Zootaxa 4755 (1): 099–128
https://www.mapress.com/j/zt/
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Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

https://doi.org/10.11646/zootaxa.4755.1.4
http://zoobank.org/urn:lsid:zoobank.org:pub:53E41147-52AA-4A16-BB69-3A9279A303AF

Hiding in plain sight: rediscovery and review of *Parygrus* Erichson, 1847, with description of five new species from the Neotropics (Coleoptera: Byrrhoidea: Dryopidae)

CHERYL B. BARR[1] & WILLIAM D. SHEPARD[2]
[1,2]Essig Museum of Entomology, 1101 Valley Life Sciences Bldg., #4780, University of California, Berkeley, CA 94720, USA.
[1]ORCID: 0000-0001-6707-4301.
[2]ORCID: 0000-0003-4664-2597. E-mail: william.shepard@csus.edu
[1]Corresponding author. E-mail: cbarr@berkeley.edu

Abstract

The history and original concept of *Parygrus* Erichson, 1847, is reviewed, the genus is redescribed, and the status of the type species, *P. erichsoni* Waterhouse, 1876, is clarified. The four original species are reviewed, with photographs provided for the type specimens of *P. angustatus* Grouvelle, 1896, *P. elateroides* Grouvelle, 1896, and *P. erichsoni*, and a non-type of *P. parallelus* (Grouvelle, 1890). The holotype of *P. parallelus* is apparently missing. The female holotype of *P. erichsoni* is redescribed. An associated male *P. erichsoni* specimen is compared with the holotype and the male genitalia are described and illustrated. General descriptions and provisional diagnoses are given for *P. angustatus*, *P. elateroides* and *P. parallelus*. Five new species (*P. guarani* **new species**, *P. lengua* **new species**, *P. maya* **new species,** *P. quechua* **new species,** *P. zamuco* **new species**) are proposed, illustrated, and their geographic distributions mapped. For the first time, the male genitalia of *Parygrus* species are described and illustrated. A provisional key to the species and an updated key to the Neotropical genera of Dryopidae are provided.

Key words: taxonomy, long-toed water beetle, Mexico, Central America, South America, semiaquatic beetles

Introduction

The Neotropics are home to 14 genera and 68 described species of Dryopidae. Of these genera, the most poorly known is *Parygrus* Erichson, 1847. Four species of *Parygrus* have been described from South America: *P. erichsoni* Waterhouse, 1876, from Colombia, and *P. parallelus* (Grouvelle, 1890), *P. angustatus* Grouvelle, 1896, and *P. elateroides* Grouvelle, 1896, from Brazil. No species have been described in nearly 125 years, and there has been no further mention of the species in the literature since their listing in the Coleoptera catalogs of Zaitzev (1910) and Blackwelder (1944). *Parygrus erichsoni* was excluded from Blackwelder's Western Hemisphere catalog, probably because Zaitzev (1910) assigned the species to *Pachyparnus* Fairmaire and erroneously stated its origin as "Ceylon."

Hinton (1936) relegated *Parygrus* to synonymy under *Helichus* Erichson, 1847, along with *Pachyparnus*, after examining the three Grouvelle types. In addition, Hinton stated that *Parygrus* was "stillborn" because Erichson had assigned no species when he erected the genus. Brown (1970) cited Hinton (1936) in his paper on the New World dryopid genera and omitted the genus from his key, as did Passos *et al*. (2018) from their key. Kodada *et al*. (2016), however, included *Parygrus* in their list of dryopid genera.

Quite some time ago Spangler (1980) and Nelson (1989) stated the need for a revision of *Helichus* due to the accumulation of a large number of species, many of which apparently belong to undescribed genera. The taxonomic concept of *Helichus* has changed considerably over time since Erichson's description in 1847 (Shepard and Barr 2018). Although several new genera have been erected for species originally placed in the genus by other authors (*e.g.*, *Parahelichus* Bollow, 1940, *Praehelichus* Bollow, 1940, *Postelichus* Nelson, 1989, *Platyparnus* Shepard and Barr, 2018, *Microparnus* Shepard, 2019), and *Parygrus* and *Pachyparnus* are now recognized as valid genera (Kodada *et al.* 2016), a generic revision of *Helichus* is still lacking.

