

Two fossil species of Petaliini White (Coleoptera: Ptinidae: Dorcatominae) from Eocene Baltic amber

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Two fossil species of the tribe Petaliini tentatively assigned to the extant American genus *Petalium* LeConte, *P. bruteno* sp. nov. and *P. widewuto* sp. nov., are described from Baltic amber. The data illustrates and indicates the presence of the tribe in the amberiferous forests that once occupied the territories of the eastern Baltic region and thus in western Palaearctic during the Eocene.

Key words: palaeontology, Coleoptera, Cenozoic, Tertiary, fossil resin

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INTRODUCTION

The family Ptinidae is represented (as of 16 April 2021) by 45 described species from Baltic amber (Bukejs & Alekseev, 2015, Alekseev & Bukejs, 2019, Bukejs et al. 2017, 2018, Háva & Zahradník, 2020a, 2020b etc.). Only two representatives of the subfamily Dorcatominae, *Stagetus arturi* Háva & Zahradník, 2020 and *Calymmaderus ambericus* Háva & Zahradník, 2020 have been described from this *Lagerstätte* (Háva & Zahradník, 2020a, 2020b). The supposed generic assemblage of dorcatomine beetles in Eocene amberiferous forests of Fennosarmatia is more diverse (e.g. Klebs 1910), but the exact systematical placement of the listed fossils is not clear because the absence of illustrations and descriptions for each report. Additionally, the unequivocal attribution of the inclusions to the

modern systematic supraspecific taxa is not always possible in general. The main goal of the current paper is to add and to interpret the available at the moment information concerning the *Petalium*-like inclusions in Baltic amber.

Few fossil records for the genus *Petalium* LeConte have been published but none extinct species was formally described. The genus was documented in Eocene Baltic amber by Alekseev (2014) for the first time. The specimen from private collection of Christel and Hans-Werner Hoffeins under No. 406-3 [CCHH] was determined as "*Petalium*" but not described because "tucked appendages". Another known for us *Petalium*-like specimen is deposited in the private collection of the first author under No AWI-044 [CVIA], but it is deformed, compressed, coaled due to thermal processing in autoclave,

making the further morphological studies difficult and dubious. The original report of “*Rhadine*” within the family “Anobiidae” (12 specimens in the old Königsberg amber collection) can be found in the paper of Richard Klebs (1910). This information was later cited by Spahr (1981). Possible, that mention of *Rhadine* Baudi di Selve, 1873 should really concern *Petalium* LeConte, 1861 in modern sense. However, it is not excluded, this mention concerns other six extant genera of the tribe e.g. in *Synanobium* Schilsky, 1898 or another (see the list in Zahradník & Háva, 2014)

The tribe Petaliini according to comprehensive catalogue of Zahradník & Háva (2014) is most diverse in Afrotropical Region (6 genera in total, 5 of them endemic). The group is represented by one genus (*Petalium*) in the New World and one genus (*Synanobium*) inhabits Palaearctic, Afrotropical and Oriental Regions. The single representative of the tribe, *Synanobium parmatum* (Baudi di Selve, 1874), can be encountered in the Eastern Mediterranean region and Northern Africa of the present-day Western Palaearctic.

In the current paper, two species tentatively assigned to the genus *Petalium* LeConte, namely *P. bruteno* sp. nov. and *P. widewuto* sp. nov. are described from Baltic amber. Thereby, the extinct representatives of this genus are described for the first time and occurrence of the American genus in European Eocene is hypothesized.

MATERIAL AND METHODS

The material examined is deposited in the collection of the Museum of Amber Inclusions, University of Gdańsk (Poland) [MAIG] and in the Private Entomological Laboratory and Collection, Unetice u Prahu, Prague-West, Czech Republic [JHAC]. The amber pieces were polished by hand, allowing improved views of the included specimens, and was not subjected to any supplementary fixation

Observation of the studied beetle specimens was made using a Nikon SMZ 745T stereomicroscope.

The measurements were made using an ocular micrometer in a stereomicroscope. The photographs of specimens were taken using a Canon 70D camera with a macro lens (Canon MPE-65 mm). Extended depth of field at high magnifications was achieved by combining multiple images from a range of focal planes using Helicon Focus v. 6.0.18 software, and the resulting images were edited to create figures using Adobe Photoshop CS5.

The following references were used for the generic attribution and comparison with recent and fossil taxa: Español (1966, 1968), Ford (1973), White (1982), Logvinovskij (1985), Arango & Young (2012), Español & Viñolas (1996), Háva & Zahradník (2020a, 2020b).

