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# *Eurapatophysis groehni* n. gen. and n. sp. (Coleoptera: Cerambycidae) from Baltic amber: the first fossil member of the tribe Apatophyseini Lacordaire, 1869

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*Eurapatophysis groehni* n. gen. and n. sp. from Baltic amber (Early Oligocene) is described. The new taxon is related to the Indochinese *Mimapatophysis* Miroshnikov, 2014 and the Himalayan *Protapatophysis* Semenov-Tian-Shanskij & Stschegoleva-Barovskaia, 1936, from which it differs in the smaller body size, the strongly punctured head and pronotum, as well the elytral sculpture. Hypotheses concerning the habitat of this fossil taxon and the paleontological history of the Asian Dorcasominae are proposed.

Key-words. Coleoptera, Cerambycidae, Dorcasominae, Apatophyseini, Baltic amber, taxonomy.

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## INTRODUCTION

The tribe Apatophyseini Lacordaire, 1869 currently includes 94–95 genera and nearly 300 species. Together with the small tribes Dorcasomini Lacordaire, 1868 (1 genus, 8 species), Protaxini Gahan, 1906 (1–2 genus, 5–6 species) and Trypogeini Vives, 2005 (1 genus, 10 species) it forms the subfamily Dorcasominae Lacordaire, 1868 (Zicha 1999–2016).

The validity of all tribes and the position of several genera are still controversial (Miroshnikov 2014) and some species might be still misclassified as Lepturinae or Cerambycinae; however, Dorcasominae are principally widespread in Madagascar (78 genera and 257 species) with some taxa in Oriental Asia and in mountain or arid regions of southern and eastern Africa, southern Mediterranean and central Asia (Švácha & Lawrence 2014).

The only one known fossil species belonging to this subfamily is *Protaxis chinensis* Zhang, 1989 from Middle Miocene of Shanwang, China (Zhang 1989), a rather doubtful specimen fossilised on mudstone. Thus, the first fossil representative of the tribe Apathophyseni and the first surely identifiable Dorcasominae is described in this paper, dating the scientific documentation of this subfamily back to Lower Oligocene.

## MATERIALS AND METHODS

The type is embedded in a piece of yellow-orange amber having almost a form of a triangular prism, 24 mm long x 5 mm side. The amber includes some small bubbles and microscopic pieces of possible wood. No stellate hairs are present. The specimen lacks the right antenna after the half of the fourth segment and the left antenna after the third one.

Observations on the fossils were made using a stereomicroscope Antares Geminar 3 with 20–40x eyepieces equipped with a micrometer system.

Pictures (Figs. 1–4) were taken by Carsten Gröhn using a Zeiss stereomicroscope with digital Canon EOS 450D camera and lenses Zeiss Luminar 100/63/40 mm. Each photo is stacked with about 50 single photos through the program Zerene Stacker. The reconstruction of the habitus (Fig. 5) has been obtained with a mixed traditional-computer graphic technique.

## SYSTEMATIC PART

**Cerambycidae Latreille, 1802**
**Dorcasominae Lacordaire, 1868**
**Apatophyseini Lacordaire, 1869**

***Eurapatophysis* n. gen.**
(Figs. 1-5)

**Differential diagnosis**
The particular aspect of the tarsi (deeply concave, with broadened onychium) is peculiar of some genera of the subfamily Dorcasominae.

Tarsomere III deeply concave (Fig. 4), metatibiae with two spurs and without deep emargination at apex, scape not strongly broadened at apex, antennae non-serrate, pronotum with strong lateral tubercles and elytral punctures point to *Mimapatophysis* Miroshnikov, 2014 and *Protapatophysis* Semenov-Tian-Shanskij & Stschegoleva-Barovskaia, 1936.

The new fossil genus differs from both extant genera in the smaller body size (9 mm rather than 13.8–16.8 mm of *Mimapatophysis* and 16–27 mm of *Protapatophysis*), the strongly punctured head and pronotum, as well the peculiar elytral sculpture. Considering that the third antennomeres reach posteriorly the pronotal spines, the antennae should have been longer than those of both extant genera, possibly as long as body in females.

The elytral shape is analogue to that of *Protapatophysis* and the Laotian *Mimapatophysis gressitti* Miroshnikov, 2014; therefore, it should be considered as an archaic character.

Even if the small body size approaches *Eurapatophysis* n. gen. to *Mimapatophysis*, acute pronotal spines, transverse scutellum and, possibly, longer antennae approach it to *Protapatophysis*.

**Description**

Female. General habitus stout, fairly elongated, convex.

Head short; forehead sub-vertical, with a longitudinal large furrow, covered with rough, locally dense, punctures; antennal tubercles approached and fairly elevated; eyes moderately convex, shallowly emarginated, coarsely facetted; temples posteriorly convergent, as long as eyes. Last maxillary palpomere oval, truncate at apex, as long as previous one.

Antennae (probably) eleven-segmented and long, robust, covered with fine dense punctures, a dense fine recumbent pubescence and some raised setae at the apex of the antennomeres. Scape robust, bowed, inflated at apex; pedicle elongated, one-half as long as scape; antennomere III a bit longer than scape, moderately inflated at apex, posteriorly reaching the level of the pronotal spines; remaining antennomeres lacking.

Fig. 1. *Eurapatophysis groehni* n. gen. and n. sp., holotype, dorsal side.

Fig. 3. *Eurapatophysis groehni* n. gen. and n. sp.., holotype, lateral side.

Fig. 4. *Eurapatophysis groehni* n. gen. and n. sp., holotype, protarsus.