Accepted by F. Čiampor: 14 Jan. 2020; published: 23 Mar. 2020

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In the early 1990s we collected a series of dryopid beetles from a water-filled roadside ditch on Isla de Cozumel, Quintana Roo, Mexico (Fig. 1). The sample was a mix of *Pelonomus* Erichson and a genus unknown to us. In Brown (1970), the mystery specimens keyed to *Helichus* (because *Parygrus* was excluded from his key). However, the specimens differed considerably from the current understanding of *Helichus* so we initially assumed they represented an undescribed genus. It was only when we saw photographs of the type of *Parygrus erichsoni* housed at the Natural History Museum in London (Fig. 5) that we realized our specimens must belong to the genus *Parygrus*. We have since found several other undescribed species of *Parygrus* in various museums and among specimens we obtained from other collectors.

In this article we redescribe the genus *Parygrus* and the type species *P. erichsoni*, and describe five new species. The remaining three original species from the Grouvelle Collection were not available for loan, but they are tentatively diagnosed and discussed based on photographic images and the original descriptions, and are included in the species key and distribution maps.

FIGURE 1. Type locality of *Parygrus maya* **n. sp.** on Isla de Cozumel, Quintana Roo, Mexico.

Material and methods

The specimens from Isla de Cozumel, Mexico, were collected by sweeping a D-frame aquatic net through shallow, lentic, vegetation-choked, roadside pools (Fig. 1). The specimens from Belize and Panama were taken at mercury vapor and/or blacklights near lentic habitats. The beetles were preserved in the field with 75% ethanol, and prepared later in the laboratory. Additional specimens were obtained from other collectors or through loans from entomological museums and collections.

Museum and collection abbreviations:

CASC	California Academy of Sciences, San Francisco, CA, USA
CSCA	California State Collection of Arthropods, California Department of Food and Agriculture, Sacramento, CA, USA

EMEC	Essig Museum of Entomology, University of California, Berkeley, CA, USA
FSCA	Florida State Collection of Arthropods, Gainesville, FL, USA
LSAM	Louisiana State Arthropod Museum, Louisiana State University, Baton Rouge, LA, USA
MNHN	Muséum National d' Histoire Naturelle, Paris, France
NHMUK	Natural History Museum, London, UK
STRI	Smithsonian Tropical Research Institute, Balboa, Panama
UMC	Enns Entomology Museum, University of Missouri, Columbia, MO, USA
UNAM	Universidad Autónoma de México, Mexico City, Mexico
USNM	United States National Museum of Natural History, Washington, D.C., USA

A Leica MZ 12.5 stereo microscope fitted with an ocular micrometer was used for examination and measurement of specimens. Genitalia from selected male specimens were dissected, examined, placed in genitalia vials containing a drop of glycerin, and mounted beneath the card point-mounted specimens. Specimens on loan were relaxed in warm water, the genitalia extracted as above, and the specimens remounted. Measurements of total body length represent the length of the pronotum plus the length of the elytra, excluding the head and the variable space between the pronotum and elytra, unless the measurement was taken from the original description of one of the four original species; measurements of body width include both elytra at their widest point.

The redescription of *P. erichsoni* was based on examination of the female holotype, and the male genitalia were described from an associated male specimen. Since we were unable to examine the types of *P. angustatus, P. elateroides* and *P. parallelus*, they were not redescribed. Instead, *P. angustatus and P. elateroides* were diagnosed and discussed based on photographic images of the types in conjunction with the original descriptions. The holotype of *P. parallelus* is apparently missing, so its treatment was based on non-type images and the original description.

A Visionary Digital BK Plus Lab System fitted with a Canon EOS 7D camera was used for the habitus images of the new species; a Syncroscopy AutoMontage ® system was used for the genitalia images of the same. Photographs of the holotype of *Parygrus erichsoni* Waterhouse and a companion specimen were provided by the Natural History Museum, London, UK; photographs of the holotypes of *P. angustatus* and *P. elateroides*, and Grouvelle specimens of *P. parallelus*, were provided by the Muséum National d'Histoire Naturelle, Paris, France.

Label data from the specimen labels are reported verbatim: "/" indicates the end of a line on one label, and "//" indicates a subsequent label; error corrections or additions for clarity, not found on the label, are included within brackets "[ ]". Abbreviations used are: M for male, F for female.

The distribution maps were produced using the free online program, SimpleMappr (Shorthouse, D. P., 2010).

