



NEW SPECIES OF *PASSALUS (MITRORHINUS)* KAUP, 1871 (COLEOPTERA: SCARABAEOIDEA: PASSALIDAE) FROM THE EXTREME WEST OF THE BRAZILIAN AMAZON

NUEVA ESPECIE DE *PASSALUS (MITRORHINUS)* KAUP, 1871 (COLEOPTERA: SCARABAEOIDEA: PASSALIDAE) DEL EXTREMO OESTE DE LA AMAZONIA BRASILEÑA

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ABSTRACT. *Passalus (Mitrorhinus) nodifer* sp. nov., from the extreme west of the Brazilian Amazon in the state of Acre is described and illustrated. The new species can be recognized by the head with conspicuous and strong single secondary tubercle; frontal ridges straight and well-marked; mandibles with two apical teeth; aedeagus with parameres reduced with large and rounded apical margin and basal piece with a deep V-shaped notched in the medial region.

Key words: Passalinae, Acre, biodiversity, saproxilophages, taxonomy.

INTRODUCTION

Passalus Fabricius, 1792 is the largest genus of Passalidae, covering more than 150 species (Reyes-Castillo & Amat-Garcia, 1991), occurring about 60 species in Brazil (Fonseca & Reyes-Castillo, 2004). It is the most diverse genus of bess beetles in South America (Reyes-Castillo & Amat-Garcia, 1991) and is divided into three subgenera: *P. (Pertinax)* Kaup, 1869, *P. (Mitrorhinus)* Kaup, 1871 and *P. (Passalus)* Fabricius, 1792 (Luederwaldt, 1931). *P. (Mitrorhinus)* Kaup is characterized by having a single secondary tubercle on the front border of the head. It is the smallest of the three subgenera of *Passalus*, with only ten known species, with *P. zikani* Luederwaldt, 1929, the last species described. After a long hiatus in descriptions of new species, we describe here *Passalus (Mitrorhinus)*

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RESUMEN. *Passalus (Mitrorhinus) nodifer* sp. nov., del extremo occidental de la Amazonia brasileña en el estado de Acre se describe e ilustra. La nueva especie puede ser reconocida por la cabeza con el único tubérculo secundario conspicuo y fuerte; quillas frontales rectas y bien marcadas; mandíbulas con dos dientes apicales; eedeago con parameros reducidos con margen apical grande y redondeada y pieza basal con una muesca profunda en forma de V en la región medial.

Palabras clave: Passalinae, Acre, biodiversidad, saproxilófagos, taxonomía.

nodifer sp. nov., from the extreme west of the Brazilian Amazon.

MATERIAL AND METHODS

Two specimens collected during an expedition in the municipality of Feijó, Acre, Brazil, were compared with all species of the subgenus *P. (Mitrorhinus)* Kaup. The species that had affinities with *P. nodifer* sp. nov., were contrasted from the original description of these species as well as their synonym listed in Hincks & Dibb (1935). The description is based on the terminology proposed by Reyes-Castillo (1970) and the images were made using a Leica M165C stereomicroscope with a Leica DFC295 camera coupled and processed in the software LAS ver-

sion 4.2. The map was made with websoftware Simple-Mappr (Shorthouse, 2010).

RESULTS

Passalus (Mitrorhinus) nodifer sp. nov.

(Figs. 1-6)

Diagnosis: Head with conspicuous single secondary tubercle as strong as the external tubercles; frontal ridges straight, well-marked, reaching the outer tubercles. Mandibles with two apical teeth. Small and comma-shaped mesosternum fossae. Narrow and glabrous metasternal fossae. Aedeagus: parameres reduced with large and rounded apical margin, basal piece with a deep V-shaped notched in the medial region (ventral view).

Description: medium size (25 to 26 mm body length). Elongated and flat body. Bright black color (Fig. 3).

Head: In dorsal view (Fig. 1) labrum with anterior margin almost straight, with setae and punctures scattered throughout the structure. Asymmetrical mandibles, with the left inner middle tooth wider than the right; apex of the mandible bidentate, the upper apical tooth larger and narrower; high, straight dorsal teeth, covering half of the back of the mandible. Deep and smooth mandibular fossae. Apex of lacinia bidentate. Antennal club with five lamellae, the proximal lamella reduced, the second lamella one-third the size of the third, and the distal lamella slightly larger than lamellae three and four. Clypeus narrow and hidden under the frons. Head's anterior angles developed, acute and smaller than external tubercles, these highly developed, acute, oriented anteriorly. Single secondary tubercle located midway between the external tubercles and of the same length as these, but wider. Internal tubercles small and distinct, located at half the distance between the central tubercle and external tubercles. Frontal ridges elevated and weakly arched extending from the medial frontal structure, passing through the inner tubercles and reaching the outer tubercles. Frontal area transverse, glabrous, chalice-shaped, delimited by the frontal ridges, with few punctures and a small triangular-shaped mameelon (*sensu* Jiménez-Ferbans & Reyes-Castillo, 2014). Frontal middle structure *falsus* type, with small central tubercle and non-free apex; parietal tubercles large, low, sometimes inconspicuous, and not reaching the central tubercle. Frontal fossae glabrous, with no punctures and with little roughness. Ocular *canthus* developed, rough and rounded. Occipital groove strongly marked, arched

and smooth, extending to supraorbital tubercles. In ventral view (Fig. 2) hypostomal process slightly separated from mentum, smooth, shiny and glabrous. Mentum with punctuations throughout structure; middle area with protruding anterior margin; round, large and deep scars showing opaque punctuations; lobes of the mentum with punctures and setae mainly at the base. Ligula 3-toothed, medium tooth longer than lateral teeth; with large punctuations from which setae arise. Gula glabrous with small punctuations anteriorly. Labial palps with reduced proximal segments, middle segment longer and of same length as distal segment.

