

Three new soldier beetles from Baltic and Rovno amber

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Three new fossil soldier beetles (family Cantharidae) are studied, described and illustrated in the paper. Two new *Cantharis* namely: *Cantharis* (s. str.) *groehni* sp. nov. from Rovno amber and *Cantharis* (*Cyrtomoptila*) *carsteni* sp. nov. from Baltic amber. A new peculiar *Mimoplatycis* from Rovno amber: *Mimoplatycis carstengroehni* sp. nov. characterized by a greater number of visible ventrites, seven instead six.

Keywords: Cantharidae, fossil resin, palaeoentomology, *Cantharis*, *Mimoplatycis*

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INTRODUCTION

The precious resources of amber in the world, allow us to study biogeography, evolution, natural history and environmental changes, it is therefore one of the main windows onto the ecosystems of the past, and becomes fundamental for the study of the planet Earth and for the whole natural sciences. The study of fossil Cantharidae has had a great increase in recent years, with a considerable augment in new species and genera described (Kazantsev 2013; Fanti 2017, 2025).

In the present work, I describe two fossil species of the genus *Cantharis* Linnaeus, 1758 from Rovno and Baltic ambers, genus which has a current distribution in the Holarctic realm and extends into the Oriental region with over 300 species described (Delkeskamp 1977; Kazantsev & Brancucci 2007). Numerous are also the species of this genus described in the fossil stage in Baltic amber, one in Rovno amber and others in the rock deposits, as compressions, of Oligocene of Rott, Germany; the Oligocene of Enspel,

Germany; the Miocene of Öhningen, Germany; and from the Miocene of Radoboj, Croatia (Fanti 2025). I also describe a peculiar new fossil *Mimoplatycis* Kazantsev, 2013 from Rovno amber, with a higher number of ventrites than other similar taxa. *Mimoplatycis* is a genus known only at the fossil stage (Eocene) and currently counts four species in Baltic amber (Kazantsev 2013, 2025; Fanti & Vitali 2017; Parisi & Fanti 2019) and two taxa in Rovno amber (Fanti 2025; Kazantsev 2025).

MATERIALS AND METHODS

The specimens have been re-polished in order to highlight the inclusions and were donated by Jonas Damzen (Vilnius, Lithuania) and Carsten Gröhn (Glinde, Germany) to the Center of Natural History, Hamburg, Germany (Centrum für Naturkunde – CeNak; formerly Geologisch-Paläontologisches Institut und Museum der Universität Hamburg – GPIH). The photographs were taken by Aleksej Damzen (Vilnius, Lithuania) with a Canon 90D

camera with a macro lens (Canon MPE-65 mm). Extended depth of field at high magnifications was achieved by stacking multiple images from a range of focal planes using Helicon Focus v. 6.0.18 software, and the final images were edited to create figures using Adobe Photoshop 7.0. Plates were reprocessed using a PhotoImpact Viewer SE program.

The Baltic amber piece is from Yantarny, Sambian Peninsula, Kaliningrad region, Russia. This amber horizon was formed during the Lutetian-Priabonian (Weitschat & Wichard 2010; Bukejs et al. 2019). The Rovno amber pieces are from Ukraine, Rivne Oblast (Rovno province). This horizon was formed during the Upper Eocene: Priabonian stage: 33.9–37.71 Mya (Perkovsky et al. 2003, 2010).

RESULTS

Order Coleoptera Linnaeus, 1758
Superfamily Elateroidea Leach, 1815
Family Cantharidae Imhoff, 1856
Subfamily Cantharinae Imhoff, 1856
Tribe Cantharini Imhoff, 1856
Genus *Cantharis* Linnaeus, 1758
Subgenus *Cantharis* Linnaeus, 1758

***Cantharis (s. str.) groehni* sp. nov.**
 (Fig. 1)

Holotype. Female, in Rovno amber, deposited under accession number GPIH5237, coll. Carsten Gröhn CCGG8718 (ex coll. Jonas Damzen: JDC-13770R).

Type locality. Ukraine, Rivne Oblast (Rovno province), mine unknown.

Type horizon. Upper Eocene: Priabonian stage (33.9–37.71 Mya).

