. Tête et rostre, vue latérale, microscope électronique. Longueur du corps : 6,0 mm.

middle. Metatarsomere 1 widened, about 1.1 times as long as wide at apex and about 1.3 times as wide as metatibiae.

Body length (without rostrum) 4.7, rostrum length 1.3 mm.

#### 4.8. Notes

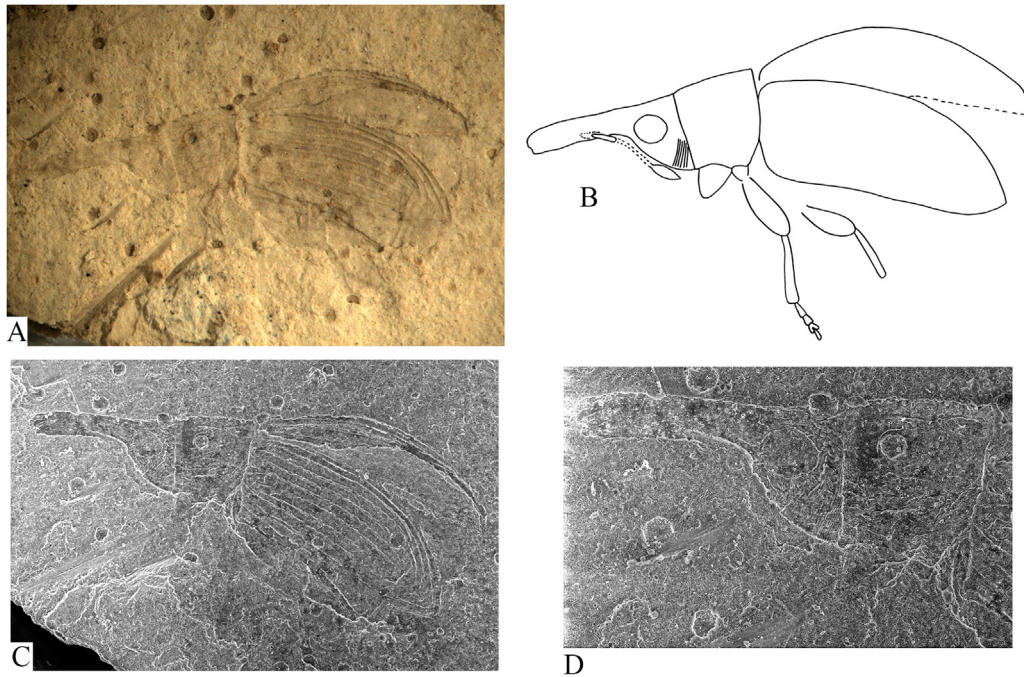
The Ithyceridae is a “relict” curculionoid group, but it was rather diverse in the Early Cretaceous (Legalov, 2015). Several species are known also from the Late Cretaceous (Gratshev and Zherikhin, 2000; Legalov, 2015; Legalov and Poinar, 2015). This species is the unique fossil Cenozoic representative of the Chilecarinae. Two fossil genera of

the subfamily Ithycerinae were known from the Eocene of North America (Legalov, 2013, 2015).

Family: Brentidae Billberg, 1820  
Subfamily: Apioninae Schoenherr, 1823  
Tribe: Aplemonini Kissinger, 1968  
Genus: ***Perapion*** Wagner, 1907

#### 4.9. Notes

The new species belongs to the family Brentidae based on the non-geniculate antennae, elongated trochanters completely separating femora and coxae and elytra lacking scutellar striole. The long trochanters completely separating femora and coxae, not geniculate antennae, visible



**Fig. 2.** *Perapion menatensis* sp. n. from Paleocene of Menat, holotype. A. Body, lateral view, stereomicroscope. B. Contour of body, lateral view. C. Body, lateral view, electronic microscopy. D. Head, rostrum and pronotum, lateral view, electronic microscopy. Body length: 4.6 mm.

