A new species of the genus Orchesia Latreille (Coleoptera: Melandryidae) from Baltic amber with a key to species described from fossil resins

VITALII I. ALEKSEEV¹, ² & ANDRIS BUKEJS³
¹MAUK “Zoopark”, Mira av., 26, 236028 Kaliningrad, Russia
²Department of Zootechny, FGBOU VPO Kaliningrad State Technical University, Sovetsky av. 1, 236000, Kaliningrad, Russia.
E-mail: alekseev0802@yahoo.com
³Institute of Systematic Biology, Daugavpils University, Vienības 13, Daugavpils, LV-5401, Latvia. E-mail: carabidae@inbox.lv

Abstract

Orchesia (Orchestera) canaliculata sp. nov. is described and illustrated from Eocene Baltic amber (Kaliningrad Region, Russia). New fossil records on O. turkini Alekseev & Bukejs and O. rasnitzyni Nikitsky are presented. A key to species of Orchesia Latreille, described from fossil resins, is provided.

Key words: false darkling beetles, Orchesia (Orchestera) canaliculata, new species, Tertiary, Eocene, fossil resin, new records

Introduction

The Melandryidae are relatively well represented by fossils in Baltic amber but have, however, remained incompletely examined (Alekseev 2013). False darkling beetles, and particularly representatives of the genus Orchesia Latreille, 1807, have been known from Baltic amber for a long time (Hope 1836; Helm 1896; Handlirsch 1907; Klebs 1910; Bachofen-Echt 1949; Larsson 1978; Spahr 1981; Kubisz 2000, 2001), but the species were left undescribed. One fossil species of Orchesia has been described from Eocene Baltic amber (O. turkini Alekseev & Bukejs, 2012) and one from Rovno amber (O. rasnitzyni Nikitsky, 2011), both of approximately similar age.

This work is the fourth paper describing false darkling beetles found in Baltic amber (Seidlitz 1898; Alekseev & Bukejs 2012; Alekseev 2014). In the current paper, the third extinct species of Orchesia is described, figured, compared with other fossil species, and a key provided.

Material and methods

The material examined is deposited in the following collections: Private collection of Christel and Hans Werner Hoffeins (Hamburg, Germany) [CCHH]; Private collection of Andris Bukejs (Daugavpils, Latvia) [CAB]; Private collection of Vitalii I. Alekseev (Kaliningrad, Russia) [CVIA]; Private collection of Andrzej Górski, (Bielsko-Biała, Poland) [CAG].

The CVIA amber material (Nr. AWI-055, the holotype of Orchesia canaliculata sp. nov.) is currently housed in the private collection of Vitalii I. Alekseev (Kaliningrad, Russia), but will be deposited in the Paleontological Institute, Russian Academy of Science (Moscow) for permanent preservation. The CCHH ambers (Nr. 882-4 and Nr. 1799-4) are currently deposited in the private collection of Christel and Hans Werner Hoffeins (Hamburg, Germany) and will be donated to the Senckenberg Deutsches Entomologisches Institut in Müncheberg, Germany (SDEI) for the institute's amber collection.

The amber pieces from the CCHH have been prepared manually and embedded in polyester resin (Hoffeins 2001). The pieces from the CVIA, CAG and CAB were polished by hand only, thus allowing dorsal and lateral views of the included beetle.
Although most estimates of the age of Baltic amber have placed it as deriving from the early Middle Eocene (Lutetian, 48.6–40.4 Ma), based largely on K-Ar dating (Ritzkowski 1997), palynological biostratigraphy of the specific region where the sample originated suggests a younger, Upper Eocene (Priabonian, 37.2–33.9 Ma) (Aleksandrova & Zaporozhets 2008). For the purposes of this study, we follow the Priabonian estimation.

The photos were taken using a Nikon Coolpix 4500 Nikon digital camera attached to a Wild M3Z stereomicroscope (Nr. 882-4 CCHH), with a Zeiss AxioCam ICc3 digital camera attached to a Zeiss Stemi 2000-c stereomicroscope (Nr. AWI-055), and with a Nikon DS-Fi1 digital camera attached to a Nikon SMZ 745T stereomicroscope (Nr. No. 016 CAB and No. 1777 CAG). Illustrations were made based on free-hand drawing during examination of the original specimen. These drawings were subsequently scanned and edited using Adobe Photoshop CS8.