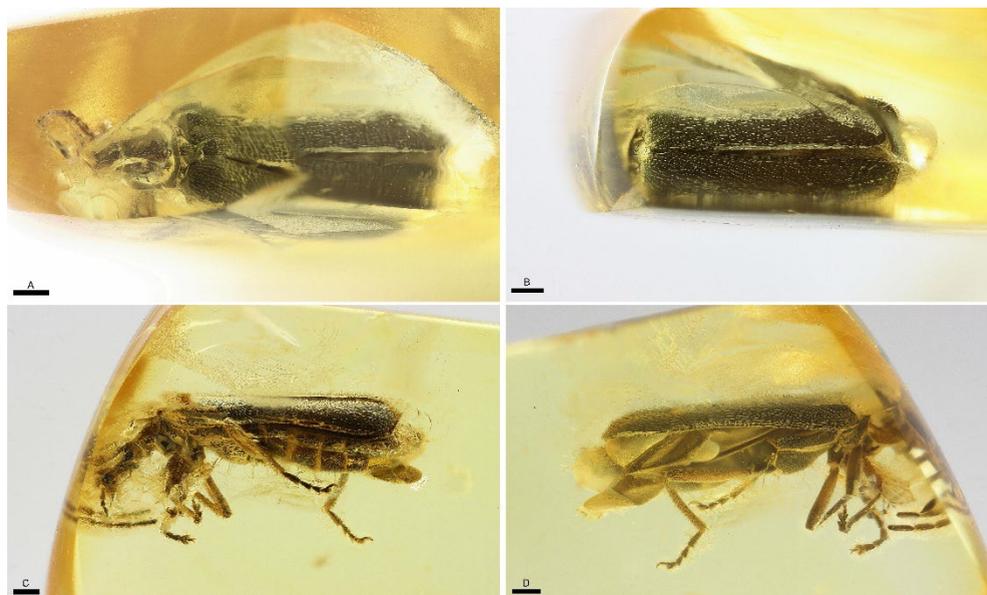


Fig. 1. *Cantharis (Cantharis) groehni* sp. nov. holotype, in Rovno amber. A: Holotype, dorsal view, bar = 0.5 mm; B: Holotype, detail of elytra and scutellar shield, bar = 0.5 mm; C: Holotype, lateral view, scale bar = 0.5 mm; D: Holotype, lateral view, scale bar = 0.5 mm.

Differential diagnosis. The only fossil *Cantharis* from Rovno amber: *Cantharis michaeli* Fanti & M. G. Pankowski, 2023 differs from *C. groehni* **sp. nov.** for the bigger size: 9.0 mm, and for the pronotum and antennomeres longer (Fanti & Pankowski 2023). The most similar species to *C. groehni* **sp. nov.** is *Cantharis dougi* Kupryjanowicz & Fanti, 2019 from Baltic amber which has a straight pronotum at posterior margin, scutellum more triangular and antennomeres longer, especially the antennomeres V-VIII which are longer than scape (Kupryjanowicz & Fanti 2019).

Other similar taxa from Baltic amber: *Cantharis hoffeinsorum* Kazantsev, 2018 is noticeably smaller (3.3. mm) with pronotum rounded at sides, and *Cantharis hanswernerii* Kazantsev, 2018 has pronotum and antennomeres longer (Kazantsev 2018).

Description. Adult, winged, slender. Female defined on the basis of short antennae and last sternite apically rounded. Body length: about 5.7-6.0 mm (head is folded). Entirely dark brown.

Head almost completely exposed, transverse, almost smooth, equipped with short setae and without punctation. Eyes large, very prominent, convex, rounded, inserted in lateral-upper part of head. Mandibles falciform, elongated. Maxillary palpi 4-segmented, with last palpomere securiform. Labial palpi 3-segmented, with last palpomere securiform. Antennae filiform, 11-segmented, very short, almost reaching half of elytra, all antennomeres except scape and antennomere XI rather short;; antennomere I elongated, slightly club-shaped; antennomere II short, rather robust, about 2.6–2.7 times shorter than antennomere I; antennomere III very slightly longer than antennomere II; antennomeres IV–X elongated, sub-equal, slightly longer than previous one (antennomeres V–VIII shorter than scape); antennomere XI