**Fig. 2.** *Perapion menatensis* sp. n. du Paléocène de Menat, holotype. A. Corps, vue latérale, stéréomicroscope. B. Contour du corps, vue latérale. C. Corps, vue latérale, microscope électronique. D. Tête, rostre et pronotum, vue latérale, microscope électronique. Longueur du corps : 4,6 mm.

scutellum, subconical procoxae suggest a placement of this genus in Apioninae. Discrimination of the tribes in this subfamily is mainly based on characters not observable in fossils, so we use a comparison of the genera with the short thickened rostrum and antennae inserted near the middle of the rostrum as in the new species. This character is peculiar to the genera *Melanapion* Wagner, 1930 (Kalcapiini Alonso-Zarazaga, 1990), *Archinvolvulus* Voss, 1972, and *Neocyba* Kissinger, 1968 (Rhadinocybini Alonso-Zarazaga, 1992), *Tanaos* Schoenherr, 1826 (Tanaini) and the genera of Aplemonini Kissinger, 1968. The species of *Melanapion* are characterized by the curved rostrum, antennae inserted at the base of the rostrum and wide striae, but our specimen has the straight rostrum, antennae inserted in the middle of the rostrum and elytra with narrow striae. The representatives of the tribe Rhadinocybini differ from considered tribes (i.e. Kalcapiini, Rhadinocybini, Tanaini, and Aplemonini) in the rather narrow elongate pronotum, but the new species has a short and wide pronotum. The rostrum of *Tanaos* is thick and short, shorter than the head, and rather short tibiae with mucro and apical comb of small spines, whereas the new species has a comparatively thin rostrum, which is longer than pronotum, and a rather long and not widened tibiae lacking mucro and apical spines. The tribe Aplemonini differs from similar tribes in the contiguous mesocoxae, but this character is not visible in our fossil. Nevertheless the Aplemonini can be characterized by the following additional characters: antennae inserted near middle of rostrum, more or less straight and thick rostrum usually slightly longer than pronotum, pronotum generally broad, and also elytra elongate but not strongly convex.

The species under description completely fits these characteristics. It can be placed in the genus *Perapion* because it particularly demonstrates the straight sides of its pronotum, elytra and pronotum without semierect hairs, and also a subcylindrical rostrum.

*Perapion menatensis* sp. n.

(Fig. 2)

#### 4.10. Etymology

The name derives from the locality of origin of the holotype.

#### 4.11. Type locality and stratum

Menat Basin, Puy-de-Dôme, France. The middle Paleocene; approximately 60–61 Ma. Type locality is situated around the small lake near the village of Menat (46°06' N; 2°54' E). The specimen examined was collected in a new, small outcrop near the south-east of the village of Menat.

#### 4.12. Holotype (female)

“MNT 05 167” deposited in TMT. The imprint of the holotype (part) is well preserved in a matrix of rock which is somewhat smooth and slightly becoming loose. The specimen demonstrates many body sclerites in lateral view but missing most sclerites of its appendages (particularly most antennomeres and tarsomeres are not traceable, except one intermediate leg with the entire tarsus and one posterior leg without tarsus: besides, the scape and club of



one antenna are observable). The integument of the elytra has clear striation and somewhat obliterated punctures; below part of the head base bears transversely strigose; some punctures are traceable on the prothorax.

Description of holotype. Body probably dark. Rostrum thick, straight, subcylindrical, finely punctate. Rostrum about 4.5 times as long as wide at apex, about 4.2 times as long as wide in middle, about 3.7 times as long as wide at base. Forehead flat, densely punctate. Eyes oval, about 1.1 times as long as wide in middle, probably convex. Temples quite short, about 0.4 times as long as eye length. Antennae inserted almost in middle of rostrum, reaching front edge of pronotum. Scape (anennomere 1) about 3.7 times as long as wide at apex. Funicle (antennomeres 2–8) not clearly expressed, about 1.9 times as long as scape. Club fusiform, about 2.8 times as long as wide in middle, about 0.7 times as long as flagellum. Base of head cross-hatching ventrally.

Pronotum about 0.8 times as long as rostrum. Disc flat, sparsely and finely punctate. Distance between punctures significantly larger than puncture diameter. Sides of pronotum straight.

Elytra with weak humeri, about 3.1 times as long as pronotum, about 2.8 times as long as wide at base, about 2.5 times as long as wide in middle and about 4.1 times as long as wide at apical quarter. Intervals between striae flattened, wide, 5.0–6.0 times as wide as striae. Striae distinct and fairly deep.

