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A new Lamiine longhorn-beetle from Madeira and the key to the Macaronesian Parmenini (Coleoptera: Cerambycidae)

With 7 figures

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ABSTRACT: A new species of longhorn-beetle of the tribe Parmenini is here described as *Paradeucalion maderense* sp. n.. Morphologically it seems to be close to *Paradeucalion desertarum* (Wollaston, 1854) from Desertas Islands and related also to *Deucalion oceanicum* Wollaston, 1854, from the Selvagens. The new species was found at night on plants of the genus *Rubus* or hiding inside dead shrubs or below the bark of several trees.

Keywords: Coleoptera, Cerambycidae, Lamiinae, Parmenini, *Paradeucalion*, taxonomy, bionomics, new species, key.

RESUMO: Uma nova espécie de escaravelho longicórneo é descrita com o nome *Paradeucalion maderense* sp. n.. Morfologicamente é próxima de *Paradeucalion desertarum* (Wollaston, 1854), espécie endémica das Ilhas Desertas e também se relaciona com *Deucalion oceanicum* Wollaston, 1854, endémica das Ilhas Selvagens. A espécie nova foi encontrada à noite, em plantas do género *Rubus*, ou no interior de arbustos secos e debaixo da casca de diversas árvores.

Palavras-chave: Cerambycidae, Lamiinae, Parmenini, *Paradeucalion*, taxonomia, bioecologia, espécie nova, chave dicotómica.

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INTRODUCTION

The Cerambycid tribe Parmenini is represented by four genera in the Western Palearctic (Danilevski, 2010). Three of these, all monotypic up to this day, are endemic to the Macaronesian region, while the largest genus *Parmena*, (which includes about 20 species), is not distributed in this area (Danilevski, 2010). The Canarian genus *Lepromoris* is sometimes included in Morimopsini, a tribe related to Parmenini (subfamily Lamiinae).

The first species of genus *Paradeucalion* Breuning, 1950, was found by entomologist Thomas Vernon Wollaston in 1849 at the top of Deserta Grande, the larger of the Desertas Islands and originally named *Deucalion desertarum* (Wollaston 1854). Unexpectedly, 167 years later a new species of the genus *Paradeucalion* was found, this time on Madeira proper; an island that had been frequently visited by entomologists and subject to their close attention. It was discovered in the northwest of the island in degraded native *Laurus*-forest during the winter period. The new species is here described and compared with the other three macaronesian species of the tribe Parmenini.

MATERIALS AND METHODS

Measurements of the specimens were taken as follows: body length – from the apex of mandibles to the apex of the elytra; body width – at the widest point of elytra; pronotal length – from its anterior to the posterior margin; elytral length – from the basal margin of scutellum to the elytral apex. Measurements were taken using a Leica M125 stereomicroscope and Leica Application Suite (LAS) software under 1-3.20x magnification.

Images of adults and the genitalia were created using a Canon EOS 60D camera with Canon MP-E 65mm f/2.8 1-5x Macro lens, composed using Helicon Focus image-stacking software. Image of the locality was created using an iPhone X smartphone (rear camera with 12MP sensor and 28 mm f/1.8 lens).

Aedeagus or spermatheca, if dissected, were glued using DMHF (dimethyl hydantoin formaldehyde resin) to same label as respective specimen (Holotype) or to an additional card attached to the specimen pin.

The locality data are given use the original spelling as written on labels; separate lines on labels are indicated by a semicolon and separate labels by a double slash; additional comments and explanations are given in square brackets. Taxonomy follows Danilevski (2010).

Abbreviations of the type depositories:

MMF – Museu de História Natural do Funchal, Madeira, Portugal.
NHMUK – The Natural History Museum, London, United Kingdom.
ISPC – Isamberto Silva private collection, Funchal, Madeira, Portugal.
JKPC – Jiří Krátký private collection, Hradec Králové, Czech Republic.
PKPC – Pavel Krásenský private collection, Chomutov, Czech Republic.
MAPC – Miguel Andrade private collection, Funchal, Madeira, Portugal.

