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Description of a new genus and species of Cantharidae from Eocene Baltic amber (Insecta, Coleoptera)

Fabrizio Fanti & Elvira Castiglione

Abstract

Mantimalthinus balticus gen. et sp. nov. is described upon one specimen embedded in Eocene Baltic amber from the Polish coast of Gdańsk Bay. The distinctive morphological characters of the new genus are: head rounded behind the eyes, pronotum transverse with hind margin strongly bordered, elytra nearly entirely covering the last abdominal segments and metatrochanter strongly elongated. No extant or fossil genus shows these features, and only *Malthinellus malickyi* Wittmer, from Thailand, seems to be morphologically related to the new species.

Keywords: Soldier beetle, Cantharidae, *Mantimalthinus balticus*, new genus, new species, amber, Eocene.

1. Introduction

The subfamily Malthininae Kiesenwetter, 1852 includes four tribes, whose main diagnostic characters are in gular sutures, number of ventrites, and in mandibles which can be without or with teeth (Brancucci 1980; Kazantsev 2013). Unfortunately many of these characters are not visible and appreciable in the specimen on which the genus and species described herein are based, but the overall appearance with pronotum transverse, strongly bordered and sculpted without carinae, the simple last urites and length of the elytra (almost covering the abdomen), make this new genus attributable to the tribe Malthinini Kiesenwetter, 1852. The fossil tribe Mimoplatycini Kazantsev, 2013 in fact, has a carinate pronotum and fewer number of ventrites, the extant tribe Malthodini Böving & Craighead, 1931 has a short elytra and the last urites of males are often modified, while the tribe Malchinini Brancucci, 1980 has a different pronotal shape. The tribe Malthinini is poorly known in the fossil records, with only one species described and other specimens of the genus *Malthinus* Latreille, 1806 from Baltic amber, cited at generic level (Fanti 2017), thus the new genus herein described is the first known of this tribe, limited to the fossil state without extant representatives.

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2. Material and methods

The only specimen of this new fossil taxon is included in a piece of amber found by Artur Robert Michalski along the coasts of the Baltic Sea, near the estuary of the Vistula River (Poland) in March 2016. The fragment of amber, triangular scale shaped, measures approximately 2.1 cm long x 0.5 cm wide and is 9 mm thick at its base (taking the dorsal part of the inclusion in the upper part), to get up to 1 mm moving towards the summit.

The specimen was cleaned and polished to allow a better view. It is deposited at the Museo Civico di Paleontologia e Scienze Naturali dell'Aspromonte (Bova – Reggio Calabria – Italy). The drawing has been hand-made with china ink and photographs were taken with a Canon EOS 600D camera mounted on a stereomicroscope Bresser, with the aid of a software for combination of images (focus stacking software).

3. Systematic palaeontology

Family Cantharidae Imhoff, 1856 (1815)

Subfamily Malthininae Kiesenwetter, 1852

Tribe Malthinini Kiesenwetter, 1852

Genus *Mantimalthinus* nov.

Etymology: The new genus is dedicated to Francesco Manti, entomologist at the Mediterranea University of Reggio Calabria, for his extraordinary passion for entomology and as a sign of deep friendship; with the addition of the name of the genus *Malthinus* Latreille, 1806. Gender: masculine.

Type species: *Mantimalthinus balticus* sp. nov. The genus is at present monotypic.

Diagnosis: The new genus can be attributed with certainty to the subfamily Malthininae for the habitus and

Fig. 1. *Mantimalthinus balticus* gen. et sp. nov., Baltic amber. Holotype, dorsal view. Bar = 1.0 mm.

maxillary palps unequal in length with the last segment globular and with pointed apex. The combination of distinctive characters of the new genus is as follows: head rounded back to the eyes and equipped by sparse punctation; pronotum transverse strongly bordered at the hind margin, in particular at the angles; elytra long, wrinkled, without impressed punctuation and without traces of ridges, leaving uncovered only the last urite (which appears like a caudal appendix); metacoxae not elongated; tibial spurs absent; trochanter III very elongated (in all other genera is rounded or rounded with narrow and short lobe stretched backwards). The combination of these characters is not present in any known genus. Only *Malthinellus malickyi* Wittmer, 1997, of Thailand, is similar to the new taxon, but it differs for presenting elytra with traces of ridges, head posteriorly slightly narrowed, legs with tibial spurs and pronotum differently shaped.

Mantimalthinus balticus sp. nov.
Figs. 1–4

E t y m o l o g y : From the Latin "*balticus*" = Baltic. Named in reference to the locality.

H o l o t y p e : Probably male, specimen included in Baltic amber, Artur R. Michalski *leg.*, deposited at the Museo Civico

Fig. 2. *Mantimalthinus balticus* gen. et sp. nov., Baltic amber. Holotype, ventral view. Bar = 1.0 mm.

