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PASSALUS COARCTATUS PERCHERON, 1835 (COLEOPTERA: PASSALIDAE): REDESCRIPTION AND NEW DISTRIBUTIONAL RECORDS

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ABSTRACT. *Passalus (Passalus) coarctatus* Percheron, 1835 was described from Brazil without precise locality data; except for its inclusion in catalogues, nothing is known of this species and only one publication has provided specific locality data. We provide precise localities for *P. coarctatus* in Trinidad and Tobago, Venezuela, Brazil and Bolivia, we describe the third instar larva, discuss its taxonomic status and correct errors of previous publications.

Key words: Coleoptera, larval diagnosis, key to species, geographic distribution.

RESUMEN. *Passalus (Passalus) coarctatus* Percheron, 1835 fue descrita de Brasil sin datos precisos de localidad; exceptuando su inclusión en catálogos, no se conoce nada de esta especie y solo un trabajo publicado ha suministrado registros específicos de localidad. Proporcionamos localidades precisas para *P. coarctatus* en Trinidad y Tobago, Venezuela, Brasil y Bolivia, describimos la larva de tercer estadio, discutimos su estatus taxonómico y enmendamos errores de publicaciones anteriores.

Palabras Clave: Coleoptera, Passalidae, diagnosis larva, clave de especies, distribución geográfica.

INTRODUCTION

In the catalogue of Hincks and Dibb (1935: 56) *Passalus coarctatus* Percheron is included in Section III “Neleus” of the subgenus *Passalus* s. str., Brazil is noted as the country from which it was described and is considered a valid species as did Percheron (1841: 12), Luederwaldt (1931: 185), Blackwelder (1944) and Fonseca & Reyes-Castillo (2004). However, Burmeister (1847: 483) considered *P. coarctatus* synonymous with *P. coniferus* Eschscholtz, 1829, a synonymy accepted by Gemminger & Harold (1868) and Kaup (1871: 86). Nevertheless, Kuwert (1898: 271) designated it an aberration of *P. suturalis* Burmeister.

None of these authors added information to the original description, nor mentioned new key characters, precise localities or added figures of *P. coarctatus*, which suggests that they had not examined specimens. It seems like the interpretations of Burmeister (1847) and Lue-

derwaldt (1931) were based on the description and figure of Percheron (1835: 49-51 Pl. 3, fig. 7), while it is possible that Kuwert (1898) based his interpretation only on the figure. Jiménez-Ferbans *et al.* (2015) cited *P. coarctatus* from Trinidad and Tobago, providing a short diagnosis and commenting the similarity of this species with *P. unicornis* LePeletier & Serville, 1825. Recently, we found specimens coinciding with the original description of *P. coarctatus*. The purposes of this publication are to redescribe the adult and larva of *P. coarctatus*, provide precise new localities for the species, include a key for identifying it from related species and discuss nomenclatural aspects.

MATERIALS AND METHODS

The terminology employed is that of Boucher (2005) for the adult and that of Schuster & Reyes-Castillo (1981) for



the larva. The specimens are deposited in the following collections: Colección de Artrópodos de la Universidad del Valle de Guatemala, Guatemala (UVGC); Colección Entomológica del Instituto de Ecología A. C., México (IEXA); Insect Collection of The Field Museum of Chicago (FMNH), Instituto Nacional de Pesquisas da Amazonia (INPA) and Museo del Instituto de Zoología Agrícola Francisco Fernández Yépez, Universidad Central de Venezuela, Venezuela (MIZA). In the section on "Material examined", at the end of the collection data in parentheses is the number of specimens, occasionally the gender, and the acronym of the collection where deposited.