Procoxae large, conical. Legs rather long. Femora without teeth. Profemora about 2.2 times as long as wide in middle. Mesofemora about 3.2 times as long as wide in middle. Tibiae elongated, almost straight, without mucro. Protibiae about 6.3 times as long as wide in middle. Mesotibiae about 7.5 times as long as wide in middle. Protarsi only traceable. Protarsomeres 1 and 2 trapezoidal. Protarsomere 1 about 2.3 times as long as wide at apex and about 0.7 times as wide as tibiae. Protarsomere 2 about as long as wide, about 0.6 times as long as and about 1.3 times as wide as tarsomere 1. Protarsomere 3 bilobed, about 0.8 times as long as wide at apex, subequal in length and about 1.2 times as wide as tarsomere 2. Tarsomere 5 about 4.0 times as long as wide at apex, about 1.6 times as long as and about 0.3 times as wide as tarsomere 3.

Body length (without rostrum) 3.6, rostrum length 1.0 mm.

Comparison. The new species is similar to the Recent *Perapion antiquum* (Gyllenhal, 1833) from South Africa but differs in the straight rostrum, sparser and smaller punctures on the pronotum and slightly greater body size.

#### 4.13. Note

At present, this new species is the oldest known representative of the tribe Aplemonini.

Family: Curculionidae Latreille, 1802

Subfamily: Curculioninae Latreille, 1802

Tribe: Curculionini Latreille, 1802

Subtribe: ? Curculionina Latreille, 1802

Genus *Menatorhis* gen. n.

Type species: *Balaninus elegans* Piton, 1940

#### 4.14. Etymology

The name of the new genus is formed from the name of the locality from where the holotype of the type species originated (Menat) and Greek “ $\rho\acute{\iota}\zeta$ ” (“ $\rho\acute{\iota}\nu\omicron\zeta$ ”) (rhīs, rhinos–нос). Gender feminine.

#### 4.15. Diagnosis

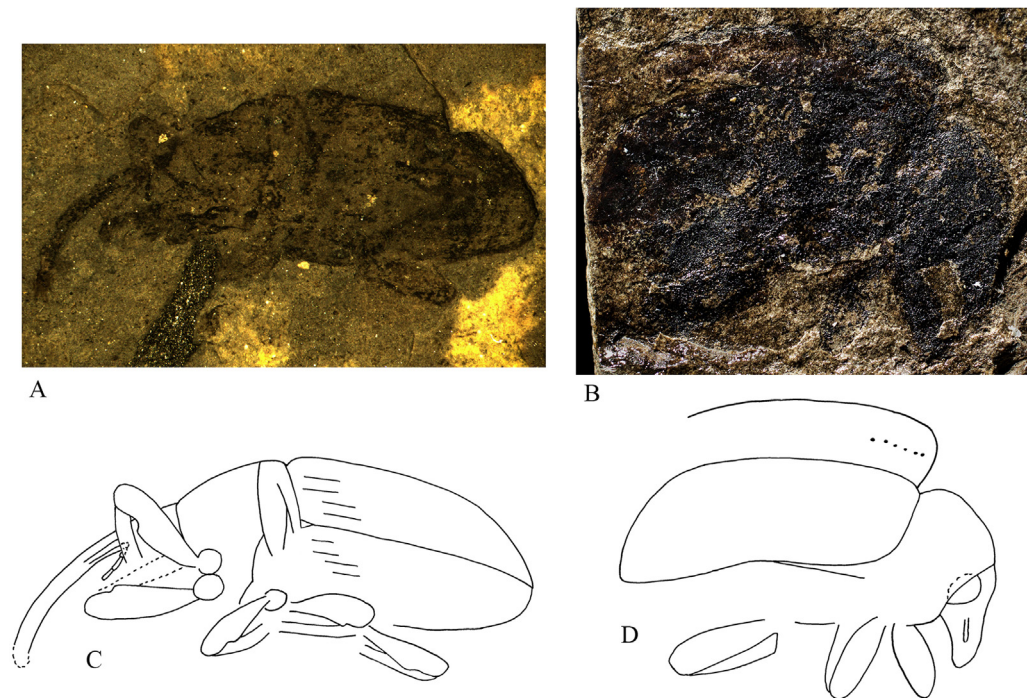
Body sclerotized. Rostrum thick, long, with lateral antennal scrobes. Antennae geniculate, inserted before middle of rostrum. Eyes apparently medium-sized. Pronotum trapezoidal with maximum width at base. Elytra elongate, gently narrowing at apical third, without laterobasal angles sharp, with weak humeri. Lateral elytral edges from lateral view not sinuate above metepisternum. Procoxal cavities contiguous. Metafemora weakly clavate, with blunt teeth, clearly not reaching elytral apices.