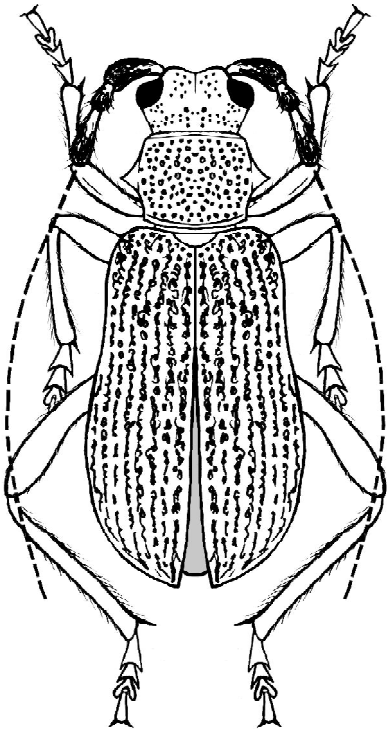

Fig. 5. *Eurapatophysis groehni* n. gen. and n. sp., reconstruction.

Fig. 2. *Eurapatophysis groehni* n. gen. and n. sp., holotype, lateral side.

Pronotum transverse, on-sixth wider than long, cylindrical, armed with a long acute spine at each side; base and apex weekly convex, both extremely finely furrowed; disc convex, covered with rough dense punctures. Scutellum transverse, twice broader than long.

Elytra relatively short, twice as long as wide at humeri, almost parallel-sided, evidently broadened on the apical half; base straight, wider than prothorax including spines; humeri and apex rounded; surface covered with rough dense punctures forming numerous irregular longitudinal striae.

Ventral side covered with dense punctures and a semi-recumbent pubescence; prosternal process narrow; metasternum without median suture; last (visible) urosternite rounded at apex.

Legs robust, moderately long, covered with semi-recumbent pubescence; metatibiae with two apical spurs, not emarginate at apex; tarsi I slightly concave, acutely produced at apex; tarsi II concave, rounded at apex; tarsi III deeply concave, rounded at apex; onychium scarcely broadened toward apex; claws simple; metatarsomere I as long as the next two metatarsomeres combined; metatarsomere II twice as long as III and as long as the onychium.

**Etymology**

From the stem Eur- (for "European") and the genus name *Apatophysis*.

**Type-species**

*Eurapatophysis groehni* n. sp. (monotypic).

***Eurapatophysis groehni* n. sp.**

**Holotype**
Baltic amber, Yantarny, GPIH4590, coll. C. Gröhn no. 8500 (ex DAM 4308), Centrum für Naturkunde – CeNak (ex Geologic-Paleontological Institute of University Hamburg), Section Geology and Palaeontology, Hamburg (Germany). Age: Early Oligocene (Vitali & Damgaard, 2016).

**Description**

Characters of the genus.

Body length: 9 mm. Width at shoulders: 3 mm. Original body colour, in all likelihood, uniformly reddish brown; darker on pedicle and apex of the basal antennomeres.

**Etymology**

I am honoured to dedicate this new species to Carsten Gröhn, Glinde (Germany), owner of this interesting specimen, as well as sponsor and supporter of the research on the fossil Baltic fauna with purchases of new species and helpful suggestions through his Web-site ambertop.de.

## DISCUSSION

At first glance, the ecological exigencies of *Eurapatophysis* n. gen. seem to be uncertain on the basis of the extant closely related genera.

In fact, *Mimapatophysis* seems to range along the border between Thailand and Laos (Pakkading to Vientiane), though the exact typical locality of *M. solodovnikovi* Miroshnikov, 2014 is actually unknown (Miroshnikov, 2014). The local climate is tropical wet and dry with distinct monsoon and dry season.

In contrast, *Protapatophysis* inhabit Nuristan-type (i.e. high mountain mixed) forests at about 1000–2600 m from north-eastern Afghanistan to Kashmir and western Himalayas (Danilevsky, 2011). The local climate is mountain, with warm dry summers and cold wet winters.

*Mimapatophysis* could suggest sub/tropical preferences for *Eurapatophysis* n. gen. as well. Actually, the habitat of *Protapatophysis* is just the same colonised by the Boreal *Nothorhina punctata* (Fabricius, 1789) and the Himalayan *N. gardneri* Plavilshikov, 1934, whose extinct congener – *N. granulicollis* Zang, 1905 – is by far the most abundant cerambycid in Baltic amber

(Zang, 1905; Klebs, 1910; Hieke & Pietrzeniuk, 1984; Vitali, 2006).

Moreover, the current distribution of Dorcasominae (absent in Australia and America) suggests that this subfamily evolved in Gondwana after its separation from Australia during Lower Cretaceous. The fauna inhabiting India spread into Asia after the collision of both continents in Eocene (Aitchison et al., 2007). Thus, representatives of Dorcasominae could manage to reach Europe only after the draining of the Turgai Sea in Lower Oligocene (Briggs, 1995). A group of taxa, evidently of tropical origin, could have adapted itself to cooler and dryer conditions in the northern part of the Indian subcontinent. Then, this more cryophilic group managed to northwardly settle mountains and deserts of central Asia in Middle Eocene and European Baltic forests in Lower Oligocene. This group might have also included *Protaxis chinensis*, present in eastern China during the Middle Miocene (Zhang, 1989).

In all likelihood, *Eurapatophysis groehni* n. sp. was a thermophilic, but not sub/tropical, representative of the Baltic fauna, adapted to variable climatic conditions, including dry summers and cold winters. This habitat, the same of the extant genus *Nothorhina*, strongly contrasts with the scenario of tropical or subtropical forests and warm-temperate humid climates recently hypothesised for Baltic amber (Sadowski et al., 2016).

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