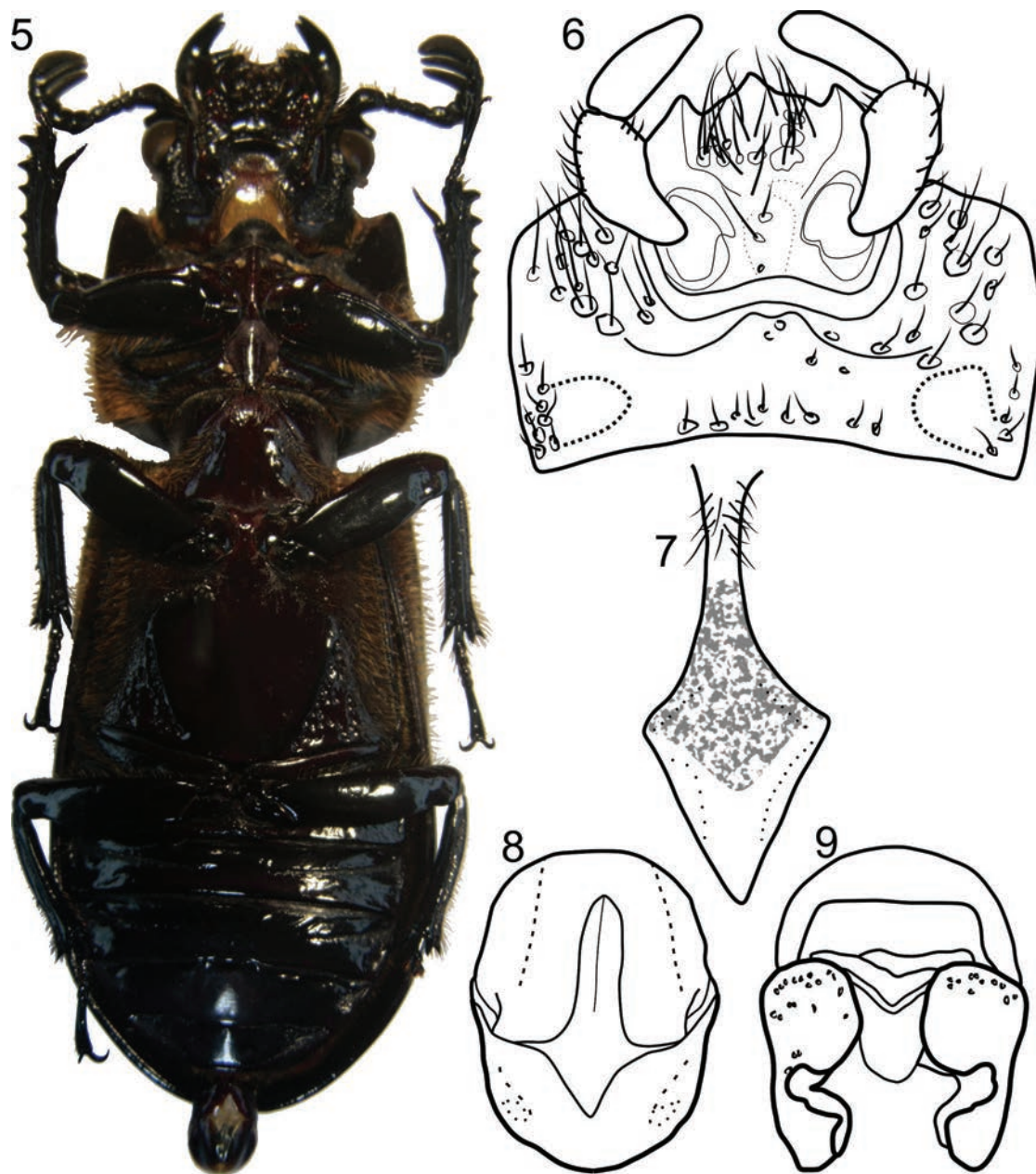
RESULTS

Passalus (Passalus) coarctatus Percheron, 1835 (Figs. 1, 5-9)

Diagnosis. 34.0-38.3 mm long. Clypeus hidden below the frons, with anterior angles developed. Secondary mediofrontal tubercles on anterior edge of frons separated by a distance less than the distance between them and the mediofrontal tubercles. Mediofrontal tubercles (MT) developed, on the outer side of the base of MT are located the internal tubercles, that are small. Central tubercle long, with free apex (Figure 1), reaching the anterior edge of



Figures 1-4. Head and pronotum, dorsal view. 1 *Passalus coarctatus*. 2 *P. coniferus*. 3 *P. interruptus*. 4 *P. unicornis*. Scale bars: 1 mm [Photos by L. Jiménez-Ferbans].



Figures 5-9. *Passalus coarctatus*. 5 Habitus, ventral view [Photo by L. Jiménez-Ferbans]. 6 Prementum and mentum, ventral view. 7 Proesternelum, ventral view. 8 Edeagus, ventral view. 9 Edeagus, dorsal view [modified from Upegui-Vélez 2008].

frons; postero-lateral tubercles large and marked. Antennal club with three elongated lamellae. Apex of lacinia bidentate. Median basal region of mentum pubescent and protruding (Fig. 6). Prosternal process rhomboidal. Pronotal arms shiny and pubescent. Mesosternum laterally pubescent (Fig. 5), with mesosternum scars well-defined and pubescent. Metasternum sides almost fully pubescent, including latera fossae; metasternal disc delimited

entirely by punctate area. Humeri fully pubescent; epipleura pubescent in basal 2/3.

