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SHORT COMMUNICATION

A new species of *Platypelochares* from Baltic amber (Coleoptera: Limnichidae)

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Abstract. We describe a new species of Limnichidae (Coleoptera) from Eocene Baltic amber, *Platypelochares electricus* sp. nov. The species belongs to the extant genus *Platypelochares* Champion, 1923, with six species distributed in the Oriental Region, characterised by an almost hemispherical shape, lateral articulation of the meso- and metatarsi, and presence of excavations on the hypomera. *Platypelochares electricus* sp. nov. can be separated from the other species of the genus mainly by the longer extension of the row of tubercles on the pronotum and the punctation of the elytra and metacoxa.

Key words. Coleoptera, Limnichidae, *Platypelochares*, new species, Eocene amber, Oriental Region.

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Introduction

Limnichidae are a relatively small family of Byrrhoidea (Coleoptera), with ca. 400 described species in 37 genera (Hernando & Ribera 2016). They have a world-wide distribution with the exception of alpine and polar areas, and they are absent (or unknown) from many oceanic islands. The ecology of most species is largely unknown, but usually they seem to be only loosely linked to water, sometimes living on streamside vegetation or wood (Ribera & Hernando 1999, Lawrence & Ślipiński 2013). Nowadays most of the diversity of this group occurs in tropical regions.

There is only one species described from Baltic amber, *Palaeoersachus bicarinatus* Pütz, Hernando & Ribera, 2004 (Pütz et al. 2004), although other specimens have also been recorded from Baltic (as "*Limnichus*", Berendt 1845: 56, Klebs 1910, Larsson 1978) and Dominican amber (as "Limnichidae", Poinar 1992: 285).

Here we describe a second species of Limnichidae from Baltic amber, belonging to the extant genus *Platypelochares* Champion, 1923. The genus *Platypelochares* currently has six species with an Oriental distribution (Ribera & Hernando 1999, Yoshitomi 2011) and is characterized mainly by its hemispherical body shape, the lateral (not terminal) articulation of the meso- and metatarsi to the tibiae, and the presence of a fossa on the hypomeron, usually covered with a whitish substance (Ribera & Hernando 1999, Spangler 1999). Some species have also a row of small tubercles on the pronotum, although this character is shared with other genera of Limnichidae (e.g. *Phalachricus* Sharp, 1902, Ribera & Hernando 1999, Hernando & Ribera 2003).

Materials and methods

The amber piece was obtained as a donation from Christel & Hans Hoffeins on 23rd March 2017. The material was polished manually in the Amber Laboratory of the Museum of Amber Inclusions (University of Gdańsk), with emery papers with different grain sizes and finally lustrated with polishing powder. The specimen was examined and photographed with a Leica M205A stereomicroscope with digital camera Leica DM6000 attached and working under Leica Application Suite LAS 3.7. The amber piece with the type specimen is deposited in the Museum of Amber Inclusions at the University of Gdańsk (MAIG).

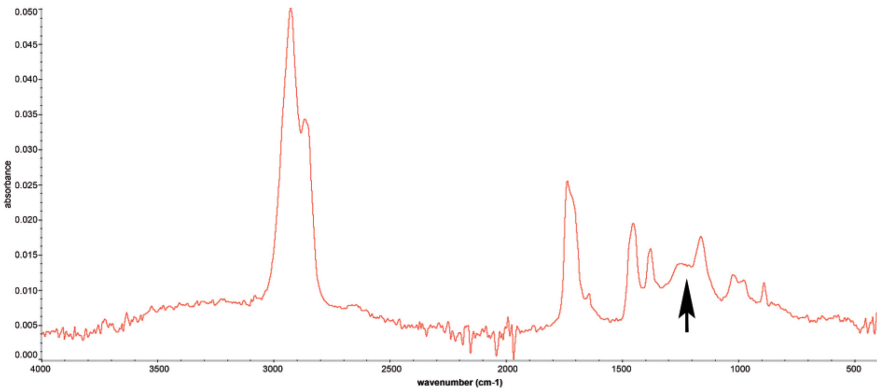


Fig. 1. Fourier transformed infrared spectra (FT-IR) of the amber piece. Note the "Baltic shoulder" between 1190–1280 cm^{-1} (arrow).