RESULTS

***Paradeucalion maderense* Krátký & Aguiar sp. n.**

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Figures 1-4

Material studied. **Holotype**: Portugal – Madeira Island; 1 km S of Ribeira da Janela; 530 m; lgt. I. Silva 27.1.2019 [printed on white card] // HOLOTYPE; *Paradeucalion*; *maderense* sp. n. ♂; J. Krátký & A. Aguiar des. 2019 [printed, black lettering in red background, under side white] [coll. NHMUK]. **Paratypes**: same locality as in holotype: 16.11.2016, 1 ♀, lgt. P. Krásenský, coll. PKPC; 10.11.2018, 1 ♂, lgt. M. Andrade, coll. MAPC; 11.11.2018, 1 ♂, lgt. I. Silva, coll. ISPC; 16.12.2018, 1 ♀, lgt. I. Silva, coll. ISPC; 5.1.2019, 2 ♂♂, 1 ♀, lgt. I. Silva, coll. ISPC; 27.1.2019, 2 ♂♂, 4 ♀♀, lgt. I. Silva, coll. MMF 47922 & 47923, ISPC, JKPC, JVPC, MAPC; 3.2.2019, 3 ex., lgt. I. Silva, coll. ISPC // PARATYPE; *Paradeucalion*; *maderense* sp. n.; J. Krátký & A. Aguiar des. 2019 [printed, black lettering in red background, under side white]. **Other material**: same locality as in holotype: 13.10.2018, 1 ♂, 1 ♀ and 18.10.2018, 1 ♂, on *Rubus*, lgt. J. Krátký (specimens destroyed by accident); 3.2.2019, 3 spec., I. Silva observed.

Description of the holotype male

Body length: 9.1 mm, body width: 2.9 mm.

Integument and vestiture. Body completely pitch-black, shiny; only frons, apical third of tibia and basal parts of antennal segments reddish. Dorsal vestiture consists of adherent golden-yellow setae, distributed densely on frons and apical third of tibiae and forming spots on lateral tubercles of pronotum and at basal and apical parts of elytral intervals 3-9; the setae are paler on internal intervals (Fig. 1A). Ventral side glabrous, lateral parts of abdominal sternites covered densely with same golden setae as frons and apical third of tibiae and paler setae cover more sparsely the sides of metasternum (Fig. 2A).

Head. Frons completely flat with distinct middle sulcus forming a dark middle line, which is not covered by golden setae. Labrum black, glabrous, punctured. Eyes flat, divided in two lobes, embracing strongly elevated antennal tubercles; frons between the eyes about twice as wide as the width of one eye. Whole head, excluding its central part and the eyes, with sparse long and strongly erected whitish hairs. Antennae 11-segmented, 2 apical segments exceed the apex of elytra; its segment 1 about 2 times longer than wide at the widest point, strongly clubbed, segment 2 subconical, 1.3 times as long as wide, segment 3 elongate, subconical, about 4.7 times longer than wide, segments 4-11 similar to each other in shape, but decreasing in length; apical segment slightly flattened. Segments 2-9 with several erected whitish long hairs along inner side, several similar hairs are also present at the apex of outer side; segment 1 with 2-3 hairs only on outer side; apical 2 segments missing such hairs completely.

Pronotum. Almost as long as wide, subcylindrical, widest basad the middle, the widest point highlighted by sharp small tubercles covered with several golden setae, forming small spots; sides regularly and moderately rounded, basal ¼ strangled around the perimeter, basal part corrugated transversally, basal margin smooth and almost straight; median and apical parts distinctly elevated above the level of the basal part, dull and slightly corrugated, with median sulcus distinct in anterior and posterior part. Sides and the disc of pronotum with several long and strongly erected whitish hairs.