Redescription. *Head* (Fig. 1): labrum with lateral edges slightly arched and frontal border concave. Anterior edge of frons with secondary mediofrontal tubercles and mediofrontal tubercles (MT) projected forward, both are of equal length; internal tubercles very marked, located close to MT. Central tubercle thick, sharpened forward,



slightly arched and reaching the anterior border of the head. Frontal area punctate on anterior third; laterofrontal tubercles slightly developed; frontal fossae punctate and glabrous; ocular canthus with scarce setae. Antennal club with three slender and elongated lamellae (Fig. 6). Mentum with lateral fossae glabrous, deep and sub-circular (Fig. 6); median basal region of mentum protruding and pubescent on posterior part.

Thorax. Pronotum quadrangular, glabrous, with anterior angles slightly acute and sides with scarce punctures close to lateral fossae; marginal groove narrow on anterior margin, occupying 1/3 of pronotum anterior border. Prosternal process rhomboidal, with apex shiny (Fig. 7). Mesosternum punctuate and pubescent laterally; mesosternum scar oval well-defined, punctuate and densely pubescent. Posterior angle of mesepisternum and mesepimeron pubescent. Metasternal disc fully delimited by punctate area. Lateroanterior metasternum punctate and pubescent. Metasternal fossae pubescent, wider than tibiae II.

Elytra. Shiny, anterior border rectangular and pubescent; humeri fully pubescent; epipleura pubescent until the level of the first abdominal tergite; elytral striae with marked rounded punctures in lateral striae and weak rounded punctures in dorsal striae.

Legs. Anterior ventral border of profemur with pronounced and complete groove; tibia I with dorsal groove; tibiae II with a small lateral spine, and tibiae III without lateral spines.

Aedeagus (Figures 8-9). In ventral view, basal piece fully fused to parameres; lateral lobes fused in V-shape; median lobe strongly sclerotized, globose, being 2/3 of total length of aedeagus.

Redescription of the third instar larva. 1 specimen. TRINIDAD: Arima Valley, 580 m alt., 19 XII 81, JC Schuster, 1 III 6.3, #TT-18 (identified as *Passalus unicornis* Lepelletier et Serville by Schuster 1982). It possesses the typical setal pattern of Passalini and of the subgenus *Passalus* section "*Neleus*" (see Schuster & Reyes-Castillo 1981), lacking the lateral shield setae of the pronotum, the lateral mesonotal setae, the lateral metanotal setae and all the abdominal setae save in the ninth sternite which presents one abdominal seta. The internal coxae have only one seta. Two medial tergal setae and two submedial tergal setae are on sternites 1-9. The anal ring on segment 10 is composed of ten setae.

Material examined. 27 adults and one larva. BOLIVIA: Beni Prov.; VII-26-VIII-4-1960; leg. B. Malkin// Chacobo Indian Village on Rio Benicito 66°-12° 20' // *Passalus*

(*P.*) *coniferus* Eschsch. Det: J. Schuster 2001 // *Passalus* (*Passalus*) *coarctatus* Percheron Det.: Jiménez-Ferbans, 2015 (1 FMNH). Santa Cruz, 5 km SSE Buena Vista, Hotel Flora y Fauna, 11.ii.2007, CW LB O'Brien (1 UVGC). BRASIL: Acre: Manoel Urbano, Ramal 1, Sr. Altemiro, 8°54'29,7" S, 69°15'12,1"W / 27-30.IX.2010, CRV Fonseca, FBP Gouveia, José Vicente e Plinio (INPA)/ *P. coniferus*/ *Passalus* (*Passalus*) *coarctatus* Percheron Det.: Jiménez-Ferbans, 2013 (1 INPA); Ramal 2, Ramal do km 20 9°0'9,2" S, 68°49'15,7"W / 27-30.IX.2010, CRV Fonseca, FBP Gouveia, José Vicente e Plinio (INPA)/ *P. unicornis*/ *Passalus* (*Passalus*) *coarctatus* Percheron Det.: Jiménez-Ferbans, 2013 (2 INPA). TRINIDAD AND TOBAGO: Trinidad: Anima Valley, Log 7' dia., 580 m, 19.XII.1981, J.C. Schuster. *Passalus unicornis*// *Passalus* (*Passalus*) *coarctatus* Percheron, 1835 Det.: Jiménez-Ferbans, 2012 (2♀, larva III UVGC); St. Andrew County, 2,5 mi. E of Valencia, ex. Large (very hard) logs on ground, 27.III.1987, coll. P. Hunter, W.T. Atyeo, *Passalus* (*Passalus*) *unicornis* Lep. et Serv. Reyes-Castillo, det. 87 // *Passalus* (*Passalus*) *coarctatus* Percheron, 1835 Det.: Jiménez-Ferbans, 2012 (1♀, 1♂ IEXA); George County mountains, 7 mi. N Port of Spain, ex decaying log, 26.III.1987, coll: P. Hunter, W.T. Atyeo. *Passalus* (*Passalus*) *unicornis* Lep. et Serv. Reyes-Castillo, det. 87 // *Passalus* (*Passalus*) *coarctatus* Percheron, 1835 Det.: Jiménez-Ferbans, 2012 (2♀, 2♂ IEXA). VENEZUELA: Bolívar: El Bochinche, R. Forestal Imataca, 200 m, 6-13-XII-1974, Expedición Instituto Zoología Agrícola-Fac. Agronomía-UCV, (2 MIZA). Carret. El Dorado - Sta Elena, Km 88, 100 m, 26-IX-1967, L. J. Joly, (2 MIZA); same data as anterior, Joly & Ramírez (5 MIZA). El Dorado Santa Elena Km 38, 160m, 31-VIII-1957, F. Fernández Y. & C. J. Rosales (1 MIZA); same data as anterior, 23-VIII-1957 (1 MIZA). Carret. El Dorado - Sta Elena, Km 88, 100 m, 28-IX-1967, J. L. García, Joly & Ramírez/ det. *Passalus unicornis* (4 MIZA).

