

## Two new fossil soldier beetles from the Baltic amber (Coleoptera: Cantharidae)

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### Taxonomy, new species, paleoentomology, Coleoptera, Cantharidae, Gulf of Gdańsk, Baltic amber

**Abstract.** Two new fossil species of the family Cantharidae from the Baltic amber (Gulf of Gdańsk, Poland): *Lycocerus xenium* sp. nov. and *Podistra (Absidia) jirii* sp. nov. are illustrated and described. *L. xenium* sp. nov. shows a filiform antenna, pronotum not bulged medially and a length of antennomeres II-IV different from the other known species. *P. jirii* sp. nov. shows a small size and a pronotum not thickened in the basal part.

### INTRODUCTION

In this work, I describe two new fossil species of the family Cantharidae Imhoff, 1856 from the Baltic amber, respectively of the genus *Lycocerus* Gorham, 1889 and *Podistra* Motschulsky, 1839. *Lycocerus* was recently found in the Baltic amber with three species (Kazantsev 2018, Fanti & Damgaard 2019), plus one species, as compression, was known for the Miocene deposits of Shandong, Shanwang, Linqu County in China (Zhang 1989, Fanti 2017). The genus is currently composed of more than 300 species (Delkeskamp 1977, Kang et al. 2017), living in the Palaearctic and Oriental Regions (Far East Russia, Japan, Himalaya, China, Korea, Taiwan). They are sometimes attracted by light (Okushima 2005) and are essentially predators, attaching various insects (particularly aphids) and small arthropods on flowers and green leaves, and could be useful for pollination (Okushima 2005, Kang et al. 2017), but sometimes infesting citrus flowers (Noguchi 1938) or they feed on the ear of the wheat (Okano 1944). *Podistra*, on the other hand, is known in the fossil records for a single species embedded in the Baltic amber (Fanti & Damgaard 2018) and for specimens at the generic level (Klebs 1910, Bachofen-Echt 1949, Fanti 2017) plus a species recently described as compression from the Oligocene of Rott, Germany (Fanti & Walker 2019). The genus is currently widespread in the Palaearctic Region (Delkeskamp 1977, Kazantsev 1998, Kazantsev & Brancucci 2007), and with two species also from California and New Mexico in North America (Fender 1972, Delkeskamp 1977, Ramsdale 2002). *Podistra* species are found mostly at high altitudes and are also probably predators of arthropods, integrating the diet with nectar and pollen.

### MATERIALS AND METHODS

The amber pieces from the Gulf of Gdańsk (Poland) were cut, cleaned, and re-polished by Artur Michalski. Pictures were taken by a Canon EOS 4000D photo camera mounted

on a Nikon SMZ1500 microscope with a Plan Apo lens and equipped with a CombineZM focus stacking software. Measurements were taken with a micrometer and with the help of the pixels of photographs. Plates were processed with PhotoImpact Viewer SE software. The specimens are deposited in the Fabrizio Fanti amber collection housed at Piazze (Siena, Italy). The terms follow the relevant literature on the argument, and the species are described in a systematic-alphabetic order.

## RESULTS

**Family Cantharidae Imhoff, 1856**  
**Subfamily Cantharinae Imhoff, 1856**  
**Tribe Cantharini Imhoff, 1856**

**Genus *Lycocerus* Gorham, 1889**

***Lycocerus xenium* sp. nov.**  
(Fig. 1)

**Type horizon.** Middle Eocene (Lutetian) (47.8-41.2 Ma) to late Eocene (Priabonian) (37.8-33.9 Ma).

**Type locality.** Poland, Baltic Sea coast, Gdańsk, Wisła River estuary area (Mikoszewo, Jantar, Stegna, Sztutowo, Katy Rybackie villages).

**Type material.** Holotype (probably female): Baltic amber, deposited in the Fabrizio Fanti amber collection, accession No. BaA04PL.

**Description.** Adult, winged, elongate, slender. Probably female, defined on the basis of the short antennae. Body length: 6.0 mm (the head is partially folded). Dark brown with elytra darker (blackish).

Head transverse, almost completely exposed, slightly wider than pronotum, dorsally slightly convex, densely punctate and pubescent. Eyes relatively large, rounded, inserted in the lateral-upper part of the head. Maxillary palpi 4-segmented, with the last palpomere securiform. Labial palpi 3-segmented with the last palpomere securiform. Antennae 11-segmented, filiform, inserted in the upper part of head, relatively short and not reaching the half of elytra; antennomere I robust and club-shaped, antennomere II about 1.4-1.5 times shorter than antennomere III, antennomere III about 1.3 times shorter than antennomere IV, antennomeres IV-X sub-equal, antennomere XI elongate and rounded at the apex, all antennomeres pubescent.