Elytra. 1.9 times as long as wide, suboval, widest in the middle of the length, sides narrowing apically, regularly rounded from humeral calli to regularly rounded apex. Striae shallow, straight, intervals corrugated by strong transverse punctures, which on the sutura and intervals 1-3 are distinct in basal half, apically only hinted and disappearing; each puncture is basally highlighted by small tubercle with semierected whitish hair, missing on the disc of elytra, inserted

isolated in shallow depressions at 45° to the elytral surface, 0.09-0.1 mm long. Apical margin of elytra with several long and erected whitish hairs.

Legs. Normally long, not robust or elongate. Femora widest in the middle of the length. Tibiae widened apically, the anterior and the posterior almost straight, the middle slightly S- shaped, with hinted teeth behind the middle of outer margin. Tarsi 0.9 times as long as tibiae, third segment cordate, wider than segments 1 and 2; claws edentate.

Abdomen. Sternites flat, sternite 5 with glabrous shallow subrhombal preapical impression.

Aedeagus. In ventral view, median lobe subtriangular, with regularly slightly rounded sides, apex very sharp; tegmen apically bilobed, with strong medial recess, apex of each lobe with several long setae (Fig. 3A). In lateral view, median lobe regularly curved, apical third almost straight with sharp apex; tegmen almost straight, the parameres regularly curved apicad (Fig. 3B).

Female. Similar to male (Figs. 1B, 2B), body in average 1.2 times longer than in male, body length 10.9-12.4 mm (instead of 9.1-10.3 mm in male), elytra a little more rounded on the sides, 2 times as long as wide; antennae as long as body, not exceeding elytral apex. Lateral spots of golden setae on elytra usually larger than in male. Apical sternite with preapical V- shaped tubercle. Spermatheca, ovipositor and sternite 8 as in Figs. 4A-C.

Variability. The species shows a small degree of variability; all known specimens have a similar habitus. Some variability was observed in the following areas: body length 9.1-11.5 mm; coloration of the integument of dorsal side from dark brown to brown-reddish; lateral spots of golden setae on elytra of variable size.

Differential diagnosis. Morphologically, the new species seems to be closest to *Paradeucalion desertarum* (Wollaston, 1854) (Fig. 5) from Desertas Islands. The shape of the prosternal projection suggests it is also related to *Deucalion oceanicum* Wollaston, 1854, (Fig. 6A) from the Selvagens Islands. According to the poor description of the genus *Paradeucalion* (Breuning, 1950) and its differentiation from the genus *Deucalion* based only on the form of the prosternal projection, the new species occupies an intermediate position and it is not uniquely clear to which of these genera it belongs. However, *Deucalion* has the dorsal side of its body completely and regularly covered by light setae. The almost glabrous dorsal side of the new species' body, with only local spots of golden setae makes it closer to *P. desertarum*, from which it differs mainly in size of body, 9.1-11.5 mm (instead of 13.8 – 20.9 mm in *P. desertarum*), reddish coloration and dense golden pubescence of frons (instead of dark brown and almost glabrous frons in *P. desertarum*) and already mentioned lateral spots of golden setae in basal and apical parts of elytra. Both species are also endemic to different islands, the new species to Madeira while *P. desertarum* to Deserta Grande and Bugio in the Desertas Islands. All species of the tribe Parmenini from Macaronesia can be differentiated and determined using the key at the end of the paper.

Etymology. The new species is named after the island of Madeira, where it appears to be endemic.

Distribution. Currently this beetle is only known from one location in the northwest of Madeira Island (Portugal).

Bionomics. All specimens were found during wintertime in degraded *Laurus*-forest in wet northwest of the island (Fig. 7). The identity of the host plant is not known with any certainty. Three specimens were beaten at night from shrubs of the endemic *Rubus vahlii*, which seems to be a most probable host plant for the new species. Other specimens were found occasionally during the day concealed under the bark of *Eucalyptus*, or in *Sphaeropteris cooperi* dead trunks and canes of *Arundo donax*. One specimen was collected using a butterfly net from the leaves of *Phyllis nobla* (M. Andrade, *pers. comm.*). However, the relationship to this plant was not confirmed. It is possible that the new species is polyphagous on leafy plants, as are some of the species in the related genus *Parmena* (Bense, 1995), for example, *P. pubescens* (Dalman, 1817).

