

Description of a remarkable new *Phalacrichus* SHARP, 1902 from Paraguay (Coleoptera: Limmichidae: Limmichinae)

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Abstract

A new species of the genus *Phalacrichus* SHARP, 1902 (Coleoptera: Limmichidae: Limmichinae) is described from Paraguay: *P. monday* sp.n. The new species is characterized by the unique denticulate lateral pronotal margins. The habitus and diagnostically important morphological details are depicted by color photographs and SEM micrographs.

Key words: Coleoptera, Limmichidae, Limmichinae, *Phalacrichus*, new species, Paraguay, South America.

Introduction

The genus *Phalacrichus* was described by SHARP (1902) for *P. atomarius* SHARP, 1902 from Central America. WOOLDRIDGE (1982) transferred to this genus two species described by PIC (1923, 1938) under *Byrrhinus* MOTSCHULSKY, 1858 and *Eulimmichus* CASEY, 1889, and described eight new species, all from the New World (from Mexico to Argentina).

Subsequently, WOOLDRIDGE (1993) described an additional species from Venezuela, RIBERA & HERNANDO (2001) another one from Peru, and HERNANDO & RIBERA (2003) a third one from Brazil.

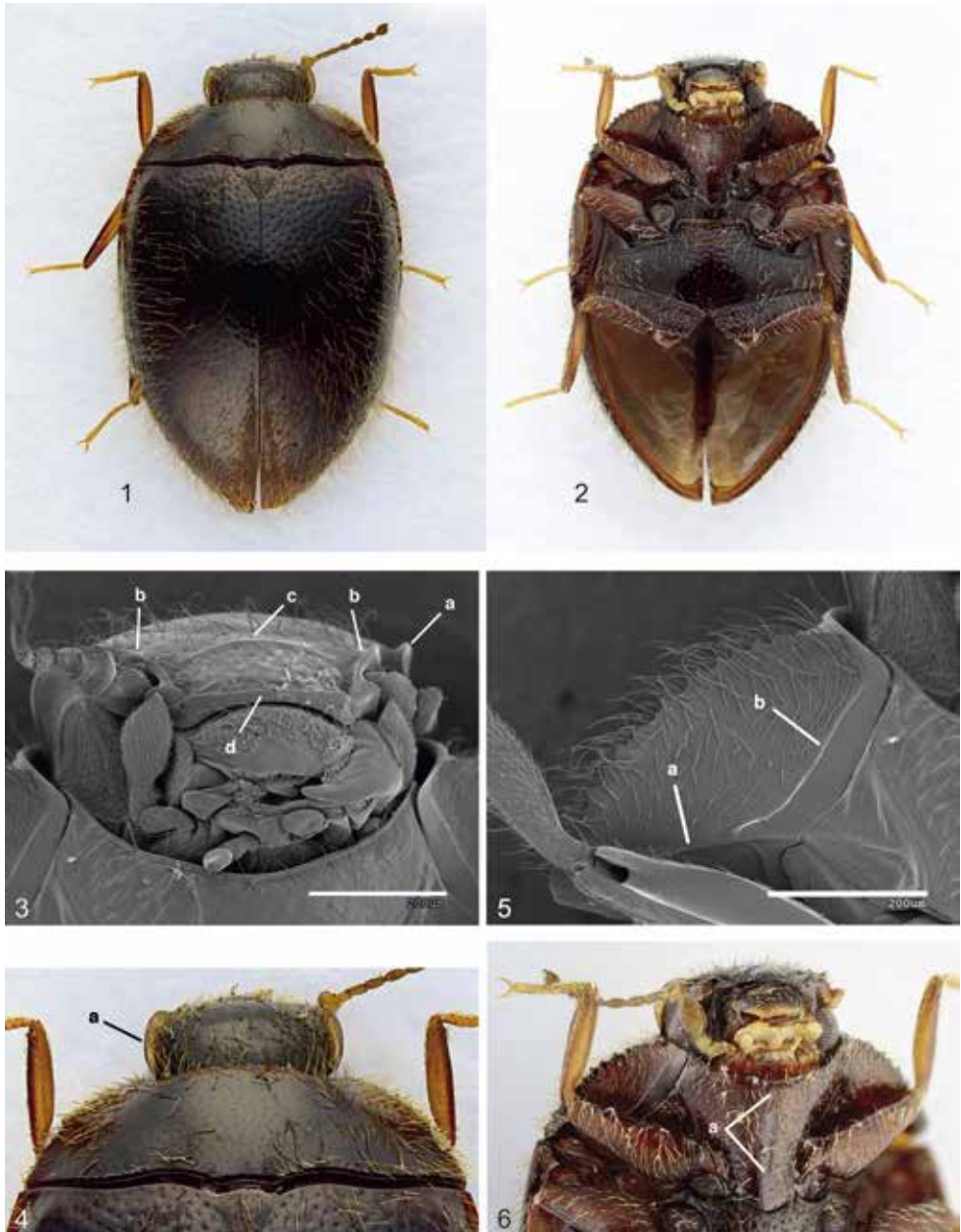
Here, we describe another new species from Paraguay, which deviates from all known species of the genus by its denticulate lateral pronotal margins.