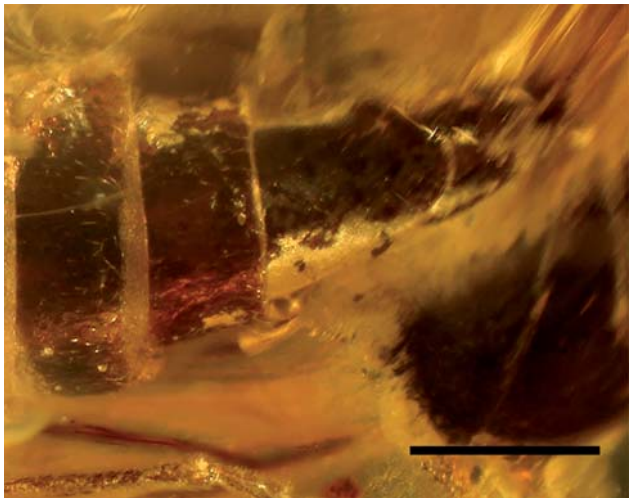

Fig. 3. *Mantimalthinus balticus* gen. et sp. nov., Baltic amber. Holotype, detail of the last sternites. Bar = 0.5 mm.

di Paleontologia e Scienze Naturali dell'Aspromonte (Bova, Italy).

Type locality: Poland: Baltic Sea coast, Gdańsk (Danzig) Bay, estuary of Wisła (Vistula) River.

Type horizon: Eocene: Lutetian: 48.6–40.4 Ma – Priabonian: 37.2–33.9 Ma.

Diagnosis: The species described herein is defined by the set of characters indicated above. Only *Malthinellus malickyi* WITTMER, 1997 of Thailand, seems to be morphologically close, but *Mantimalthinus balticus* is distinguished by the brown-dark uniform color instead of yellowish-orange, pronotum more transverse with the sides narrowed in the middle and the posterior margin highly bordered at the angles, the absence of tibial spurs, the head rounded and not slightly and gradually narrowed posteriorly, the last segment of maxillary and labial palps more pointed and the lack of traces of ridges on the elytra, while *Malthinellus malickyi* presents three indistinct ridges in the front half (GEISER, personal communication). Both species have elongated elytra that leave uncovered the last abdominal segment, into a kind of caudal appendage.

Description: Adult, probably male (for the last ventrite strongly elongated and narrowed), winged, dark-brown. Body length: about 3.9 mm; elytra: 3.0 mm; antennal length: 2.1–2.2 mm. Head blackish, completely exposed, large but slightly narrower than the pronotum, rounded, with numerous rough points scattered and shallow. Eyes black, small, round. Maxillary palps 4-segmented with palpomeres of different lengths, and with the last segment globular and pointed; third and last article of the labial palps also globular and strongly pointed. Antennae filiform, 11-segmented, dark blackish-brown, rather short and slightly over reaching the first third of the elytra, shortly pubescent, very long scape, reaching the front margin of pronotum and becoming strongly thickened from the half of its length up to the apex, antennomere II about two times shorter than the scape and also thickened towards the apex, antennomere III filiform and slightly longer than the second, antennomeres IV–VIII subequal, very long and almost 1/3 longer than the antennomere III, antennomeres IX–X long as the third, the antennomere XI very long and of the same length of antennomeres IV–VIII. Pronotum transverse about 1.3 times as wide as long, blackish, narrower than the elytra, covered with sparse and short pubescence, with the front margin slightly bordered and the hind margin strongly bordered, in particular at the angles that are wide and flattened, sides slightly narrowed in the middle, the hind part of the pronotum is wider than the anterior one. Scutellum large, triangular, without pointed apex but truncated. Elytra blackish, long, almost completely covering the abdomen (only the last urite remains uncovered), with parallel sides and strongly rounded apex, the whole surface roughly wrinkled,

Fig. 4. *Mantimalthinus balticus* gen. et sp. nov.; reconstruction of habitus.

with long hairs and without traces of ridges. Metathoracic wings present but covered almost entirely by the elytra, remaining discovered only a lateral part of the right wing. Metasternum subquadrate, posteriorly enlarged and pubescent; all ventral segments dark reddish-brown and covered by short pubescence in the apical part, the first sternites are quite broad and are followed by a very elongated last sternite with semi-rounded apex; last tergite small, slightly elongated, lobe shaped protruding from the elytra. Legs dark brown-reddish, short, with numerous and thick hairs; femurs short and slightly enlarged; tibiae cylindrical without spurs; metacoxae rounded; trochanter III very long and apically narrowed; tarsi pentamerous, first metatarsomere 1.5 times as long as the second metatarsomere, the third metatarsomere subequal to the second, the fourth bilobed and the fifth small and almost divided into two parts with the first in the shape of small subquadrate lobe and the second very thin; claws simple.

S y n i n c l u s i o n s : None.

R e m a r k s : The amber matrix is fairly transparent and the inclusion is complete, with only the not clearly visible mandibles.