Unfortunately, almost nothing is known about the bionomics of related *Paradeucalion desertarum* (Wollaston, 1854) from the Desertas Islands. This species has not been found for many years and is perhaps now extinct. All known specimens were found below stones on rocky slopes of Deserta Grande and Bugio Islands (Wollaston, 1854). However, Wollaston (1865) has no doubts that this insect lived in the stalks of some shrubby plant, possibly a spurge species like the endemic *Euphorbia piscatoria*, which grow at the type locality. Another closely related species, *Deucalion oceanicum* Wollaston, 1854, lives in shrubs of *Euphorbia anachoreta* endemic to Selvagens Islands. It is currently known only from the smallest island of the archipelago – Illhéu de Fora (Stüben, 2016). Canarian *Lepromoris gibba* (Brullé, 1838) (Fig. 6B) also lives in the dead branches and root collars of several *Euphorbia* species. Such knowledge led us to search for the possible relationship of the new species to *Euphorbia* on Madeira. At the type locality we observed several specimens of the Laurisilva Melliferous Spurge *Euphorbia mellifera*. However, these plants were out of reach, so we can only theoretically consider the possibility of this plant to be a host *Paradeucalion maderense*.

Behavior. According to Wollaston (1854), *Paradeucalion desertarum* produces a high stridulating noise. So audible that this "buzzing" noise attracted the attention of R. T. Lowe at the summit of Bugio and led him to collect the second specimen of the type series. Wollaston (1854) explains in detail the thorax morphology responsible for this sound mechanism, which involves the pronotum and mesothorax. We can confirm that *P. maderense*, when caught and held between fingers also emits this high stridulating noise, which suggests the presence of a similar thoraxical sound-producing mechanism.

Key to the species of Parmenini from the Macaronesia

1) Elytra regularly covered by setae, that cover densely the surface ---------- 2
- Elytra glabrous, sometimes with the spots of setae in basal and apical parts, most of integument glabrous and clearly visible ---------- 3

2) Frons between the eyes much narrower than the width of one eye; body larger, length 9-16 mm; pronotum transverse with long and sharp lateral spikes; elytra flat, broadly oval, much wider than pronotal base; antennae much longer than the body. Canary Islands. Habitus: Fig. 6B ---------- ***Lepromoris gibba* (Brullé, 1838)**
- Frons between the eyes broad, about 2 times larger than the width of one eye; body smaller, length 9-14 mm; pronotum subcylindrical with small and blunt lateral spikes; elytra long oval, strongly concave in transversal direction; antennae shorter than the body. Selvagens Islands. Habitus: Fig. 6A ---------- ***Deucalion oceanicum* Wollaston, 1854**

3) Large species, body length 13.8-20.9 mm; elytra almost glabrous, sometimes with hinted lateral spots of light hair-like scales near the apex; frons dark brown, almost glabrous, not covered by dense golden setae. Desertas Islands. Habitus: Fig. 5 ---------- ***Paradeucalion desertarum* (Wollaston, 1854)**
- Smaller species, body length 9.1-11.5 mm; elytra glabrous with conspicuous lateral spots of golden setae in basal and apical parts; frons reddish, covered by dense golden setae. Madeira. Habitus: Figs. 1A-B ---------- ***Paradeucalion maderense* Krátký & Aguiar sp. n.**