Material and methods

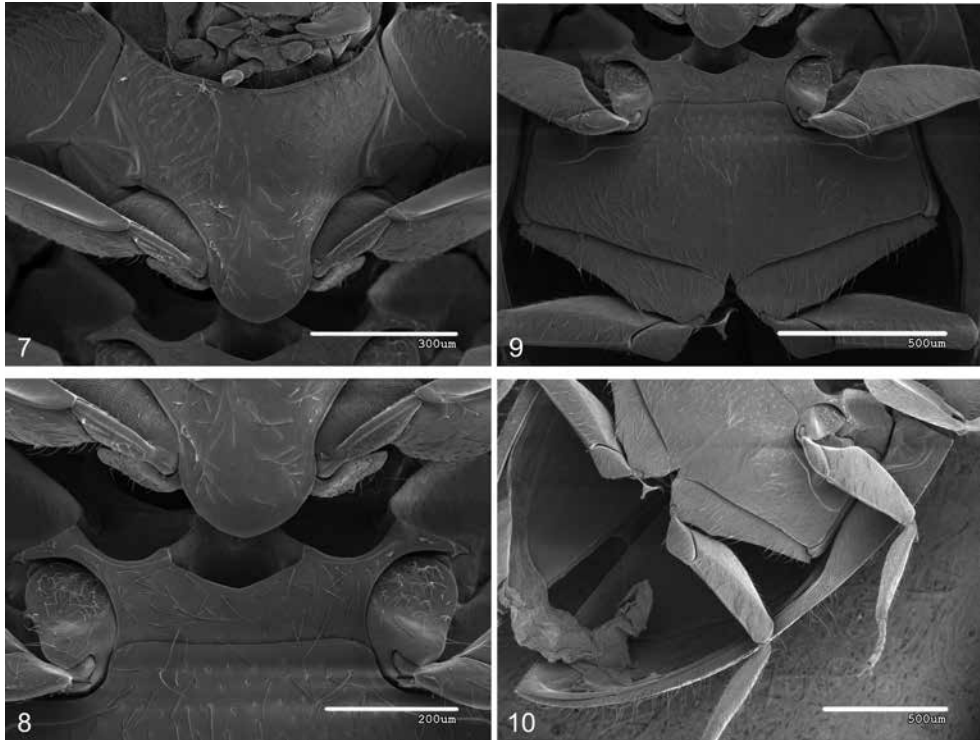
Dissections were made using standard techniques. Genitalia were dissected from the abdomens of specimens previously softened in boiling water for 10 minutes. Contents of the abdomen were cleared using boiling 10% KOH for 2–3 minutes to remove internal tissues, and then washed in hot water before examination. After examination, genitalia were mounted on transparent plastic cards in dimethyl hydantoin formaldehyde resin (DMHF) and pinned beneath the specimen. Specimens were studied with a Leica M125 C stereomicroscope (Leica Microsystems, Wetzlar, Germany). Habitus images were taken using a Canon EOS 50D digital camera with attached Canon MP-E 65mm f/2.8 1–5 macro lens (Canon Inc., Tokyo, Japan). Male and female genitalia and sternites were photographed using a Canon EOS 50D digital camera attached to a Zeiss Axiostar plus compound microscope (Carl Zeiss AG, Oberkochen, Germany). Serial images were stacked with Zerene Stacker software (Zerene Systems, Richland, USA). For SEM observation one specimen was mounted on a stub with double-sided carbon conductive tab and coated with gold in a Quorum Q150R S sputter coater unit (Quorum Technologies Ltd., UK). The sample was observed using a Hitachi S3500N scanning electron microscope (Hitachi High-Technologies Co. Ltd., Japan) operated at 4 kV in the Electron Microscopy Service of the Institute of Marine Sciences (CSIC), in Barcelona (Catalonia, Spain).