4. Discussion

Some genera of this subfamily are little known and many of them are not currently present in Europe; two other fossil genera (*Mimoplatycis* Kazantsev, 2013 and *Archaeomalthodes* Hsiao, Ślipiński & Pang, 2016) present characters very different from those of the genus described herein (Kazantsev 2013; Hsiao et al. 2016; Fanti 2017); furthermore, many genera are considerably different from *Mantimalthinus* gen. nov. as: *Inmalthodes* Pic, 1938 with elongated "reticulated" elytra and a pronotum with prominent lateral lobes, *Caccodes* Sharp in Blackburn & Sharp, 1885, *Falsomalthinus* Pic, 1924, *Frostia* Fender, 1951, *Malthinellus* Kiesenwetter, 1874, *Malthinus* Latreille, 1806, *Malthodes* Kiesenwetter, 1852, *Maltypus* Motschulsky, 1860, *Paramalthinus* Brancucci in Brancucci & Wittmer, 1984, *Prosthaptus* Gorham, 1900, and the genus/subgenus *Protomaltypus* Wittmer in Wittmer & Brancucci, 1978, which present short or very short elytra and, moreover, some of them have the distal urites strongly modified (Fender 1951; Wittmer 1951, 1992; Brancucci 1980, 1982, 1984a, b, 2003, 2008; Brancucci & Wittmer 1984; Ramsdale 2002; Takahashi & Takahashi 2007; Takahashi 2016).

The taxa of the subfamily Malthininae with elongated elytra covering the abdomen and habitus similar to the new species are: *Malthinus* (*Indomalthinus*) Brancucci in Wittmer & Brancucci, 1978, *Macrocerus* Motschulsky, 1845, and *Mimomalthinus* Pic, 1931. The latter presents elytra with traces of ridges and rough points and a square pronotum (Brancucci 1980; Kazantsev 2006), whilst *Macrocerus*, which is the only genus similar to *Mantimalthinus* gen. nov. currently present in Europe (Brancucci 1980; Kazantsev & Nikitsky 2003), has, however, a slightly different habitus for the flattened pronotum with sides enlarged in the middle part and fore angles narrowed and rounded, the elytra completely covering the abdomen and the long antennae. The new genus also differs from the subgenus *Indomalthinus* for shorter elytra (completely covering the abdomen in *Indomalthinus*), not elongated hind coxae, trochanter III very elongated and pronotum more transverse, strongly bordered at the hind margin and not smooth and bright (Wittmer & Brancucci 1978; Brancucci 1980, 1983).

Mantimalthinus balticus sp. nov. looks similar to *Malthinellus malickyi* Wittmer, 1997, which, however, is quite different from the other species of the genus *Malthinellus*, for having much longer elytra, nearly reaching the abdominal apex, instead of short and covering up the sixth or seventh urite as in the other known species (Brancucci & Wittmer 1984; Wittmer 1997); it is possible that even for *M. malickyi* it would be necessary to establish a new genus, because the shape of the male genitalia does not match with the synapomorphies of the current genus (Takahashi, personal communication).

The tribe Malthinini Kiesenwetter includes some genera relatively uniform in external characters, to which also this new genus, although the mandibles are not visible, seems to belong. In fact, the elongated elytra covering almost completely the abdomen, and the last urites not modified, represent a character that is found quite frequently in the tribe. All the peculiarities of *Mantimalthinus balticus* sp. nov. makes it possible to ascribe it to a new genus, but only further finds of similar forms and hopefully with visible mandibles will allow a better understanding of the actual relationships.

We feel it useful to provide a key to the genera of the tribe:

Simplified key of genera and subgenera of the tribe Malthinini (from Brancucci 1980, 1982; Brancucci & Wittmer 1984; Kazantsev 2006):

1. Head very enlarged and flatten, pronotum elongated, elytra very short (often reaching only the first urite) ... . *Falsomalthinus* Pic
- Head never enlarged and flatten 2
2. Elytra covering up to fourth urite 3
- Elytra longer 4
3. Antennae filiform ..... *Caccodes* Sharp
- Antennae pectinate ..... *Paramalthinus* Brancucci
4. Elytra leaving uncovered some abdominal segments (except *Malthinellus malickyi*) 5
- Elytra almost completely covering the abdomen 6
5. Metacoxae elongated, head strongly narrowed backwards or sometimes rounded, yellowish or dark not bicolored appearance often with spots on the pronotum, elytra with imprinted punctuation or confusedly wrinkled and yellow spots at the apex often present.... ..... *Malthinus (Malthinus)* Latreille

- Metacoxae not elongated, head slightly and gradually narrowed backwards, tibial spurs always present, appearance generally bicolored with pronotum concolourous, elytra with punctuation and traces of ridges and without colored spots at the apex .... *Malthinellus* Kiesenwetter

6. Head narrowed behind the eyes, trochanters short or slightly elongated 7

- Head rounded behind the eyes, trochanter III strongly elongated, pronotum very reflanged at the hind margin, especially at the angles, with narrowed sides and hind part larger, elytra very wrinkled without traces of ridges ..... *Mantimalthinus* gen. nov.

7. Pronotum quadrangular with narrow sides and pronounced angles, metacoxae relatively short and narrow, short trochanter, elytra covering the abdomen with traces of ridges and coarse and sketchy points..... ..... *Mimomalthinus* Pic

- Pronotum never quadrangular, metacoxae elongated ... . *Malthinus (Indomalthinus)* Brancucci

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