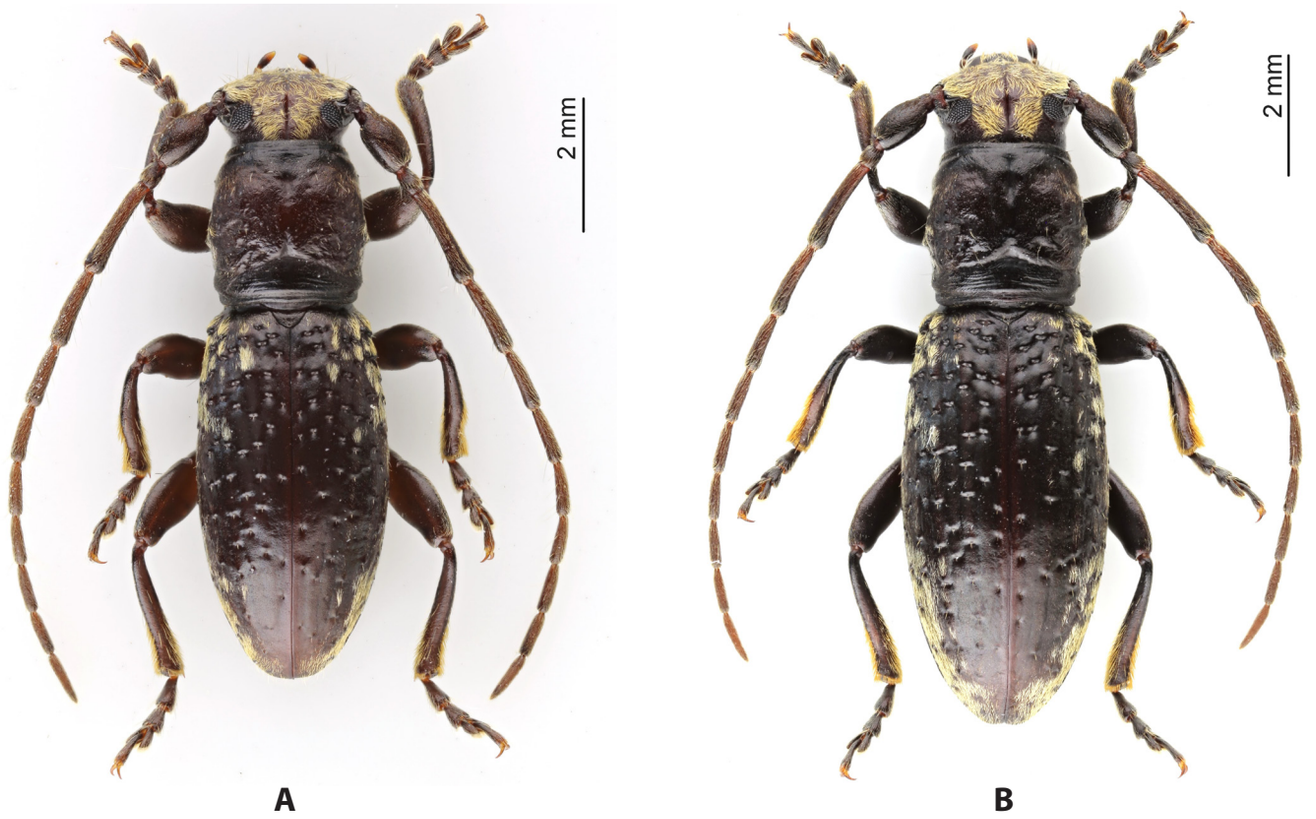

Fig. 1 – *Paradeucalion maderense* sp. n.. **A**) Male, holotype, dorsal view (photographed by J. Krátký); **B**) Female, paratype, dorsal view (photographed by J. Krátký).