Pronotum elongate, sub-quadrate, surface flat with pubescence, sides straight, posterior margin straight and slightly bordered, anterior margin slightly convex and sinuous. Scutellar shield very wide basally with pointed apex. Elytra very long, wider than pronotum, parallel-sided, rounded at the apex, densely wrinkled, with uniform and sparse pubescence. Hind wings dark, covered by elytra and only slightly exceeding.

Legs short, densely pubescent; coxae robust; trochanters small and elongate; femora slightly enlarged; tibiae thin, as long as femora or slightly shorter, equipped with spurs; tarsal formula 5-5-5; first tarsomere elongate and robust; second tarsomere about 1.4 times



Fig. 1. *Lycocerus xenium* sp. nov.: Holotype, No. BaA04PL. A: dorso-lateral view; B: ventro-lateral view. Scale bars = 1.0 mm.

shorter than first tarsomere; third tarsomere triangular and slightly lobated; tarsomere IV conspicuously widened, deeply incised; tarsomere V thin, elongate and flat; claws simple with an evident and rounded tooth at the base.

Abdomen not well visible. Male unknown.

**Differential diagnosis.** *Lycocerus dentantennatus* Kazantsev, 2018 differs from the new species by the pronotum conspicuously bulged medially, and by its dentate antennomeres which are instead filiform in *L. xenium* sp. nov. (Kazantsev 2018). *Lycocerus christelae* Kazantsev, 2018 is smaller than *L. xenium* sp. nov. (4.4 mm instead of 6.0 mm) and has a different length of the antennomeres II and III (Kazantsev 2018). Furthermore, *Lycocerus jesperibuchi* Fanti & Damgaard, 2019 has a considerably larger dimensions and a different pronotal shape (Fanti & Damgaard 2019).

**Etymology.** Derived from the Latin noun *xěńńum* = gift. In reference to the gift of the specimen, who kindly made me Artur Robert Michalski (Poland). Specific epithet is to be treated as noun in apposition.

**Syninclusions.** Many botanical remains.

**Remarks.** The amber piece is rectangular shaped measuring 29 x 13 mm. The inclusion is complete but ventrally is strongly covered by a white cotton-like cloud (emulsion). The matrix has various small fractures on the surface.

**Genus *Podistra* Motschulsky, 1839**  
**Subgenus *Absidia* Mulsant, 1862**

***Podistra (Absidia) jirii* sp. nov.**  
(Fig. 2)

**Type horizon.** Middle Eocene (Lutetian) (47.8-41.2 Ma) to late Eocene (Priabonian) (37.8-33.9 Ma).

**Type locality.** Poland, Baltic Sea coast, Gdańsk, Wisła River estuary area (Mikoszewo, Jantar, Stegna, Sztutowo, Katy Rybackie villages).

**Type material.** Holotype (♂): Baltic amber, deposited in the Fabrizio Fanti amber collection, accession No. BaA05PL.

**Description.** Adult, winged, slender. Male, defined on the basis of the long antennae and the last sternite triangular-shaped. Body length: 5.0 mm. Entirely dark brown - blackish.

Head almost completely exposed, short, rounded, equipped with shallow punctation. Eyes large, rounded, inserted in the lateral-upper part of the head. Maxillary palpi 4-segmented, with the last palpomere slightly securiform, extremely elongate, rounded apically. Labial palpi 3-segmented with the last palpomere securiform, short and rounded. Antennae 11-segmented, filiform, inserted in the upper part of the eyes, long, surpassing half of elytra, not reaching the apex, pubescent; antennomere I elongate and robust apically, antennomere