Thorax: Pronotum rectangular, same width as elytra, with few punctuations laterally, mostly associated with the lateral fossae. Very sparse pubescence formed by small setae mostly on the anterior and posterior border of the pronotum. Lateral pronotal groove not evident. Anterior pronotal groove well marked with strong punctures and extending up to just over 2/3 distance from lateral edge to median longitudinal groove. Anterior pronotal angles acute and conspicuous with very few setae on the ventral side. Longitudinal groove well defined and marked, extending for almost the entire length of the pronotum. Rhomboidal prosternum with narrow apex, glabrous, opaque and porous texture. Mesoesternum with well-defined groove, small, comma-shaped and matte. Mesepisternum glabrous, very marked by small punctuations. Very narrow lateral metaesternal grooves, no punctuation or pubescence, with rough texture. Smooth and glabrous sternal disc, delimited by a group of punctures in the posterior medial area.

Elytra: bright; shoulders glabrous. Striae narrower than the interstriae, marked with well-defined round punctuations in both the dorsal and the lateral striae. Epipleura glabrous.

Legs: Femur I with very reduced pubescence, being apparent only by two rows of fine setae in the dorsal and lateral side; anterior marginal groove well-marked and narrow. Tibia I with a spur and very few setae along the external margin; incomplete dorsal groove; seven reduced spines on the outer side. Tibia II with reduced pubescence, with two rows of small setae. Tibia II and III with two spines on the inner margin.

Abdomen: lateral groove not very marked, but very narrow and complete. Aedeagus in ventral view (Fig. 4) with basal piece fused to parameres, phallobase with a deep V-shaped notched in the medial region. Medial lobe large occupying almost half of the entire aedeagus with two longitudinal sclerotized plates located near the



Figures 1-6. *Passalus (Mitrorhinus) nodifer* sp. nov. **1.** Head and anterior region of pronotum, in dorsal view (scale 20 mm); **2.** Head in ventral view (scale 15 mm); **3.** *Habitus* dorsal view (scale 50 mm); **4.** Aedeagus in ventral view; **5.** Aedeagus in dorsal view; **6.** Aedeagus in lateral view (scales 10 mm).

edges, starting from the parameres and reaching the apex of the medial lobe (dorsal view Fig. 5). In lateral view (Fig. 6) the parameres are reduced, enlarged, and rounded at apex.

Examined Material: HOLOTYPE ♂: BRAZIL: Acre, Feijó, interflúvio Tarauacá/Envira 8°10'03.28"S 70°30'09.27"W, 05-11/xi/2011, Fernando Pinto & Gleic Sá col. (Coleção de Invertebrados do Instituto Nacional de

Pesquisas da Amazônia - INPA). PARATYPE 1♀: same data of Holotype, except, 8°30'20.98"S 70°02'41.43"W.

Geographical distribution: To date the geographical distribution of *P. nodifer* sp. nov., is restricted only to the type locality (Fig. 7).

Etymology: The specific epithet derives from the Latin "nodus" which means "knot" referring to its notorious secondary tubercle.



Figure 7. Map with the type locality of *Passalus (Mitrorhinus) nodifer* sp. nov.



DISCUSSION

Passalus (Mitrorhinus) nodifer sp. nov., is related to *Passalus spinifer* Percheron, 1841 because both have strong and high frontal ridges reaching the external tubercles, but in the case of *P. spinifer* Percheron, such ridges are sinuous, differing from *P. nodifer* sp. nov., by having straight front ridges. In addition, *P. spinifer* Percheron differ by having large, circular, deep and scored mesoesternal fossae; the metasternal disc is delimited by spaced punctuations not detached to the sides, while *P. nodifer* sp. nov., has smaller and narrower lateral metasternal fossae and the metasternal disc is well delimited by punctuations in the middle posterior region. It may also be closely related to *Passalus lunaris* Kaup, 1869, as both having mandibles with two terminal teeth and frontal ridges extending to the outer tubercles; however, *P. nodifer* sp. nov., has a shorter central tubercle and a non-free apex, low and sometimes inconspicuous parietal tubercles.

REMARKS

The subgenus *P. (Mitrorhinus)* Kaup as well as the other subgenera and sections of *Passalus* Fabricius are possibly not monophyletic in relation to genus, requiring urgent revision and phylogenetic studies in order to correctly

group the taxa as well as to define limits and degrees of kinship between the species. In the meantime, the great contrast in the number of *P. (Mitrorhinus)* Kaup species in comparison with other subgenera can be explained by the lack of taxonomic studies concerning the group.

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