elongated, rounded at apex; all antennomeres equipped with short setae. Pronotum transverse, not elongated, slightly wider than head, surface almost flat with very shallow punctation and some long setae, sides straight, anterior margin straight and slightly bordered, posterior margin not particularly straight (slightly narrower near the sides) and slightly bordered, corners rounded. Scutellar shield triangular shaped, rather large at base, rounded at apex. Elytra long, noticeably wider than pronotum, robust and large, smooth, covered with several setae, parallel-sided, rounded at apexes. Metathoracic wings infusate, exceeding elytra and almost reaching last abdominal segments. Legs rather robust, strongly pubescent; coxae elongated and stout; trochanters short, with rounded apex; femora enlarged, almost straight; tibiae cylindrical and thin, equipped with an apical spur, slightly shorter than femora. Tarsi 5-segmented, strongly pubescent; tarsomere I elongated, rather robust; tarsomere II shorter than tarsomere I; tarsomere III triangular shaped, shorter than second; tarsomere IV strongly bilobed with lobes rounded at apex; tarsomere V very long, thin, flat, curved; claws simple with a very small and obtuse basal tooth. Metasternum strongly pubescent, with sinuous and irregular posterior margin. Sternites transverse, strongly pubescent, with shallow punctation. Last tergite elongated, rounded; last sternite elongated, apically rounded.

Etymology. Species named in honor of Gröhn (Carsten Gröhn - Glinde, Germany), a great Baltic amber specialist.

Syninclusions. A few detritus, stellate hairs.

Systematic placement. The securiform last maxillary palpomere, filiform 11-segmented antennae, the pronotum without lateral lobes, third bilobed tarsomere, and the claws simple with a basal obtuse and small tooth reliably place the new species in the genus

Cantharis and its nominotypical subgenus (Brancucci 1980; Constantin 2014).

amber. The male of the new species is unknown.

Remarks. The green-yellowish amber piece measures approximately 30 x 10 x 6 mm. The inclusion is complete, with part of the antennae very close to the surface of the

Subgenus *Cyrtomoptila* Motschulsky, 1860

***Cantharis (Cyrtomoptila) carsteni* sp. nov.**
(Figs. 2–3)



Fig. 2. *Cantharis (Cyrtomoptila) carsteni* sp. nov. holotype, in Baltic amber. A: Holotype, dorso-lateral view, bar = 0.5 mm; B: Holotype, ventral view, bar = 0.5 mm.



Fig. 3. *Cantharis (Cyrtomoptila) carsteni* sp. nov. holotype, in Baltic amber. A: Holotype, macro shot of dorsal view, bar = 0.5 mm; B: Holotype, macro shot of ventral view, bar = 0.5 mm; C: Holotype, detail of the apex of elytra and last tergites, bar = 0.5 mm; D: Holotype, detail of last sternites, bar = 0.1 mm.

Holotype. Female, in Baltic amber, deposited under accession number GPIH5236, coll. Carsten Gröhn CCGG8717 (ex coll. Jonas Damzen: JDC-13757).

Type locality. Russia, Kaliningrad Region, Sambian Peninsula, Yantarny mine.

Type horizon. Middle Eocene: Bartonian-Priabonian (41.0–33.9 Mya).

Differential diagnosis. Currently, only two species of the subgenus *Cyrtomoptila* are known, both from Baltic amber: *Cantharis mikkelsenorum* Fanti & Damgaard, 2018 and *Cantharis sucinokotejai* (Kuška, 1996).

C. mikkelsenorum differs from *C. carsteni* sp. nov. for its significantly larger size (10.5 mm) and in its pronotum with ripples in the middle and sinuous lateral margins (Fanti & Damgaard 2018). *Cantharis sucinokotejai* differs from *C. carsteni* sp. nov. for its larger size (6 mm), by pronotum almost square

with posterior corners poorly sharpened, and by different length of antennomeres (Kuška 1996).

Description. Adult, winged, slender. Female defined on the visibility of ovopositor. Body length: about 4.1 mm. Entirely dark brown.