#### 4.16. Comparison and remarks

The new genus differs from all the genera of tribe Curculionini sensu stricto in the elongate elytra gently narrowing at apical third. *Menatorhis* gen. n. is rather similar to *Curculio* Linnaeus, 1758 but differs from it in the weakly convex humeri and metafemora not reaching elytral apices, as well as medium-sized eyes. This new genus differs from *Indocurculio* Pajni, Singh et Gandhi, 1994 (subtribe Curculionina sensu stricto) in the lateral antennal scrobes. It can be compared with the genera of the subtribe Timolina Heller, 1925, but it differs from them in the weakly thickened metafemora with blunt teeth. The subtribe Erganiina Pelsue et O'Brien, 2011 differs from the new genus and other Curculionini in the connate claws and robust body. The structure of tarsal claws is not known in our fossil, but the body of *Menatorhis* gen. n. is clearly elongate in contrast to members of Erganiina. The comparatively small beetles with the pronotum widest near middle are united in the subtribe Archariina Pelsue et O'Brien, 2011. The new genus differs from the members of this subtribe in the prothorax with maximum width at base and rather larger body size (7.5 mm). The elytra without sharp latero-basal angles and the elongate body distinguish *Menatorhis* gen. n. from the members of the subtribe Labaninina Pelsue et O'Brien, 2011. The nearly straight lateral elytral edges of the new genus are quite different from those in the genera of the subtribe Pseudobalaninina Heller, 1925, characterized by the lateral margin of elytra in lateral view sinuate above metepisternum.

#### 4.17. Notes

The holotype accessible for study represents an imprint of the beetle showing mostly the underside. However, the picture published by Piton (1940) seems to show the opposite imprint of this specimen. Probably Piton (1940) was studying two prints of the same specimen. Unfortunately, the main characters mentioned by this author and important to the diagnosis are not applicable to the imprint under study. This circumstance obliges us to seek additional accessible features. The beetle has a long and weakly



**Fig. 3.** Curculionidae from Paleocene of Menat, holotype. A. *Menatorhis elegans* comb. n., holotype, body, lateral view, stereomicroscope. B. *Menatorhis elegans* comb. n., holotype, contour of body, lateral view. C. Naupactini gen. indet. *ventricosus*, holotype, body, lateral view, stereomicroscope. D. Naupactini gen. indet. *ventricosus*, holotype, contour of body, lateral view. Body length: 10.8 mm (*Menatorhis elegans* comb. n.) and 20.9 mm (Naupactini gen. indet. *ventricosus*).

**Fig. 3.** Curculionidae du Paléocène de Menat, holotype. A. *Menatorhis elegans* comb. n., holotype, corps, vue latérale, stéréomicroscope. B. *Menatorhis elegans* comb. n., holotype, contour du corps, vues ventrale et latérale, stéréomicroscope. C. Naupactini gen. indet. *ventricosus*, holotype, corps, vue latérale, stéréomicroscope. D. Naupactini gen. indet. *ventricosus*, holotype, contour du corps, vue ventro-latérale. Longueur du corps : 10,8 mm (*Menatorhis elegans* comb. n.), 20,9 mm (Naupactini gen. indet. *ventricosus*).

curved rostrum with clear antennal grooves directed to the eyes, pronotum nearly as wide as elytral base, contiguous procoxal cavities, thickened femora with blunt teeth, and clearly striate elytra without scutellar striola. These characters make it possible to put this species into the tribe Curculionini sensu stricto including 15 genera from six subtribes (Pelsue and O'Brien, 2011). The new genus could be regarded as a member of Timolina or Curculionina, which differ in the pygidium completely covered by elytra in males or not. Because the examined specimen of *Menatorhis elegans* comb. n. is a female, it is impossible to put it in any of these two tribes.