Generic Treatment

Genus *Parygrus* Erichson, 1847

Type species. *Parygrus erichsoni* **Waterhouse, 1876; designated by subsequent monotypy.**

Diagnosis. *Parygrus* shares antennal morphology with *Helichus*, but the two genera can be separated by the following characters: *Parygrus* is very pubescent, covered with erect and semi-erect setae, including the eyes; plastron setae are not present; the enlarged 2nd antennomere covers antennomeres 3–4 or 3–5. *Helichus* is covered with recumbent plastron setae and lacks erect setae, the eyes are bare; the enlarged 2nd antennomere covers all of the distal antennomeres. Because of its pubescence, *Parygrus* appears most similar to *Pelonomus*, *Microparnus*, *Onopelmus* Spangler, *Dryops* Olivier and *Platyparnus*. These genera differ from *Parygrus* by the following: *Pelonomus* does not have an enlarged 2nd antennomere; *Microparnus* has 10 antennomeres and *Onopelmus* has 13; *Dryops* and *Platyparnus* have pronotal sublateral carinae/sulci.

Generic redescription. Size from 4–8 mm long; elongate, parallel-sided or somewhat wider at posterior 1/3, moderately convex in lateral view; color uniformly brown; very setose, covered with long, stout, erect and/or semi-erect setae and shorter, finer, recumbent setae.

Head covered with erect setae; frons projecting slightly or prominently forward between antennal bases; vertex flattened or shallowly depressed between eyes. Eyes hemispherical, protuberant, covered with erect setae, finely faceted. Antennae densely setose, pectinate, with 11 antennomeres; antennomere 2 enlarged, trapezoid, covering antennomeres 3–5 or 3–6; antennomere 3 shortest; antennomeres 4–11 forming a loose club; subantennal grooves deep below eyes; insertions approximate. Clypeus sub-triangular, wider than long. Labrum transverse, shorter than clypeus. Mandible with four teeth; ventral two teeth larger, acutely pointed; dorsal two teeth smaller, blunt, closely appressed. Maxillary palpi each with four palpomeres; labial palpi each with three palpomeres.

Pronotum wider (~1.25x) than long; narrowly marginate and sometimes explanate laterally; anterior angles very acute; posterior angles barely acute, depressed; carinae absent, disc slightly flattened; punctate with large, distinct punctures interspersed with very small, fine punctures. Hypomeron flat, wide, narrower near anterior margin**.** *Scutellum:* shape variable, anterior margin arcuate.

Elytron without carinae; finely or coarsely punctate-striate, with nine rows of punctures; narrowly margined. Epipleuron sinuate, broad in basal 1/3, narrow in apical 2/3 with groove to receive lateral edge of abdominal ventrite 5. *Hind wing:* macropterous (in species examined).

Legs with major structures similarly proportioned; proleg shortest, metaleg longest. Procoxae oblong and flat, more widely separated than meso- and metacoxae; mesocoxae globular, separated by about one coxal width; metacoxae transverse, separated by about same distance as mesocoxae, excavate to receive femora; metatrochanters swollen; protibia weakly to strongly arcuate, sometimes deflexed (males); mesotibia weakly to moderately arcuate; metatibia straight; tarsomeres increasingly longer from base to apex, tarsomeres 1 and 2 very short, tarsomere 5 as long as previous 4 combined; claws simple.

Venter with short, fine, recumbent setae present on lateral surfaces including hypomera, pro-, meso- and metepisterna, mesepimera, epipleura; long, semi-recumbent setae present medially. Prosternum long; lateral surface angled at about 45° to central disc; prosternal process broad between procoxae, laterally margined, with a median, longitudinal carina terminating in a low protuberance. Mesoventrite very short, deeply excavate to receive prosternal spine. Metaventrite long, projecting anteriorly between mesocoxae, margined; lateral surface angled at about 45° to posterior disc; metathoracic discrimen distinct; posterior border bidentate between metacoxae; metanepisternum wider anteriorly than posteriorly. Abdomen convex, with 5 ventrites; punctures aligned with faint, transverse strigae; ventrite 1 with margined, triangular intercoxal process, posterior border straight; ventrites 2–4 transverse, subequal in length; ventrite 5 longer, with broadly rounded apex.

Genitalia. Male genitalia, trilobate type; female genitalia, common type (Kodada *et al.* 2016).