SYSTEMATIC PALEONTOLOGY

Family Ptinidae Latreille, 1802

Subfamily Dorcatominae C. G. Thomson, 1859

Tribe Petaliini White, 1982

Genus *Petalium* LeConte, 1861

Note. The specimens under study were assigned to the genus *Petalium* within the tribe Petaliini of the subfamily Dorcatominae based on a combination of the following external morphological characters: (1) first abdominal ventrite with excavations and metathorax with grooves for reception of legs, (2) metathoracic ventrite produced anteriorly into a very characteristic broad rounded lobe, concealing the mandibles when body is retracted, and (3) second abdominal ventrite subequal to combined length of ventrites 3–4. The fossils under study differ from the geographically close genus *Synanobium* Schilsky, 1898 (with the southern Palaearctic distribution) in absence of distinct horseshoe-form impression on the pronotum and alternate in form antennomeres of funicle. Additionally, specimens differ from *Metapetalium* Español, 1970 in inconspicuous pubescence. The habitus and additional visible characters (elytral striation, pronotal form, visible distal part of antenna) led us to conclusion to place the specimens into the genus *Petalium*. The non-visible on the specimens and

not studied basal part of antennae, palpa and genitalia make our assignment tentative.

***Petalium bruteno* sp. nov.**

(Figs. 1–2)

Type material. Holotype: collection number “6781” [MAIG] (ex. coll. Jonas Damzen JDC 7645); adult, sex unknown. A complete beetle included in a transparent, yellow amber piece with approximate dimensions of 24 mm × 18 mm and a maximum thickness of 5 mm; preserved without supplementary fixation. Syninclusions: few stellate fagaceous trichomes.

Paratype: collection number “6782” [MAIG] (ex. coll. Jonas Damzen JDC 9805); adult, sex unknown. A complete beetle with partially exposed metathoracic wings included in a transparent, yellow amber piece with approximate dimensions of 51 mm × 22 mm and a maximum thickness of 9 mm; preserved without supplementary fixation. Syninclusions: two Brachycera (Diptera) apicomens, and few small gas vesicles.

Paratype: collection number “PET01” [JHAC]; adult, sex unknown. A complete beetle included in a transparent, yellow amber piece with approximate dimensions of 40 mm × 18 mm and a maximum thickness of 9 mm; preserved without supplementary fixation. Syninclusions: organic small residues of soil and plants.

Type stratum. Mid-late Eocene, 48–34 Ma (Sadowski et al. 2017, 2020; Seyfullah et al. 2018; Bukejs et al. 2019; Kasiński et al. 2020).

Type locality. Baltic Sea coast, Yantarny settlement (formerly Palmnicken), Sambia (Samland) Peninsula, the Kaliningrad Region, Russia.

Description. Holotype JDC 7645. Measurements: total body length about 1.46 mm; pronotum length 0.38 mm, pronotum maximum width 0.54 mm; elytra length 1.08 mm, combined maximum width of elytra 0.69 mm. Body elongate, subparallel-sided, convex; glabrous, elytra with very fine, incon-



Fig. 1. *Petalium bruteno* sp. nov., holotype, 6781 [MAIG], habitus: A – dorsal view; B – ventral view

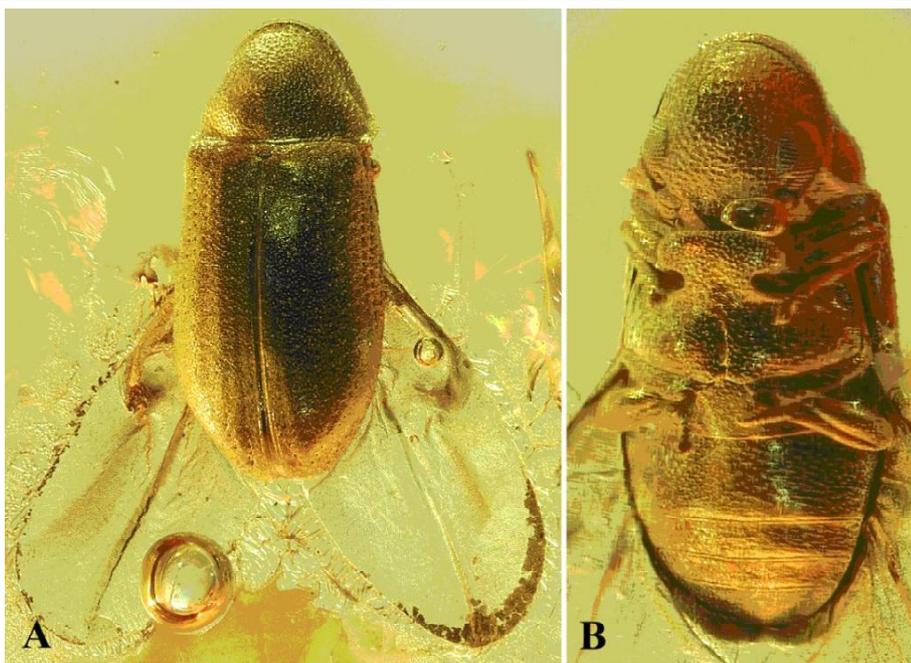


Fig. 2. *Petalium bruteno* sp. nov., paratype, 6782 [MAIG], habitus: A – dorsal view; B – ventral view

spicuous recumbent pubescence; unicolorous brown-rufous (as preserved).