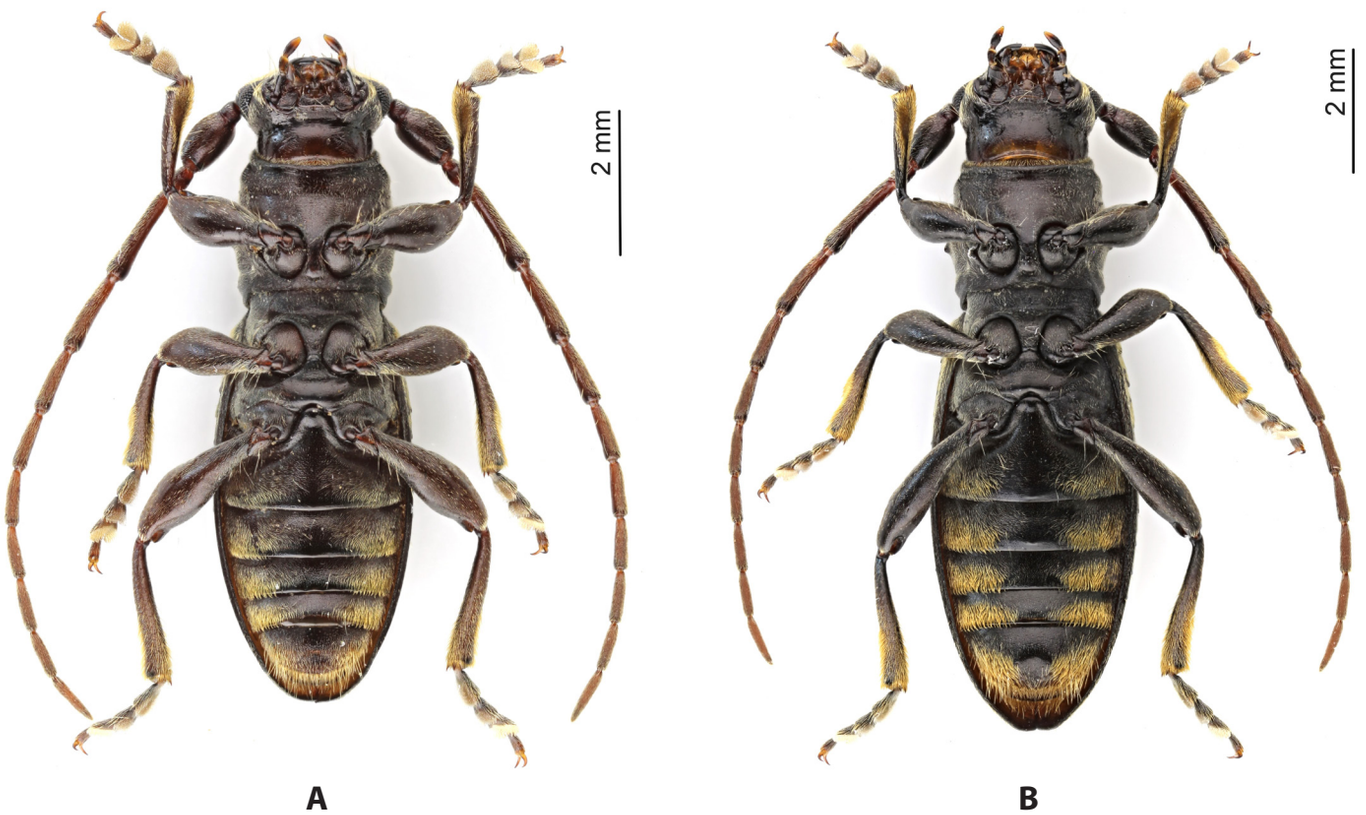

Fig. 2 – *Paradeucalion maderense* sp. n.. **A**) Male, holotype, ventral view (photographed by J. Krátký); **B**) Female, paratype, ventral view (photographed by J. Krátký).

Fig. 3 – *Paradeucalion maderense* sp. n.. **A**) Aedeagus in ventro-apical view, holotype (photographed by J. Krátký); **B**) Aedeagus in lateral view, holotype (photographed by J. Krátký).

Fig. 4 – *Paradeucalion maderense* sp. n., terminalia of female, paratype (photographed by J. Krátký): **A**) Spermatheca; **B**) Ovipositor; **C**) Sternite VIII.

Fig. 5 – *Paradeucalion desertarum* (Wollaston, 1854), female, paralectotype NHMUK 011220591 (photographed by K. Matsumoto).

Fig. 6 – **A**) *Deucalion oceanicum* (Wollaston, 1854) female from Illhéu de Fora, Selvagens Islands, coll. A. Aguiar (photographed by A. Aguiar); **B**) *Lepromoris gibba* (Brullé, 1838), male from El Hierro, Canary Islands (photographed by J. Krátký).

Fig. 7 – Habitat of *Paradeucalion maderense* sp. n., *locus typicus* (photographed by A. Aguiar).

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