Systematics

Family Melandryidae Leach, 1815

Subfamily Melandryinae Leach, 1815

Tribe Orchesiini Mulsant, 1856

Genus Orchesia Latreille, 1807

Subgenus Orchestera Guillebeau, 1887

*Orchesia* (*Orchestera*) **canaliculata** sp. nov. (Figs 1–6)

**Type material.** Holotype: Nr. AWI-055 [CVIA], possible male. The complete beetle is included in small, transparent, polished amber piece in the form of almost equilateral triangle (with lateral lengths 16 x 16 x 15 mm and maximum thickness 7 mm), yellowish in color, without supplementary fixation. Other animal syninclusions are absent, and plant syninclusions are represented by some small, dark pieces of organic matter and one stellate fagacean trichome.

**Type strata.** Baltic Amber, Upper Eocene, Prussian Formation (Priabonian). Estimated age: 37.2–33.9 Ma.

**Type locality.** Yantarny village [formerly Palmnicken], the Sambian [Samland] peninsula, Kaliningrad region, Russia.

**Diagnosis.** This new species belong to subgenus *Orchestera* Guillebeau, 1887. This suggestion is based on two morphological characters which are diagnostic for this subgenus: 4-segmented antennal club and relatively narrow frontal area between eyes (Nikitsky 2011). *O. canaliculata* **sp. nov.** differs from all described fossil species of *Orchesia* (*O. rasnitzyni* Nikitsky, 2011; *O. turkini* Alekseev & Bukejs, 2012) in longer antennomere 1 (about 1.4 times as long as antennomere 2), longer metatibial spurs (equal in length to first metatarsomere), presence of shallow furrows on elytra, and shorter body length. This new species is similar to recent *O. (Orchestera) luteipalpis* Mulsant & Guillebeau, 1857 but differs in furrowed elytra, longer metatibial spurs, and shorter body length.

**Description.** Body length 2.7 mm (along midline from anterior margin of frons to abdominal apex), width 0.9 mm (at widest part of elytra); oblong, spindle-shaped, weakly convex; unicolorous fulvous; dorsally covered with short, dense, recumbent hairs.

Head inflexed downwards, densely and finely punctate. Eyes lateral, large, reniform and slightly prominent, with distinct facets larger than punctures on head. Frons between eyes narrow, with width equal to 0.5 times vertical diameter of one eye. Interantennal space narrow, about 1.5 times as wide as eye diameter. Antennae 11-segmented, clavate, inserted between and close to inner margin of eyes; short, reaching basal 1/5 of elytra; antennal club 4-segmented, relatively loose; length ratios of antennomeres 1-11: 7-5-4-4-3-3-3-4-4-6. First antennomere long cylindrical, about 4 times as long as wide. Maxillary palpi large (half as long as antenna), 4-segmented: basal palpomere minute; palpomeres 2 and 3 approximately equal in length, triangular; palpomere 4 large, cultriform; length ratios of palpomeres 1–4: 1-3-3-9.
Pronotum transverse, approximately 1.5 times as wide as long, broadest at base; with homogenous fine and dense punctures, interspaces smaller than one puncture diameter; lateral sides weakly rounded, gradually narrowed to anterior margin, posterior angles rounded, base weakly sinuate; with two shallow basolateral impressions.

Scutellum small, flat, widely rounded apically. Elytra gradually narrowed from base to apex; 2.3 times longer than wide (length 2.1 mm, max. width 0.9 mm); with clearly visible complete sutural stria reaching apex of elytra. Elytral punctures fine and dense. Each elytron with 4–5 very shallow furrows, intervals weakly convex on disc only.

Ventral surface covered with fine, dense and relatively homogenous punctures. Epipleura wide in anterior part and gradually narrowing posteriorly, extending to elytral apex. Metepisternum 4.6 times as long as wide. Metacoxae large, transverse, wider than metafemora. Abdominal ventrites 1 and 2 large, equal in length; length ratios of ventrites 1–5: 15-15-12-10-10.

**FIGURES 1–4. Orchesia canaliculata** sp. nov., holotype. 1) habitus, dorso-lateral view; 2) habitus, lateral view; 3) habitus, dorsal view; 4) details of abdomen, matathorax and elytra, lateral view. Scale bar – 1 mm.
FIGURES 5–6. Orchesia canaliculata sp. nov., holotype. 5) head, frontal view (reconstruction); 6) hind leg (reconstruction).