Head hypognathous, turned downwards and not visible in dorsal view; densely covered with coarse punctation, distance between punctures lesser than diameter of one puncture; frons wide, weakly convex, without carina or longitudinal impression. Compound eyes rather large, convex, oval, with inner margin slightly emarginate at antennal insertion, with distinct facets, without ommatidial setae, widely separated. Frontoclypeal suture fine, slightly impressed. Labrum very small. Mandibulae large.

Antennae apparently with 11 antennomeres (antennomeres 1–4 not visible), clavate; antennomeres 5 and 7 widened, swollen, globose, nearly as long as wide; antennomeres 6 and 8 small, narrow, elongate, about 1.8× as long as wide, antennomere 8 about 0.5× as wide as antennomere 7; antennomeres 9–10 forming distinct club, that apparently longer than antennomeres 1–8 combined; antennomeres 9 and 10 elongate, conical, dilated apically,

antennomere 9 about 2.4× as wide as and 2.4× as long as antennomere 8; antennomere 11 elongate oval with pointed apex, 2.5× as long as wide.

Pronotum convex, transverse, 1.4× as wide as long, with convex disc, margined, widest at base and narrowed anteriorly, strongly constricted in anterior one-third, with transverse impression at anterior angles; covered with large and dense punctation, punctures smaller on disc and in anterior portion of pronotum, distance between punctures lesser than diameter of one puncture. Anterior pronotal angles subrectangular, slightly rounded, not visible in dorsal view; posterior pronotal angles widely rounded and barely marked. Lateral margins slightly rounded; posterior margin bisinuated with wide median lobe; anterior margin upturned, convex in dorsal view, arcuate in frontal view. Prohypomera impressed, with dense and coarse punctation.

Scutellar shield small, transverse, 1.3× as wide as long, pentagonal with widely rounded apex, covered with small punctures.

Elytra elongate, 1.6× as long as wide, subparallel-sided, widest in posterior one-third, slightly tapered posteriorly, with transverse impression in anterior one-fourth; humeri distinctly prominent. Elytral punctures fine, round, regular, each elytron apparently with 10 rows; distance between punctures in rows equal to 1–2× diameter of puncture, distance between rows equal to 2–3× diameter of puncture; intervals wide, flat, covered with micropunctuation. Metaventricle with convex disc; medial groove distinct in posterior one-fourth; densely covered with small punctuation; anterior median lobe large, with oval excavation posteriorolaterally for reception of mesotarsus.

Legs short, slender. Metacoxae narrow, strongly transverse, separated. Trochanters small, slightly elongate. Femora flattened, slightly dilated medially, carinate dorsally, with deep ventral groove for tibia reception; metafemora not extending beyond elytral lateral margins. Tibiae almost straight, narrow, slightly longer than femora. Tarsi pentamerous, short, shorter than tibia, tarsomeres subcylindrical; protarsi distinctly dilated; relative length ratios of protarsomeres 1–5 equal to 5-3-2-2-4. Pretarsal claws thin, simple, free, strongly divergent.

Abdomen with five freely articulated, visible ventrites, covered with small and dense punctuation; ventrite 1 with short, triangular intercoxal process, and with transverse excavation in anterior half for reception of metathoracic legs; ventrite 2 largest; ventrite 5 with widely rounded apical margin; sutures slightly concave. Relative length ratios of ventrites 1–5 equal to 13-16-9-7-9 (medially; including intercoxal process).

Paratype 6782 [MAIG] Body length is 1.42 mm. Sutures between abdominal ventrites almost straight. Otherwise, this specimen is similar in all visible morphological characters to holotype 6781 [MAIG].

Paratype PET01 [JHAC]. Body length is 1.45 mm. Otherwise, this specimen is similar in all visible morphological characters to holotype 6781 [MAIG].

Differential diagnosis. *Petalium bruteno* sp. nov. can easily distinguished from two dorcatomine ptinids described from Baltic amber, *Stagetus arturi* Háva & Zahradník, 2020 and *Calymmaderus ambericus* Háva & Zahradník, 2020, in the metathoracic ventrite with broad rounded lobe, in another body form and elytral striation (*Calymmaderus ambericus* has only three distinct striae on apex of each elytron only), distinctly longer ventrite 2 (as long as ventrites 3 and 4 combined).