Head almost completely exposed, elongated, almost smooth, equipped with short setae and with punctation. Eyes large, very prominent, convex, rounded, inserted in lateral-upper part of head. Mandibles falciform, elongated, basally enlarged, without denticles. Maxillary palpi 4-segmented, with last palpomere securiform. Labial palpi 3-segmented, with last palpomere securiform. Antennae filiform, 11-segmented, short, surpassing half of elytra, not reaching the apex of elytra; antennomere I elongated, very robust, club-shaped; antennomere II short, almost globular, about 3.2 times shorter than scape;

antennomeres III–VI very long, robust, sub-equal, about 2.5 times longer than second; antennomeres VII–X sub-equal, slightly shorter than previous ones; antennomere XI elongated, rounded at apex; all antennomeres equipped with long setae. Pronotum elongated, subsquared with posterior margin slightly extruded and strongly bordered, wider than head, surface smooth and not completely flat equipped with some setae, sides straight and bordered, anterior margin very feebly rounded and rather bordered, corners rounded. Scutellar shield triangular shaped, very large at base, rounded at apex. Elytra long, wider than pronotum, robust and large, rather wrinkled, covered with several long setae, parallel-sided, rounded at apexes. Metathoracic wings infuscate, approximately as long as elytra. Legs long, rather robust, pubescent; coxae elongated and stout; trochanters short, robust, with rounded apex; femora enlarged, almost straight; tibiae cylindrical, thin, equipped apically with a short spur, pro- and mesotibiae as long as pro- and mesofemora, metatibiae longer than metafemora. Tarsi 5-segmented, pubescent; tarsomere I robust, elongated; tarsomere II shorter than tarsomere I; tarsomere III shorter than second, robust, triangular shaped; tarsomere IV bilobed with lobes robust and rounded at apex; tarsomere V thin, elongated, curved; claws simple without tooth. Metasternum pubescent, without punctuation, with posterior margin enlarged in the middle. Sternites transverse, feebly pubescent, with shallow punctuation. Last tergite rounded; last sternite large, with the apical margin with a small concavity in the middle, ovopositor visible with lobes thin, larger at base.

Etymology. Species named in honor of Carsten (Carsten Gröhn - Glinde, Germany), a great Baltic amber specialist.

Syninclusions. A few detritus, stellate hairs, air bubbles.

Systematic placement. The securiform last maxillary palpomere, filiform 11-segmented antennae, the pronotum without lateral lobes, third bilobed tarsomere, and the claws simple reliably place the new species in the genus *Cantharis* (Brancucci 1980; Constantin 2014). Based on the claws without basal tooth, the new species is provisionally inserted in the subgenus *Cyrtomoptila* (Constantin 2014).

Remarks. The yellowish amber piece measures approximately 15 x 6 x 3 mm. The inclusion is complete. The male of the new species is unknown.

Subfamily Malthininae Kiesenwetter, 1852

Tribe Mimoplatycini Kazantsev, 2013

Genus *Mimoplatycis* Kazantsev, 2013

***Mimoplatycis carstengroehni* sp. nov.**
(Fig. 4)

Holotype. Male, in Rovno amber, deposited under accession number GPIH5238, coll. Carsten Gröhn CCGG8719 (ex coll. Jonas Damzen: JDC-13919R).

Type locality. Ukraine, Rivne Oblast (Rovno province), mine unknown.

Type horizon. Upper Eocene: Priabonian stage (33.9–37.71 Mya).

Differential diagnosis. Four *Mimoplatycis* are known from Baltic amber, and two from Rovno amber (Fanti 2025; Kazantsev 2025). The new species are distinguished from all by the seven visible ventrites, which are also very narrow.

Description. Adult, winged, slender. Male defined on the basis of the visible aedeagus (partially extruded). Body length: about 4.0 mm. Dark brown with blackish pronotum and head.



Fig. 4. *Mimoplatycis carstengroehni* sp. nov. holotype, in Rovno amber. A: Holotype, dorsal view, bar = 1.0 mm; B: Holotype, dorsal view, bar = 1.0 mm; C: Holotype, macro shot of last abdominal segments and aedeagus, bar = 0.5 mm.