Legs moderately long; all tibiae and femora flattened; hind legs most robust; metatibiae distinctly dilated anteriorly, 0.7 times as long as mesotibiae. Mesotibiae with two spurs of different lengths (proportions 2:3); metatibiae with two equally long spurs, equal in length to metatarsomere 1. Protarsus equal in length to protibia, mesotarsus slightly longer than mesotibia, metatarsus 2.5 times as long as metatibia. Tarsal formula 5-5-4. Protarsi distinctly dilated, penultimate segment bilobed. Length ratios of protarsomeres 1–5: 5-5-5-5-6; length ratios of mesotarsomeres 1–5: 16-7-5-3-9; length ratios of metatarsomeres 1–4: 6-3-2-2. Claws simple, free, small.

Etymology. The epithet of this new species [Latin “canaliculatus” – grooved] refers to its furrowed elytra.

Note. The distinctly dilated protarsi suggests that the specimen is probably male.

New fossil records

Orchesia (Orchestera) turkini Alekseev & Bukejs, 2012

Material examined. One specimen with the collection number 1799-4 [CCHH], Baltic amber, Yantarny, Kaliningrad Region, Russia. Body length of the beetle is 3.6 mm. Syninclusions are absent.

Orchesia (Orchestera) rasnitzyni Nikitsky, 2011
(Figs 7–10)

Material examined. One specimen with collection number 882-4 [CCHH], Baltic amber, Yantarny, Kaliningrad Region, Russia. Body length of beetle is 3.7 mm. Syninclusions are represented by two stellate fagacean trichomes. One specimen with collection number 016 [CAB], Baltic amber, Yantarny, Kaliningrad Region, Russia. Body length of beetle is 4.1 mm. Syninclusions are absent. One specimen with collection number 1777 [CAG], Baltic amber, Gdańsk, Poland. Body length of beetle is 3.6 mm. Syninclusions are represented by few stellate fagacean trichomes.
FIGURES 7–10. Orchesia rasnitzyni Nikitsky. 7) specimen No. 882-4 [CCHH], habitus, ventro-lateral view; 8) specimen No. 016 [CAB], habitus, ventro-lateral view; 9–10) specimen No. 1777 [CAG]. Not reproduced to the same scale.
A key to species of *Orchesia* described from fossil resins

1. Elytra with longitudinal furrows; metatibial spurs as long as metatarsomere 1; smaller, body length 2.7 mm. Baltic amber (Kaliningrad Region, Russia) .............................................................. *O. canaliculata* sp. nov.
   - Elytra without longitudinal furrows, metatibial spurs slightly shorter than metatarsomere 1; larger, body length larger than 3.0 mm. .............................................................. 2
2. Elytra with transverse rugosity in basal 1/10; antennomere 11 is more than twice as long as antennomere 10; Body length 3.6–4.1 mm. Rovno amber (Ukraine), Baltic amber (Kaliningrad Region, Russia) ........................................... *O. rasnitzyni* Nikitsky
   - Elytra without transverse rugosity; antennomere 11 is 1.7 times longer than antennomere 10; body length 3.25–3.6 mm. Baltic amber (Kaliningrad Region, Russia) ......................... *O. turkini* Alekseev & Bukejs

Discussion

The material described herein demonstrates that *Orchesia rasnitzyni* Nikitsky, described from Rovno amber, occurs in true “East” or “Sambian” Baltic amber as well. With the inclusion of this species, there are three known species of beetles from three different families which occur in both types of amber (*Orchesia rasnitzyni* Nikitsky, 2001 [Melandryidae], *Anaspis horaki* Perkovsky & Odnosum, 2009 [Scraptiidae] and *Mimoplatycis notha* Kazantsev, 2013 [Cantharidae]). This discovery suggests the need for a more detailed comparison between the beetle fauna from these two amber types.

The occurrence of pear-like, drop-like and other natural forms of amber pieces corresponding to natural resin incrustations contradicts the general opinion regarding possible distant transport of Baltic amber by river or sea currents. The number of such natural-formed amber pieces (and also the presence of larger, heavier amber pieces) in deposits make it possible to conclude the proximity (and possibly the identity) of contemporaneous Baltic amber deposits relative to the territories roughly corresponding to Eocene amberiferous forests of the eastern Baltic region and on southern parts of the Baltic Sea.

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References


http://dx.doi.org/10.1111/j.1365-2311.1838.tb00157.x
http://dx.doi.org/10.1134/S003103011105008X