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First record of a fossil *Trinodes* larva from Baltic amber (Coleoptera: Dermestidae: Trinodinae)

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Abstract. The first larva of *Trinodes* sp. from Baltic amber is described and illustrated.

Key words: entomology, fossils, larvae, Coleoptera, Dermestidae, Trinodinae, *Trinodes*, Tertiary, Eocene, Oligocene, Baltic amber.

INTRODUCTION

The family Dermestidae is a diverse group with the number of cosmopolitan species numbering about 1300 species in the recent fauna. The subfamily Trinodinae contains the genus *Thylodrias* (1 species; cosmopolitan), *Trichodrias* (1 species; Asia), *Hexanodes* (1 species; New Zealand), *Trichelodes* (1 species; Australia), *Apsectus* (8 species; North and Central America), *Evorinea* (10 species; Ethiopian, Asia and Pacific), *Trinodes* (15 species; Palearctic, Ethiopian and Oriental), and *Trinoparvus* (2 species; Madagascar and New Caledonia) (Lawrence & Newton 1995, Háva 2009). The subfamily can be diagnosed by the suberect, long and stout hairs on dorsum, 11-segmented antennae with variable antennal club (1–6 segments), pronotum with paralateral striae, prohypomera without depressions for reception of antennal club, prosternum somewhat projecting anteriorly (Kirejtshuk et al. 2010, Peacock 1993). Larvae of Trinodinae are characterized by short, broad and more-or less ventrally curved body; dorsal vestiture of long,

erect or suberect spicisetae; hastisetae absent or represented by distinctive blunt-headed type; antennae relatively short with sensorium at apex on antennomere 2 at least 0.75 times as long as antennomere; epipharynx with four median papillae and without distal papillae (Lawrence & Ślipiński 2005).

The genus *Trinodes* is one of the 53 recently known genera in Dermestidae, and currently includes 15 species. Eleven species are indigenous to the Oriental region, 2 to the Ethiopian region, 1 is probably indigenous to the Holarctic region and 1 to the Palearctic region (Háva 2009). The genus is easy distinguished from the other genera by its small body size, its strong and complete prosternal process, subacute apically which fits into cavity at anterior edge of mesoventrite; ventrite 1 usually with two short lines diverging from inner edges of metacoxae; posterior edge of metaventrite with small, median notch, antennal club 3-segmented, antennae 11-segmented (Peacock 1993, Lawrence & Ślipiński 2005).

Larvae of *Trinodes* are characterized by its posterior margin of tergites without club-shaped setae; its tergites with scattered, erect black setae which are frequently longer than the length of one tergite; no recumbent setae present; membranous median dorsal line with a sclerotized strip along the anterior and posterior margin of tergite, enclosing a transverse membranous area on each side, from which most of the very long black setae arise; antennal segment 2 nearly as long and broad as 1; accessory appendage arising from apex of 2 and extending almost to apex of 3 (Peacock 1993).

Fossil records of dermestid beetles are well known especially from the Cenozoic era of Baltic and Dominican ambers, but also from lacustrine deposits of Europe and North America (Carpenter 1992, Wappler 2003). Basing on fossil elytra of doubtful affinity from Queensland (Australia), the family is known from the Late Triassic (Carpenter 1992).

Baltic amber is the world's most well-known source of amber dated from Late Eocene to Early Oligocene between 35 to 45 Ma. Fossil records in the subfamily Trinodinae described from Baltic amber are given in Larsson (1978), Spahr (1981), Háva & Prokop (2004, 2006), Háva et al. (2006, 2008). There are also known inclusions from Lebanese amber and from Lowermost Eocene French amber (Kirejtshuk et al. 2010). Short review of known fossil records of the subfamily Trinodinae with description of new genus and six new species is also given in Kirejtshuk et al. (2010).

MATERIAL AND METHODS

Material of insect inclusion is preserved in polished pieces of rather transparent amber, protected against weathering and damage by embedding in the synthetic resin (GTS / 2-component resin). Standard techniques of observation by a stereomicroscope (Nikon SMZ 800) and digital photography (Nikon Coolpix 4500) were used.

The terminology used in this paper follows Lawrence and Ślipiński (2005, 2010). The terms 'hastisetae' and 'spicisetae' follow Lawrence (1991).

The following abbreviations to measurements were used:

(TL) - total length, linear distance from anterior margin to posterior margin.

(TW) - total width, maximum linear transverse distance.