Derivatio nominis. Noun in apposition. Bruteno (also Pruteno or Prutanis) is the mythologized Prussian cultural hero, elder brother of Widewuto, the first high priest (Kriwe-Kriwajto) of the pagan Prussians during the VI century.

***Petalium widewuto* sp. nov.**
(Fig. 3)

Type material. Holotype: collection number “6783” [MAIG] (ex. coll. Jonas Damzen JDC 6378); adult, sex unknown. Almost complete beetle (right metatibia and tarsus are missing) with partially exposed metathoracic wings included in a transparent, yellow amber piece with approximate dimensions of 21 mm × 9 mm and a maximum thickness of 6 mm; preserved without supplementary fixation. Syninclusions: one small detrital particle, and few small gas vesicles.

Type stratum. Mid-late Eocene, 48–34 Ma (Sadowski et al. 2017, 2020; Seyfullah et al. 2018; Bukejs et al. 2019; Kasiński et al. 2020).

Type locality. Baltic Sea coast, Yantarny settlement (formerly Palmnicken), Sambia (Samland) Peninsula, the Kaliningrad Region, Russia.

Description. In general appearance, characters of body and legs very similar to *P. bruteno* sp. nov. Measurements: total body length about 1.55 mm; pronotum length 0.35 mm, pronotum maximum width 0.54 mm; elytra length 1.20 mm, combined maximum width of elytra 0.69 mm. Body elongate, subcylindrical, convex, strongly retractile; apparently covered with sparse, very fine,



Fig. 3. *Petalium widewuto* sp. nov., holotype, 6783 [MAIG], habitus: A – ventral view; B – dorso-lateral view

inconspicuous recumbent pubescence; unicolorous brown-rufous (as preserved).

Compound eyes rather large, convex, roundish, with inner margin indistinctly emarginate at antennal insertion, with distinct facets, without ommatidial setae, widely separated by about 1.8× transverse diameter of eye. Fronto-clypeal suture fine, indistinct, slightly impressed. Labrum very small. Antennae, maxillary and labial palps not visible in examined specimen.

Pronotum convex, transverse, 1.5× as wide as long, with convex disc, margined, widest at base and narrowed anteriorly, strongly constricted in anterior one-third, with transverse impression at anterior angles; covered with large and dense punctation, punctures smaller on disc and in anterior portion of pronotum, distance between

punctures lesser than diameter of one puncture. Anterior pronotal angles subrectangular, slightly rounded, not visible in dorsal view; posterior pronotal angles widely rounded and barely marked. Lateral margins slightly rounded; posterior margin bisinuated with wide median lobe; anterior margin upturned, convex in dorsal view, arcuate in frontal view. Prohypomera slightly impressed, with dense and coarse punctation.

Scutellar shield small, transverse, 1.3× as wide as long, pentagonal with widely rounded apex, covered with small punctures.

Elytra elongate, 1.7× as long as wide, subparallel-sided, widest in posterior one-third, slightly tapered posteriorly, with transverse impression in anterior one-fourth; humeri distinctly prominent. Elytral punctures large, round, regular, each

elytron apparently with 10 rows; distance between punctures in rows equal to 0.3–1.0× diameter of puncture, distance between rows lesser than diameter of puncture; intervals narrow, flat, covered with microsculpture. Macropterous. Metaventrite with slightly convex disc; medial groove distinct in posterior one-fourth; densely covered with small punctation; anterior median lobe large, with oval excavation postero-laterally for reception of mesotarsus.

Legs short, slender; fore legs not visible in examined specimen. Metacoxae narrow, strongly transverse, separated. Femora flattened, slightly dilated medially, carinate dorsally, with deep ventral groove for tibia reception; meso- and metafemora not extending beyond elytral lateral margins. Tibiae almost straight, narrow, slightly longer than femora. Tarsi pentamerous, short, shorter than tibia, tarsomeres subcylindrical.

Abdomen with five freely articulated, visible ventrites, covered with small and dense punctation; ventrite 1 with short, triangular intercoxal process, and with transverse excavation in anterior half for reception of metathoracic legs; ventrite 2 largest; ventrite 5 with widely rounded apical margin; sutures slightly concave. Relative length ratios of ventrites 1–5 equal to 13-16-9-7-9 (medially; including intercoxal process).

Differential diagnosis. *Petalium widewuto* sp. nov. is similar to *P. bruteno* sp. nov. in many visible characters, but can be distinguished from it in distinctly larger elytral punctation with distance between punctures in rows lesser, than one puncture diameter.

Derivatio nominis. Noun in apposition. Widewuto (also Videvutis, Vaidevutis, Witowudi or Waidevut) is the mythologized Prussian cultural hero, youngest brother of Bruteno, a legendary king of Prussians during the VI century.

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