For documentation of the amber sample designated as type material and confirmation of its origin (Szwedo & Stroiński 2017), the Fourier Transformed Infrared Spectra (FT-IR) were obtained in the Laboratory of the International Amber Association, Gdańsk, Poland with a Nicolet iS10 Spectrometer with an ATR (Attenuated Total Reflectance) accessory. Reference curve numbers in the collection archives as registration number of the specimen, with suffix 'IR'.

Taxonomy

Platypelochares Champion, 1923

Platypelochares Champion, 1923: 272, Figs 5, 5a.
Wooldridgeus Spangler, 1999: 181, Figs 1-32.

Type species. *Platypelochares trifidus* Champion, 1923, by original designation.

Platypelochares electricus sp. nov.

(Figs 2–7)

Type horizon. Middle Eocene (Lutetian).
Type locality. Baltic amber (secondary deposit, Gulf of Gdańsk area). The obtained FT-IR spectra are typical of Baltic amber, with the so called "Baltic shoulder" situated between 1190–1280 cm^{-1}, and flanked by a strong absorbance peak at 1170 cm^{-1} (Kosmowska-Ceranowicz 2015) (Fig. 1).

Type material. Holotype (unknown sex): Museum of Amber Inclusions, University of Gdańsk, ref. MAIG 5948. Reference IR curves No. MAIG 5948IR (Fig. 2) and deposited in MAIG. Rectangular piece of clear amber, 12.0 × 6.4 × 3.0 mm, including the specimen of *Platypelochares electricus* sp. nov. plus one female specimen of Diptera: Ceratopogonidae: *Brachypogon* (*Brachypogon*) sp. (R. Szadziewski, personal communication, 2018) and one larva of Hemiptera (Coccoidea) (Fig. 2). Venter clearly visible, of the dorsum only the impression in the amber is clearly visible. All legs are in their resting position (folded and inserted in the excavations of thorax and abdomen, see below) except the left middle leg, which is partially extended.

Description. Length 2.0 mm (measured along the ventral side), maximum width 1.4 mm. General shape roughly hemispherical, with posterior half slightly elongated (Figs 2, 3).

Head retracted in prothorax, only frons visible (Fig. 3). With a sharp carina bordering upper margin of eyes and clypeus, which is not visible. Antennae folded, not clearly visible.

Pronotum with a regular row of small tubercles in anterior part, extending laterally over the flattened lateral areas (Fig. 4). Hypomera with a fossa covered with a white undifferentiated substance (Figs 3, 5).

Elytral surface smooth and shiny, with a fine microreticulation, difficult to observe (Fig. 6). Elytral pubescence perfectly preserved, all pores with setae (Fig. 6). Margins explanate, visible from below (Fig. 3). Apex of elytra with a small apical semicircular excavation, apparently not protruding in middle. Epipleura with punctation coarser and denser than on rest of ventral surface (Fig. 3).