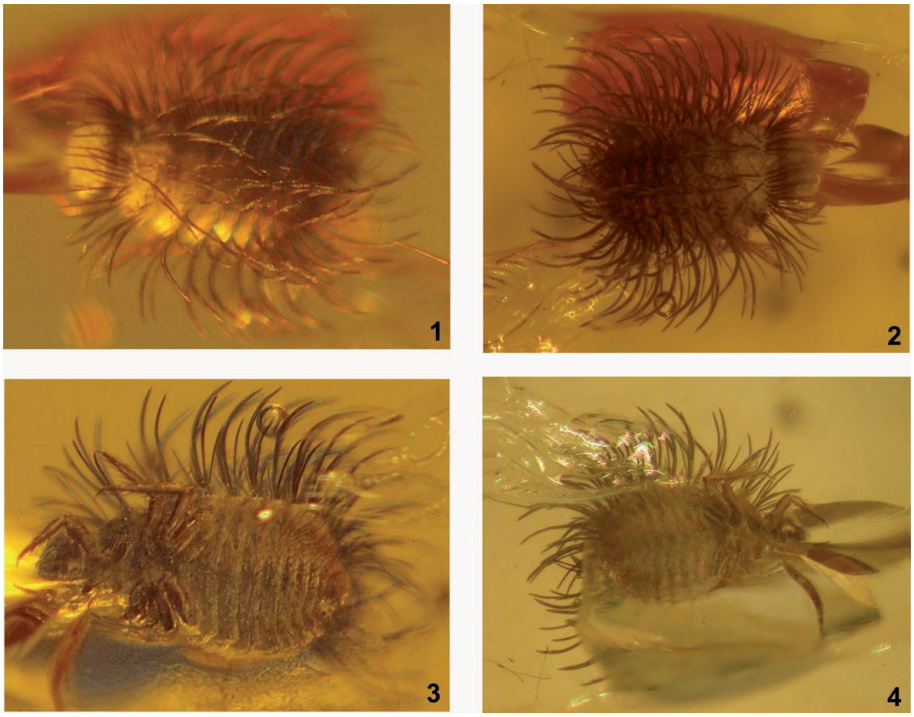
Fossil larva of *Trinodes* Dejean, 1821

Material examined

Amber inclusion of Baltic amber (TL: 25.0 mm; TW: 37.0 mm), Ustka (Poland), no 5369, leg. August 2008 A. Górski, 1 ex., coll. Andrzej Górski (Poland).

Description

The larva (TL: 1.0 mm; TW: 0.25 mm) are reminiscent of the larvae of *Anthrenus*, being broadly obovate and densely spinose, but differ in lacking brushes of hastisetae. Body short and stout, dorsum sclerotized (however pronotum seems to be weakly sclerotized), light brown; venter grey and rather unsclerotized. Head free, hypognathous and subglobular; frons triangular; head bearing nudisetae only. Antennae not visible from above and below. Stemmata not visible. Larva (thoracic and abdominal tergites) is covered with numerous long or short stout, erect black/brownish setae: spicisetae and setae with shaft typical of hastisetae but with a more or less obovate-shaped head rather than spear-shaped head; posterior margin of tergits without club-shaped setae; probably no recumbent setae present; urogomphi absent. Three pairs of 5-segmented legs visible; legs bearing short, erect setae. Abdominal sterna covered with the same setation as legs.



1-4. Larva of *Trinodes* sp. from Baltic Amber. 1-2: habitus, dorsal aspect; 3-4: habitus, ventral aspect. Figs. 1, 3 (A. Górski); Figs. 2, 4 (M. Kadej)

Remarks

Besides *Trinodes* two other genera are currently assignated to the tribe Trinodini Casey, 1900. These are a Nearctic genus *Apsectus* LeConte 1854 and *Evorinea* Beal, 1961, largely Oriental and Afrotropical genus. A key to identification of closely related genera in Trinodinae is given below (Beal 1959, Hinton 1945, Peacock 1993, Reese 1943, Veer & Rao 2000):

1. Antennna with second segment much narrower and shorter than first; posterior margin of tergites with club–shaped setae; tergites without dorsal line …… ……..... *Thylodrias* Motschulsky, 1839
–. Antennna with second segment nearly as long and broad as first; posterior margin of tergites without club–shaped setae; tergites with membranous median dorsal line .....…... 2.
2. Accesory sensory papillae (sensorium) arising from apex of antennal segment 2 and distinctly extending over the apex of segment 3 ……. *Trinodes* Dejean, 1821
–. . Accesory sensory papillae (sensorium) arising from apex of antennal segment 2 terminates close to the apex of segment 3 …… 3.
3. Two long setae present on apex of segment 3. Some abdominal spicisetae with six rows if spicae (spikes) at base distally reduced to four quadrangular rows, some short spicisetae with four rows of spicae in quadrangular arrangement …… ..…….....…… *Evorinea* Beal, 1961
–. One long seta at apex of segment 3 or one long and one short seta. All abdominal spicisetae with spicae (spikes) in 4 rows throughout ……...…… …….....…… *Apsectus* LeConte, 1854

For the 15 described species assigned to the genus *Trinodes* Dejean, 1821 (Háva 2009), only very brief and superficial descriptions of larvae of the extant species *Trinodes hirtus* (Fabricius, 1781) (Korschefsky 1944; Peacock 1993) and *T. rufescens* Reitter, 1877 (Hinton 1945) are available.

From the genus *Trinodes* only one fossil immature stadium of the species (*Trinodes puetzi* Háva & Prokop, 2006) has been described from Baltic Amber so far. It was impossible to observe morphological diagnostic characters allowing to classify it to a specific species within the genus *Trinodes* Dejean, 1821 in our fossil larva. Apart from descriptions of fossil imaginal forms of Dermestidae, only one larval species from the genus *Trogoderma* (*T. larvalis*, Háva, Prokop & Herrmann, 2006) has been described.

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