All specimens examined are deposited in the following collections:

CHB Coll. Carles Hernando, Badalona, Catalonia, Spain
NMW Naturhistorisches Museum Wien, Austria



Figs. 1–6: *Phalacrichus monday*; 1–2) habitus of holotype, in dorsal and ventral view; 3) head, frontal view, a) supraorbital carinae, b) supraantennal carina, c) stria frontal, d) anterior margin of the clypeus; 4) head and pronotum in dorsal view, a) supraorbital carinae; 5) hypomeron and lateral margin of pronotum, a) oblique stria of hypomeron, b) longitudinal stria of hypomeron; 6) intercoxal process of prosternum, a) median longitudinal sulcus.



Figs. 7–10: *Phalacrichus monday*; 7) prosternum, ventral view; 8) mesoventrite, ventral view; 9) meta-ventrite, ventral view; 10) metathorax and elytra, ventral view.

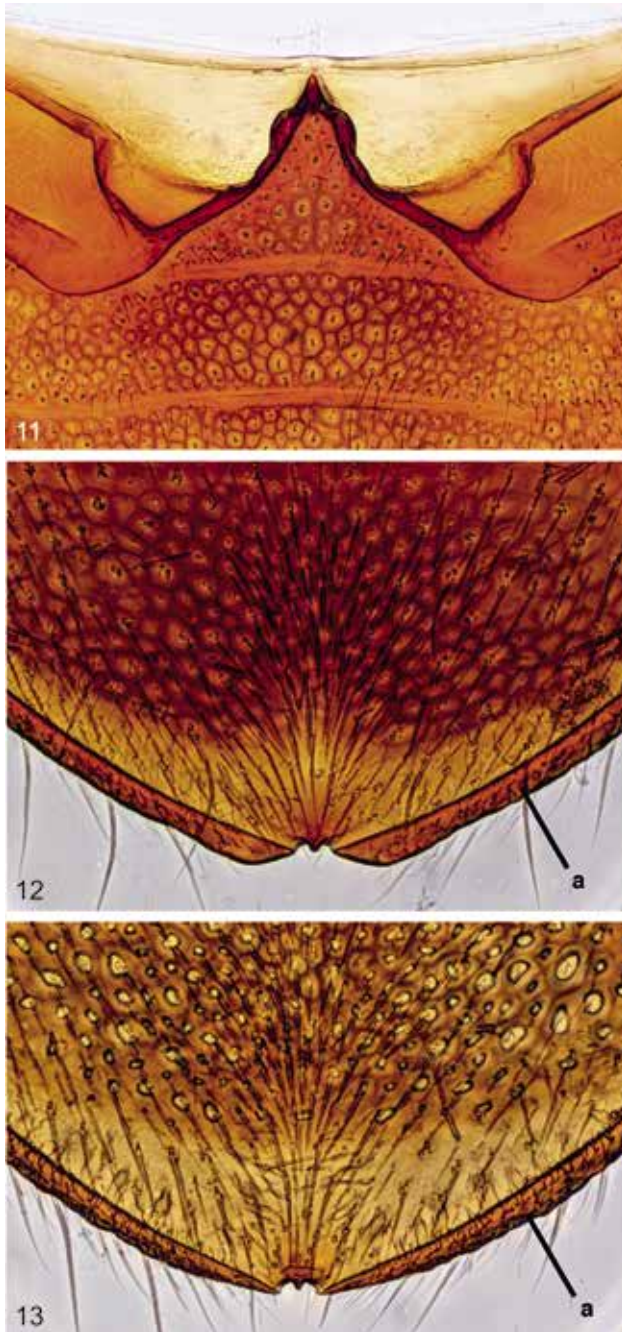
***Phalacrichus monday* sp.n.**

TYPE LOCALITY: Monday River, ca. 2 km above waterfall (“Saltos del Monday”), Presidente Franco District, Alto Paraná Department, Paraguay.

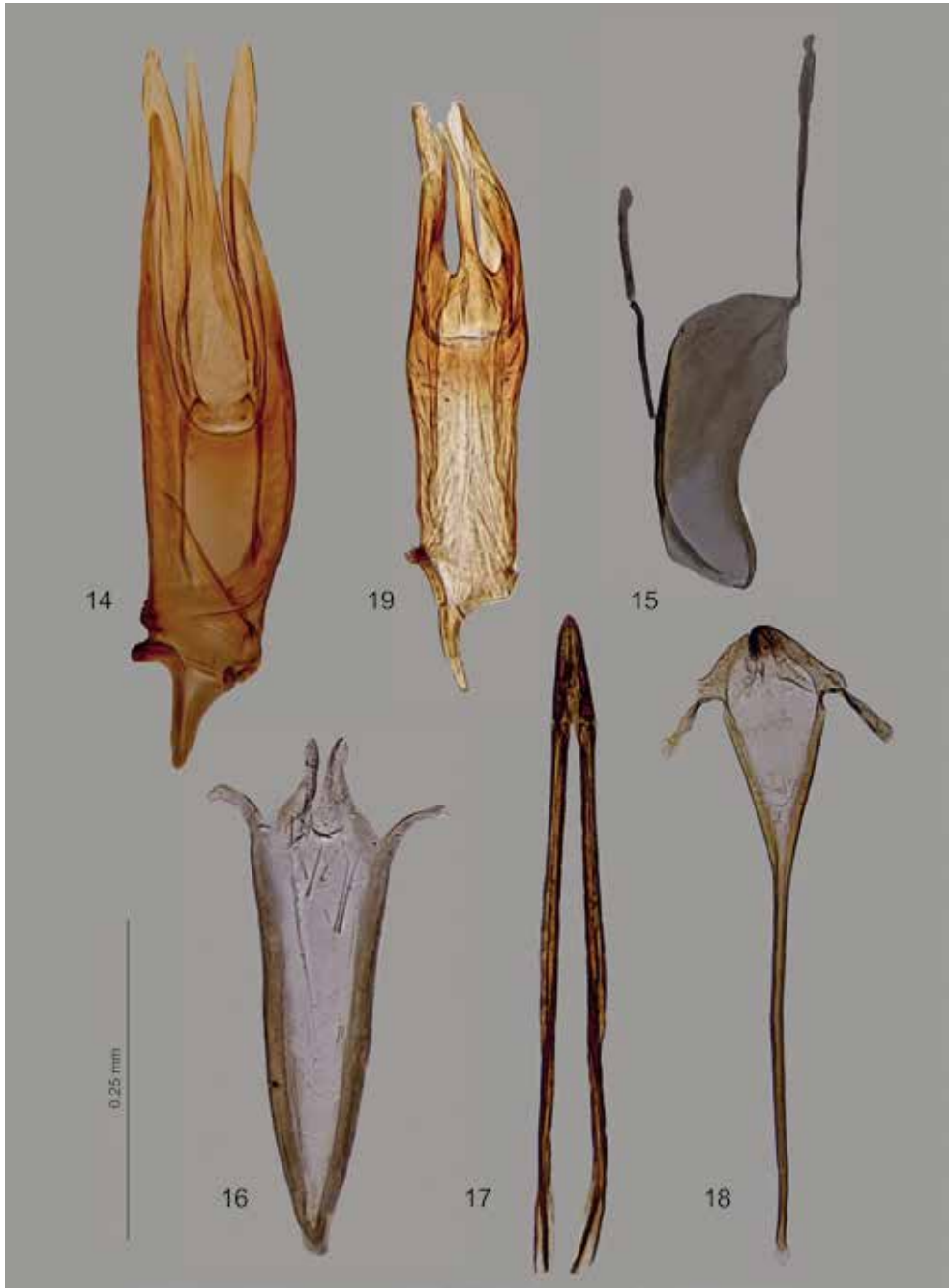
TYPE MATERIAL: **Holotype** ♂ (NMW): “PARAGUAY \ Dep. Alto Parana, Río \ Monday, oberhalb Wasserfall [above waterfall] \ S25°34,7' W54°38,3' \ 16.-23.I.2003, Drechsel leg.”. **Paratypes:** 3 ♀♀ (NMW: 2, CHB: 1): same locality data as holotype.