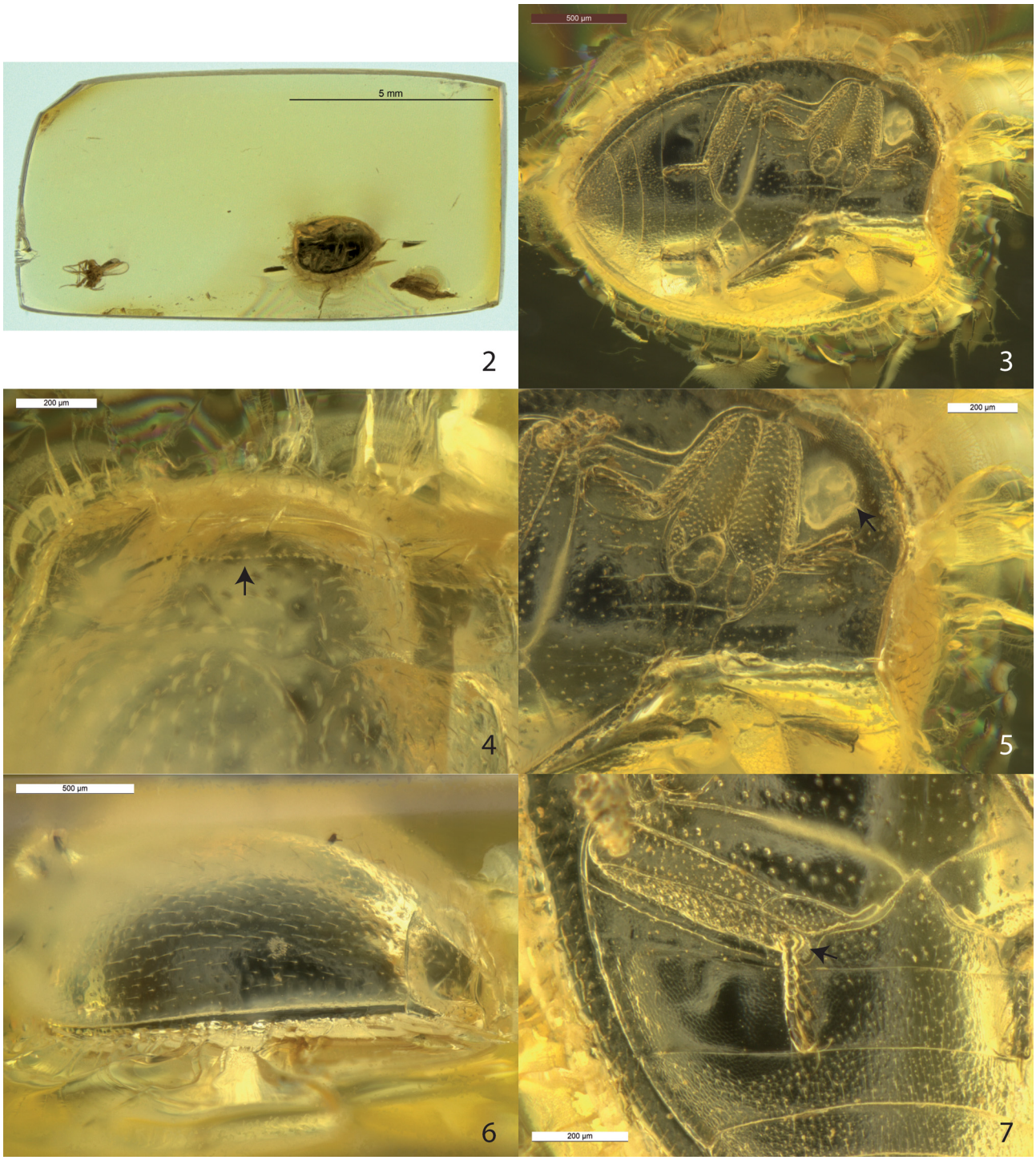
Ventral surface with double punctation: sparse large setiferous punctures, especially on metaventrite, and finer, equally sparse punctures (Fig. 3). Surface of abdominal ventrites with rough punctation (Fig. 7). Lateral margins of 2nd visible sternite glabrous and smooth, with a fine microreticulation, with excavations for reception of metatarsi (Fig. 7). Last abdominal ventrite with an apical tuff of longer setae (Fig. 3).

Ventral surface of trochanters and femora with strong, sparse punctation. Ventral surface of tibiae with a denser, coarser punctation, with setae. Articulation of meso- and metatarsi with tibia lateral, not terminal. Underside of tarsi with long, stiff setae (Figs 5, 7).

Comparative notes. The presence of a row of tubercles on the pronotum places the new species within the *P. trifidus* group sensu Ribera & Hernando (1999). Within this group, it can be separated from other species by the length of the row of tubercles, being longer than in *P. latimargo* Champion, 1923 and *P. periculosissimus* Ribera & Hernando, 1999, but of similar extension to *P. chinensis* Yoshitomi, 2011. The body outline in dorsal view is also more similar to *P. chinensis* (Yoshitomi 2011), with the elytra slightly acuminate, not almost perfectly circular as in *P. latimargo* or *P. periculossisimus*. The elytral reticulation of *P. electricus* sp. nov. is, however, less marked than in *P. chinensis*, and the elytral pubescence is more sparse. The ventral punctation of *P. electricus* sp. nov. is also stronger and less dense than in all other species of the group.
Etymology. From the Latin *electrum* (= amber), adjective in nominative singular.