Distribution. Bolivia, Brasil, Venezuela (Upegui Vélez, 2008), and Trinidad and Tobago.

Key to *Passalus* (*Passalus*) *coarctatus* and related species (In part Upegui Vélez, 2008)

1. Mesosternal fossa pubescent. 2
- Mesosternal fossa glabrous or with only 1-3 setae. . . . 3
2. Central tubercle with apex very free, reaching the anterior cephalic border (Figure 1) (length 33-38 mm). *Passalus coarctatus* Percheron
- Central tubercle with apex not free or barely free (Figure 2) (length 34-39 mm) . . . *Passalus coniferus* Eschscholtz

3. Marginal groove of last abdominal sternite incomplete. Large (length 44-50 mm) (Figure 3)..... *Passalus interruptus* (Linnaeus)
 - Marginal groove of last abdominal sternite complete. Medium to large body..... 4
4. Pronotum pubescent on lateral fossa. Elytral striae 8-10 pubescent on total length (36-45 mm) (Figure 4)..... *Passalus unicornis* LePeletier & Serville
 - Pronotum glabrous on lateral fossa. Stria 10 pubescent only on basal third..... 5
5. Central tubercle with apex free, curved upward in lateral view (29–32 mm).*Passalus elfriedae* Luederwaldt
 - Central tubercle with apex free and not curved upward in lateral view*Passalus suturalis* Burmeister

DISCUSSION

In Burmeister (1847), where he considers *P. coarctatus* synonymous with *P. coniferus*, the author doesn't really discuss this decision nor mention the large central tubercle that distinguishes *P. coarctatus*. Percheron (1835), on describing the species, indicates that the central tubercle is exceptionally long; nevertheless, in the figure he cites, the tubercle is barely free. Probably this motivated his idea that *P. coarctatus* was a synonym of *P. coniferus*, criterion followed by Kaup (1871), who indicated that a variation existed within *P. coniferus* with respect to the length of the central tubercle. This variation was presumably due to Kaup's consideration of *P. coarctatus*, with a long, free tubercle, synonymous with *P. coniferus*, that has a shorter, reduced tubercle.

Burmeister (1847) synonymy is also followed in the catalogue of Gemminger & Harold (1868), but they probably did not examine specimens and only accepted the proposal of Burmeister. Kuwert (1898), however, included it as an aberration of *Passalus suturalis* Burmeister, 1847. Nevertheless, Hincks & Dibb (1935) indicate that *Passalus suturalis* sensu Kuwert is, in reality, a synonym of *P. punctiger* and recognized *P. coarctatus* as a valid entity, as did Luederwaldt (1931), which was similar to *P. elfriedae*. It is probable that the confusion concerning the status of *P. coarctatus* is due to, apart from the type series, no other specimens of this species were known and none of the authors mentioned clearly states that they had examined specimens. Instead, Figure 1 contrasts the morphology of the head of *P. coarctatus* with other species of *Passalus*; it is without doubt that it is a separate species, easily recognized by its long horn and poorly raised dor-

sal ridges. For these reasons, the synonymies proposed for *P. coarctatus* should not be accepted.

Passalus coarctatus presents a distribution to the north and center of South America, in the Guyana-Amazon shield, although its range will probably expand to others countries (v.g. Colombia) when misidentified material from other collections is examined. In fact, almost all the specimens we examined were determined as *Passalus unicornis*, a species that also possesses a long horn. In *P. unicornis* the mentum and the mesosternal scars are glabrous and elytral striae 8-10 are pubescent to their ends, characters which differentiate it from *P. coarctatus*.

Also, Schuster (1992) cited the same larva that we examined, assuming it to be *P. unicornis*, determination hereby corrected: the larva corresponding to *P. unicornis* in Schuster (1992) is an instar II; the instar III larva mentioned is, in reality, *P. coarctatus*.

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