*Menatorhis elegans* (Piton, 1940), comb. n.  
*Balaninus elegans* Piton, 1940, p. 197–198, fig. 63.  
 (Fig. 3A and C)

#### 4.18. Type locality and stratum

Menat Basin, Puy-de-Dôme, France. Middle Paleocene; approximately 60–61 Ma. Type locality is situated around the small lake near the village of Menat (46°06' N; 2°54' E).

#### 4.19. Holotype (female)

“R07010” deposited in MNHN. The imprint of the holotype (part) is poorly preserved. It represents the body in lateral view with rather obliterated sclerites and sculpture of integument, although the traces of many body sclerites,

tibiae and femora, and also basal antennomeres of one antenna are observable. The integuments of the elytra are strongly obliterated and only some remains of striae can be seen at the elytral base. The imprint is entombed in hard rock.

#### 4.20. Redescription of holotype

Body probably dark. Rostrum thin, curved, subcylindrical, probably punctate; about 10.1 times as long as wide in middle. Antennae inserted almost before middle of rostrum. Scape (antennomere 1) long, about 9.1 times as long as wide at apex. Antennomere 2 about 2.5 times as long as wide, about 0.25 times as long as scape. Antennomere 3 about 3.5 times as long as wide, about 1.4 times as long as antennomere 2. Antennomere 4 about 3.0 times as long as wide, about 0.9 times as long as antennomere 3. Antennal scrobes directed to eye.

Pronotum probably wide trapezoidal with almost straight lateral edges, about 0.7 times as long as rostrum. Disc probably flat, finely punctate. Base of pronotum subequal in width to base of elytra. Scutellum subtriangular.

Elytra with weak humeri, about twice as long as pronotum, about 1.7 times as long as wide at base and in middle and about 3.0 times as long as wide at apical quarter. Intervals between striae flattened, wide, about 5.0–6.0 times as wide as striae. Striae narrow and distinct.

Procoxal cavities oval, contiguous and shifted to anterior edge of prothorax (probably as result of postmortem changes because in Recent members of Curculionini, they are located close to the posterior prothoracic edge).

Legs rather long. Femora clavate, with blunt teeth. Profemora 3.2–3.3 times as long as wide in middle. Mesofemora 2.9–3.2 times as long as wide in middle. Metafemora about 3.3 times as long as wide in middle. Tibiae elongate, almost straight, rather wide. Protibiae about 0.5 times as wide as wide of femora in middle. Metatibiae 6.8–7.2 times as long as wide in middle.

Body length (without rostrum) 7.5 mm, rostrum length 3.3 mm.

Subfamily: Entiminae Schoenherr, 1823

Tribe: Naupactini Gistel, 1856

#### 4.21. Notes

The holotype of *Hipporhinus ventricosus* shows the positive imprint of the beetle. The beetle is poorly preserved, but our drawing (Fig. 3D) demonstrates some differences from the illustration in the original description (Piton, 1940: fig. 64). It is clear that this species had no mucro and uncus, it has thickened femora without teeth, a comparatively short rostrum (rather shorter than prothorax), gently narrowing apically and with antennal grooves beginning in apical third, and also larger eyes and elytra with wide punctate striae. The structure of the tibiae in *Hipporhinus ventricosus* makes it possible to suppose that this species can belong to subfamilies Entiminae or Cyclominae Schoenherr, 1826. These subfamilies have the most reliable distinguished characters in the structure of the gonocoxites and styli of the ovipositor (Oberprieler, 2010). The mandibles of Cyclominae have no scar of deciduous process and their prothorax is with postorbital lobes in all large representatives. The mandibular structure is not visible the examined imprint, but its pronotum is without clear postorbital lobes. The imprint of the holotype was described in the genus *Hipporhinus* Schoenherr, 1823 (= *Bronchus* Germar, 1817), although Piton included in this genus the member of different genera, such as *Rhytidoderes* Schoenherr, 1826 (Tropiphorini Marseul, 1863), *Protainophthalmus* Zherikhin, 1992 (Tanymecini Lacordaire, 1863) и *Dryophthorus* Schoenherr, 1825 (Dryophthorini Schoenherr, 1825) (Zherikhin, 1992, 2000). The structure of the prosternum, which is without clear postocular lobes, rostrum narrowing apically, and large body support the attribution of this fossil to the tribe Naupactini, which was known before only from the Eocene Baltic amber (Yunakov and Kirejtshuk, 2011).