DESCRIPTION: 1.9 mm long (head included), 1.3 mm wide. Body shape broadly oval, convex. Body color dark brown, legs and head appendages slightly paler. Dorsal surface covered by golden erect pubescence (Figs. 1–2).

Head partially retracted into pronotum; with two strong supraorbital carinae running up to the insertion of the antenna (Figs. 3–4), supraantennal carina well marked (Fig. 3); frontal stria well impressed, complete and slightly elevated (Fig. 3); anterior margin of clypeus strongly bordered (Fig. 3). Punctures small, slightly impressed, close on front, becoming more distant on vertex but nearly equal in size throughout, punctuation of clypeus more dense and impressed; surface between punctures smooth and shiny; pubescence long and erect, more dense on frons and clypeus. Eyes well developed, not prominent, covered by the supraorbital carinae when observed from above (Figs. 3–4). Antenna: first two segments globular, robust, subequal; segments 3 and 4 cylindrical and very short; 5–11 moniliform, asymmetrical.



Figs. 11–13: *Phalacrichus monday*; 11) first ventrite, intercoxal process; 12–13) last abdominal ventrite, ventral view, showing abdominal/elytral interlocking device (a), 12) male, 13) female.



Figs. 14–19: *Phalacrichus monday* (14–18) and *P. elongatus* (19); 14) aedeagus, ventral view, 15) male genital segment, ventral view, 16) male sternite VIII, 17) gonocoxites and gonocoxal struts, ventral view, 18) spiculum, 19) aedeagus, ventral view.

Pronotum transverse (Fig. 4); lateral margins strongly denticulate (Fig. 5). Posterior margin slightly bisinuate and not crenulate, anterior margin with a series (matching the width of the head) of well separated digitiform expansions, each with a seta. Punctures small, slightly impressed. Surface smooth and shiny, without transverse series of small tubercles (Fig. 4). Pubescence long and erect on the entire surface.

Elytra oval, convex (Fig. 1); lateral margin strongly bordered. Punctures distinctly impressed, particularly on disc and around scutellum, regular, more marked than on pronotum. Surface smooth and shiny. Pubescence long and erect on all the surface (Fig. 1). Scutellum longer than wide, triangular and with a few very fine punctures. Hind wings well developed.