Discussion

The two presumed synapomorphies of the genus *Platypelochares* are clearly visible in the studied specimen: lateral insertion of the middle and mesotarsi, and presence of a setiferous excavation on the hypomera (Ribera & Hernando 1999, Spangler 1999; Figs 5, 7). Other diagnostic characters of the genus are also present, such as



Figs 2–7. Amber inclusion of *Platypelochares electricus* sp. nov. 2 – amber piece with the studied specimen. 3–7 – morphological details of *P. electricus*: 3 – ventral view; 4 – detail of the tubercle row on the pronotum (indicated by an arrow); 5 – detail of the ventral side of prosternum and right hypomeron, with the excavation (indicated by an arrow); 6 – lateral view; 7 – metacoxa and first four abdominal ventrites (arrow – lateral articulation of the tarsi).

the almost hemispherical body shape, explanate sides of elytra and very transverse hypomeral ridge. The presence of tubercles, although not exclusive, is also a defining characteristic of some species of the genus. According to the external morphology the specimen fits perfectly within the morphological range of the extant species of *Platypelochares*, although it is distinct enough to warrant the description of a new species. The amber piece in which *P. electricus* sp. nov. is included dates from the Middle Eocene (Lutetian, 47.8–41.2 Ma, Szwedo & Drohojowska 2016), so, together with *Palaeoersachus bicarinatus*, also from the Gdańsk bay area, they should be considered the oldest known fossil Limnichidae.

The recognition of species in extant genera among the fossil specimens in Baltic amber is not exceptional, as more than half of the genera with species in European Eocene amber are still extant (229, ca. 54%, Alekseev 2017). Similarly, most of the genera with extant species are currently

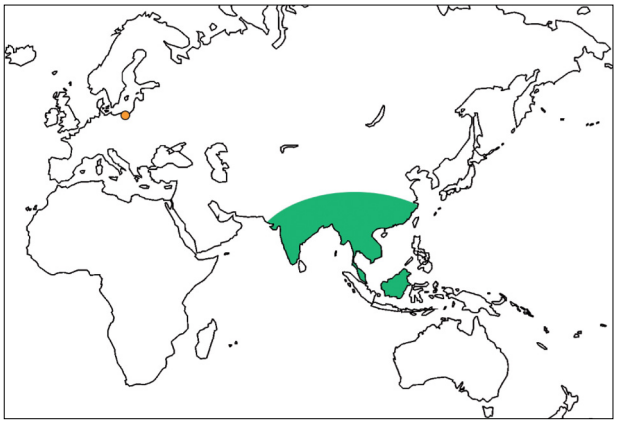


Fig. 8. Known distribution of the extant species of *Platypelochares* (green) and the location of the amber deposit (orange).

absent from Europe (ca 60%, Alekseev 2017). Of these, ten genera have a Palaearctic-Oriental distribution, and only three are currently exclusively found in the Oriental Region (*Balistica* Motschulsky, 1861, Eucnemidae; *Japonopsimus* Matsushita, 1935, Cerambycidae; *Anisodera* Chevrolat, 1836, Chrysomelidae; Alekseev 2017). The pattern displayed by *Platypelochares* (Fig. 8), although rare (three out of 299), is thus not unique, and can most likely be explained by the climatic conditions in north-central Europe during the late Eocene, which was much warmer and more humid than at present (Zachos et al. 2001, Alekseev 2017). The so called "Baltic amber forests" were a very diverse ecosystem spreading over a vast area of Northern Europe during the Eocene (Wolfe et al. 2009, Szwedo 2012). There are still many open questions about the structure of amber forests (Erichson & Weitschat 2008, Weitschat & Wichard 2010), as modern representatives of arthropods found as amber inclusions live in a wide variety of habitats, from dry to wet or lowland to montane (Gröhn 2015). Some extant species of *Platypelochares* are known to be good fliers, frequently collected in light traps, and their precise microhabitat is poorly known (Hernando & Ribera 1999).

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