Naupactini gen. indet. *ventricosus* (Piton, 1940)

*Hipporhinus ventricosus* Piton, 1940, pp. 198–199, fig. 64. (Fig. 3B and D)

#### 4.22. Type locality and stratum

Menat Basin, Puy-de-Dôme, France. Middle Paleocene; approximately 60–61 Ma. Type locality is situated around the small lake near the village of Menat (46°06' N; 2°54' E).

#### 4.23. Holotype (female)

“R06684” deposited in MNHN. The imprint of the holotype (part) is poorly preserved and shows very obliterated sclerites of the body and some appendages, and also a few large punctures at the elytral base, which are arranged in longitudinal rows. The imprint is entombed in hard rock.

#### 4.24. Addition to description of holotype

Body dark. Rostrum rather short, almost straight, slightly narrowed to apex, about 1.9 times as long as wide in middle, with antennal scrobe in second third, probably with longitudinal carinae. Forehead convex. Eyes rounded, large. Antennae probably inserted in first third of rostrum.

Pronotum probably transverse, about 1.6 times as long as rostrum.

Elytra about 3.5 times as long as pronotum, with weak humeri. Elytron about 3.6 times as long as wide at base, about 2.7 times as long as wide in middle and about 5.1 times as long as wide at apical quarter. Intervals flattened, wide. Striae distinct, with large and sparse punctures.

Procoxal portion of prosternum rather long. Metanepisternum large and visible.

Procoxae located near base of prosternum. Legs long. Femora without teeth. Profemora about 2.5–3.2 times as long as wide in middle. Metafemora about 3.2 times as long as wide in middle. Tibiae elongated, almost straight, without uncus and mucro. Metatibiae about 6.5 times as long as wide in middle.

Body length (without rostrum) – 17.3 mm, rostrum length – 3.6 mm.

## 5. Discussion and conclusions

The beetle paleofauna of Menat is rather rich in number and diversity. The curculionoids dominate absolutely in fossils sorted in the course of current studies (more than half of beetle remains), and they seem to present mostly dendrophilous groups of this superfamily. Besides, among beetles, the members of Buprestidae Leach, 1815, Carabidae Latreille, 1802, Cerambycidae Latreille, 1802, Elateridae Leach, 1815, Chrysomelidae Latreille, 1802, and Staphylinidae Lameere, 1900 were described in a greater number than other groups (Piton, 1940). The current studies showed a considerable representation of Cupedidae Laporte, 1836, consisting of some genera as remains of the Mesozoic fauna (for example, *Mesocupes* Martynov, 1926), although at the same time some close relatives of the modern fauna were represented (at least by species of *Cupes* Fabricius, 1801). Also many specimens of Buprestidae, Cerambycidae, Elateridae, eumolpine-like leaf beetles (Chrysomelidae), Nitidulidae Latreille, 1802, Tenebrionidae and some other arboreal groups are well represented (Balazuc and Descarpentries, 1964; Kirejtshuk et al., 2010, 2016a, 2016b; Nabozhenko and Kirejtshuk, 2014; Piton, 1940; Piton and Théobald, 1937). Eight species of Curculionoidea described from Menat belong to the families Ithyceridae, Brentidae, Attelabidae, and Curculionidae. The representatives of the two first families are described in this paper. “*Phytonomus*” *punctatus* Piton, 1940 was first



described as a member of Curculionidae, but a further analysis of original descriptions and drawings (Piton, 1940: Fig. 65) makes it possible to estimate an adequate position of this species (Kirejtshuk et al., 2016a, 2016b; Legalov, 2013). Unfortunately, the holotype of this species is not yet available for re-examination, although additional specimens recently revealed, including one very similar to what was described by Piton as “*Phytonomus punctatus*”, show that this species indeed is a member of Attelabidae. *Lixus ligniticus* Piton, 1940 certainly belongs to the subfamily Lixinae (Curculionidae). “*Centrinus longipes* Piton, 1940 after its description and drawing (Piton, 1940: Fig. 67) can be regarded as a member of the subfamily Curculioninae, because it has the tibiae without uncus, large mesepimera and abdominal ventrites nearly homonomous in length. “*Rhysosternum punctatolineatum* Piton, 1940 could be a species from Molytinae or Curculioninae and needs further studies of its holotype and new additional specimens.

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