Head small, semi-exposed, slightly triangular posteriorly, wrinkled with evident punctuation in relief, equipped with short setae. Eyes large, prominent, convex, rounded, inserted in lateral-upper part of head. Mandibles falciform, elongated, rather thin, without teeth. Maxillary palpi 4-segmented, with last palpomere robust, elongated, semi-globular and distally pointed. Labial palpi 3-segmented, with last palpomere globular and distally pointed. Antennae filiform, 11-segmented, rather short, slightly surpassing half of elytra; antennomere I elongated, rather robust, strongly club-shaped; antennomere II robust, elongated, approximately about 2.3 times shorter than antennomere I; antennomere III robust, slightly longer than antennomere II; antennomeres IV-IX elongated, sub-equal, longer than previous one; antennomere X slightly shorter than previous ones; antennomere XI elongated, slightly shorter than previous one, rounded at apex; all antennomeres equipped with short and long setae. Pronotum transverse, wider than head, with conspicuous H-shaped raised, very slightly open anteriorly and posteriorly and interrupted in the middle by two transverse carinae areole. Scutellum triangular shaped. Elytra long, wider than pronotum, slightly wrinkled, covered with several short setae, parallel-sided, rounded at apexes. Metathoracic wings infuscate, almost completely covered by elytra (very slightly exceeding elytra). Legs rather robust, pubescent; coxae elongated, curved and stout; trochanters rounded, robust, with rounded apex; femora enlarged, almost straight; tibiae cylindrical and thin, pro- and mesotibiae approximately as long as pro- and mesofemora; metatibiae very slightly longer than metafemora. Tarsi 5-segmented, pubescent; tarsomere I elongated; tarsomere II shorter than tarsomere I; tarsomere III slightly shorter than second; tarsomere IV bilobed with long lobes rounded at apex; tarsomere V robust, curved; claws simple without tooth. Metasternum with posterior

margin expanded in the middle. Sternites transverse and pubescent, with the first two noticeably larger. Last sternite very wide, squared, with sides and posterior margin straight, equipped with very long setae on all the surface. Aedeagus almost completely extruded, wide, huge, more wide than last sternite, dorsal shield slightly narrower and elongated.

Etymology. Species named in honor of Carsten Gröhn (Glinde, Germany), a great Baltic amber specialist.

Syninclusions. Detritus, botanical remains, air bubbles, stellate hairs.

Systematic placement. The long elytra, the last maxillary palpomere globular and distally pointed, the last abdominal segments unmodified, and the conspicuously carinate pronotum place this species in the genus *Mimoplatycis* (Kazantsev 2013, 2025). However, the presence of seven visible ventrites makes this species particular, in fact the other *Mymoplatycis* males have six ventrites (Kazantsev 2013).

Remarks. The green-yellowish amber piece, half moon shaped, measures approximately 39 x 22 x 9 mm. The inclusion is complete. The female of the new species is unknown.

DISCUSSION

Each fossil Cantharidae such as the two new *Cantharis* described here can shed light on many biological aspects. In particular, Mimoplatycini Kazantsev, 2013 (Malthininae) are a group of interesting species for the evolution studies of these organisms and therefore on bioevolutionary considerations in general. Originally the tribe composed only of the Eocene genus *Mimoplatycis* Kazantsev, 2013 was characterized by six males ventrites

(Kazantsev 2013) versus seven or eight ventrites in other cantharids (Brancucci 1980), and by noticeably carinate pronotum. However, this last feature, or somewhat similarly structured pronotum, according to Kazantsev himself (2025), may be found in the living *Malthinus* (*Indomalthinus*) (Malthininae Malthinini). The subsequent finding of *Mimoplatycis carstengroehni* sp. nov. (Malthininae Mimoplatycini) with seven visible ventrites allows us to make some important considerations. That is, the characteristics of a species and therefore also of a genus do not arrive and evolve suddenly on a large group of taxa and therefore we can find especially at the evolutionary beginning of the taxon in question, many intermediate forms, and this would be the case of *Mimoplatycis carstengroehni* sp. nov.

Kazantsev et al. (2025) instead, regarding the Cacomorphocerini (Cantharinae), evidently do not accept the possibility of intermediate forms with the Cantharini. The possibility of intermediate forms between two similar taxa has been known for hundreds of years in many other orders. Therefore, according to what Kazantsev et al. (2025) indicate, but not proposed, even the Mimoplatycini would be unequivocally synonymous with Malthinini.

It is evident that numerous other organisms and numerous other studies are necessary before addressing such complex issues and synonymizing for reasons of prestige.

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