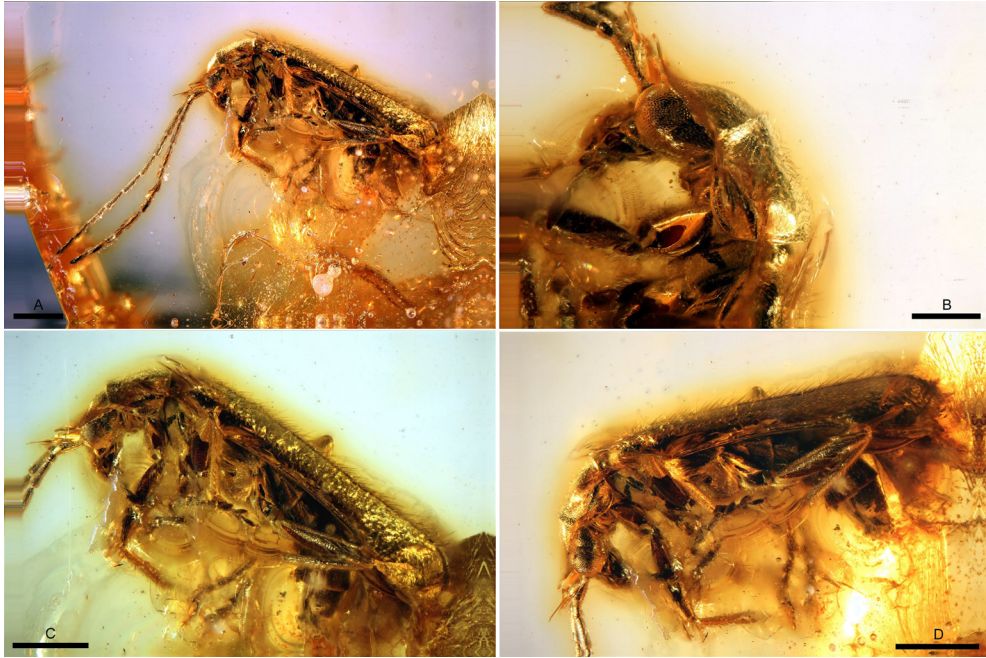


Fig. 2. *Podistra (Absidia) jirii* sp. nov.: Holotype, No. BaA05PL. A: habitus, scale bar = 1.0 mm; B: detail of head and pronotum, scale bar = 0.4 mm; C-D: lateral views, scale bars = 1.0 mm.

II short and globular and about 2.6 times shorter than antennomere III, antennomeres IV-X subequal and slightly longer than antennomere III, antennomere XI filiform and rounded apically.

Pronotum longer than wide, rectangular, slightly narrower than head, surface equipped with setae and slightly concave in the middle, anterior and posterior margins straight and bordered, sides straight, propleura rounded. Scutellar shield triangular. Elytra as wide as pronotum, elongate, covering and slightly surpassing the last abdominal segments, wrinkled, equipped with long setae, parallel-sided, rounded apically. Hind wings completely covered by elytra.

Legs slender, densely pubescent; coxae robust, elongate; trochanters elongate with rounded apex; femora slightly enlarged, curved; tibiae thin, cylindrical, as long as femora; tarsal formula 5-5-5; first tarsomere elongate and robust; second tarsomere shorter than first tarsomere; third tarsomere triangular and slightly bilobed; tarsomere IV conspicuously widened; tarsomere V thin, elongate and flat; claws simple with an evident and rounded tooth at base.

Metasternum sub-quadrate. Sternites transverse and pubescent. Last sternite short, triangular-shaped with pointed apex. Female unknown.

**Differential diagnosis.** *Podistra (Absidia) klovedali* Fanti & Damgaard, 2018, the only other fossil species of the genus in Baltic amber, is easily distinguishable from *Podistra*

(*Absidia*) *jirii* sp. nov. by the thickened basal part of pronotum, and also by the reddish-dark brown coloration and much larger size (Fanti & Damgaard 2018).

**Etymology.** Named after Jiří Háva (Czech Republic), a specialist in Dermestidae.

**Syninclusions.** Very few botanical remains and some gas vesicles (air bubbles).

**Remarks.** The amber piece is quadrate and measures 12 x 13 mm. The inclusion is complete, with emulsion in a side. The matrix has several fractures. The presence of a tooth at the base of claws is typical of the subgenus *Absidia*.

## DISCUSSION

*Podistra* Motschulsky, 1839 and *Lycocerus* Gorham, 1889 are two genera with the habitus and morphological aspect very similar, but while *Podistra* is found at high altitude, *Lycocerus* is widespread in various tropical and flat environments, and therefore the various species obviously have different eco-ethological needs. The major differences between the two genera are found in the pronotal shape and above all in the aedeagus (Kazantsev 2018). The discovery in amber allows some biogeographic considerations and about the age of Baltic amber itself. In fact, the amber seems to have originated in flat forests, transported by the Eridanos River (Overeem et al. 2001), and without particular orogenetic events during the formation period (Sadowski 2017). It could therefore be assumed that the genus *Podistra* in “favorable conditions” can evolve even at lower altitudes and not necessarily in the mountains. *Lycocerus* being currently an Asian genus, as well as the recent Eocene findings (Baltic amber and Insect Limestone in England) of the genus *Themus* Motschulsky, 1858 (Kazantsev 2013, Fanti & Damgaard 2018, Kirejtshuk et al. 2019), may have reached Asia later. Or the Baltic amber is more recent, dating back to the Oligocene when Europe and Asia were no longer divided from the Turgay Strait, as during the Eocene. The other hypothesis is that both *Lycocerus* and *Themus* evolved more anciently than previously known and therefore in the Cretaceous (where Europe and Asia were connected), even if remains so ancient have not yet been found (Fanti & Damgaard 2018). In the final analysis, there is the remote possibility that some small land (archipelagos for example), currently unknown, were present between Europe and Asia during the Eocene, and therefore allowed faunal exchanges.

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