Ventral surface covered with a long recumbent pubescence (Fig. 2). Hypomerone with two striae: one oblique stria separating the flat and pubescent anterior surface from larger posterior crural impression (Fig. 5), and the longitudinal stria separating a smooth and shiny fringe (in contact with the mesoventrite) from the anterior flat and pubescent surface (Fig. 5). Intercoxal process of prosternum with an almost imperceptible median longitudinal sulcus (Fig. 6); apex rounded, lateral margins finely bordered, except at apex (Fig. 7). Mesoventrite narrow, covered with sparse, slightly impressed punctation; with a slightly marked, median longitudinal line and a large excavation for insertion of prosternal intercoxal process and procoxae (Fig. 8). Meta-ventrite convex, as long as mesoventrite; surface of metaventrte covered with distinctly impressed punctures, particularly on disc, with a longitudinal stria not reaching the anterior margin, surface between punctures smooth and shiny (Fig. 9). Epipleura deeply impressed to receive the femoral tips (Fig. 10).

First abdominal ventrite with depressions for reception of metafemora and metatibiae; intercoxal process of the first abdominal ventrite triangular, pointed, with sinuate lateral lines (Fig. 11). Surface of abdominal ventrites with dense and uniform, strong punctation. First three ventrites connate, surface between punctures with polygonal reticulation. Apical abdominal ventrite emarginate, with a blunt median protuberance and covered with long recumbent setae (Figs. 12–13).

Legs pubescent, short and robust. Tibiae sulcate for the reception of the femora.

Male: Abdominal/elytral interlocking device of apical ventrite parallel-sided and obliquely truncate at apex (Fig. 12). Aedeagus articulated, elongate, with asymmetrical base. Parameres symmetrical and elongate, apices pointed (Fig. 14). Median lobe shorter than parameres, apex acuminate; struts slightly asymmetrical, shorter than median lobe. Pseudoparameres (laminar extensions of phallobase covering parameres ventrally) strongly asymmetrical (right pseudoparamere shorter than left one). Phallobase with a strong basal lateral notch (Fig. 14). Basal piece of ninth genital segment spatulate, asymmetrical, margins slightly sclerotized; apex broad, membranous, with a spaced series of sensory microsetae on distal margin (Fig. 15); parameres of the 9th genital segment very long; articulated asymmetrically with basal piece, right paramere articulated at apex, left paramere in the middle part of the lateral margin (Fig. 15). Eighth sternite V-shaped (Fig. 16).

Female: Abdominal/elytral interlocking device of apical ventrite tapering towards apex (Fig. 13). Ovipositor in dorsal view as in Fig. 17, gonocoxal struts very long, five times the length of gonocoxites, which are strongly acuminate, articulate at apex of gonocoxal struts. Spiculum ventrale with a long manubrium, distal plaque with two long lateral expansions (Fig. 18).

DIFFERENTIAL DIAGNOSIS: The new species is easily distinguished from all known species of the genus by the presence of strong denticles on the lateral pronotal margins (Fig. 5). Other important external characters are the lack of transverse series of small tubercles on the pronotum (Fig. 4), a character which is absent only in the widely distributed *P. elongatus* (PIC, 1923), but in the latter species, the body shape is more elongate and parallel-sided (broadly oval in *P. mondayi*); the posterior margin of the pronotum of *P. elongatus* is crenulate (smooth in *P. mondayi*);

the prosternal intercoxal process of *P. elongatus* lacks the longitudinal median sulcus; the aedeagus of *P. elongatus* is clearly different, with short and symmetrical pseudoparameres (Fig. 19) (this structure was not depicted in WOOLDRIDGE 1982: fig. 3), verified with specimens from different localities, while the pseudoparameres of *P. monday* are long and asymmetrical (Fig. 14).

Based on the aedeagus, *P. monday* seems close to *P. atomarius*, *P. durus* WOOLDRIDGE, 1982 and *P. latus* WOOLDRIDGE, 1982 (see WOOLDRIDGE 1982).

HABITAT: According to the label data, it can be assumed that the new species was found at a river margin.

ETYMOLOGY: The epithet refers to Monday River, famous for its spectacular waterfall (“Saltos del Monday”).

DISTRIBUTION: So far known only from the type locality.

Acknowledgements

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