Original description. Erichson's 1847 descriptions of *Parygrus* and *Helichus* were presented in an annotated key. He cited the following characters for separating genera with "auriculate" antennae: Middle legs close to each other (*Parygrus* and *Parnus*); middle legs further apart (*Helichus* and *Dryops*). In addition, he stated that in *Parygrus* the elytra are clearly punctate-striate, and the antenna clearly "11-membered." Waterhouse (1876), in his paper describing the type species *P. erichsoni*, stated that Erichson had established the genus to include undescribed species from South America with narrow form and strongly striated elytra.

Sexual variation and dimorphism. Females are generally larger than males, and have a small, angular protuberance at the middle apex of abdominal ventrite 5 which is formed by a ventrally-directed fold. This feature is absent in males and therefore very useful in externally determining the sex of individuals. In the specimens we have examined, the protibiae of females were not deflexed and were usually less arcuate than those of conspecific males.

Reproductive period. Fifteen females were collected along with 11 males from Paraguay, Alto Paraguay, Puerto Esperanza, 2nd December 2006. Dissection found eggs in 13 of the 15 females. Thus the austral summer is the reproductive period. This is also true for *Pelonomus* spp. from Paraguay (W.D. Shepard, unpublished data).

Geographic distribution. *Parygrus* is recorded from Mexico, south through Central America and the South American countries of Venezuela, Colombia, Ecuador, Peru, Bolivia, Paraguay, Brazil, and Argentina (Figs 2, 3, 4**).**

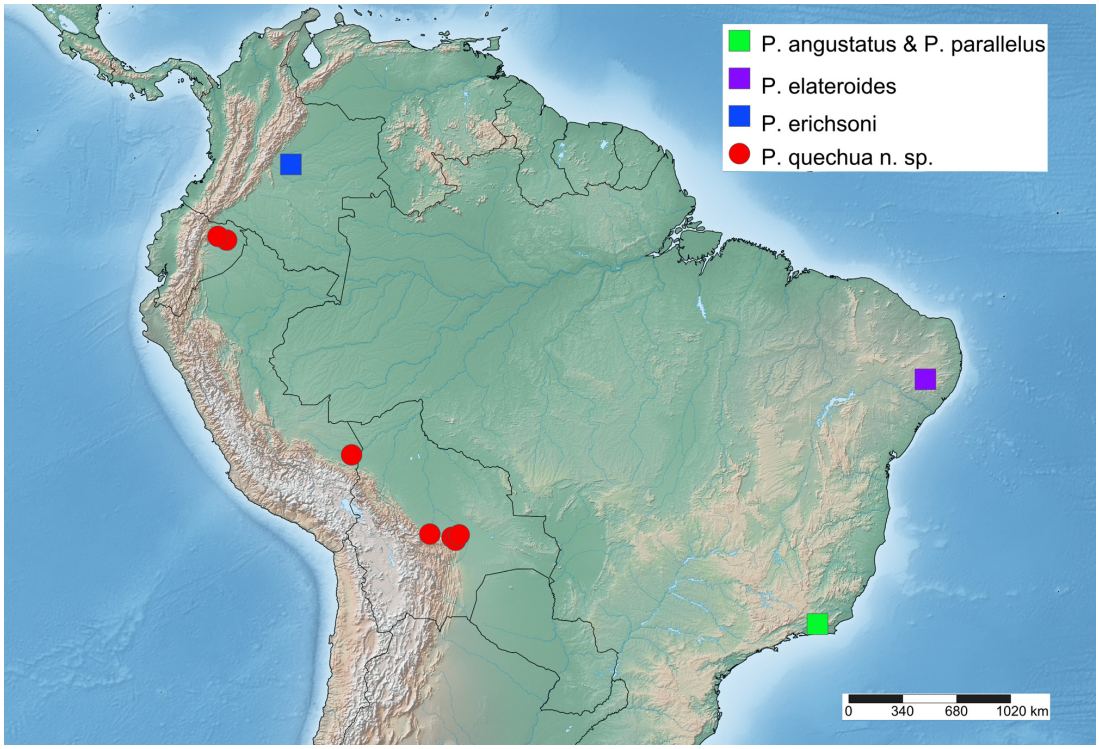


FIGURE 2. Map showing the type localities of original species *Parygrus angustatus*, *P. elateroides*, *P. erichsoni* and *P. parallelus*, and the geographical distribution of *P. quechua* **n. sp.**, in South America.

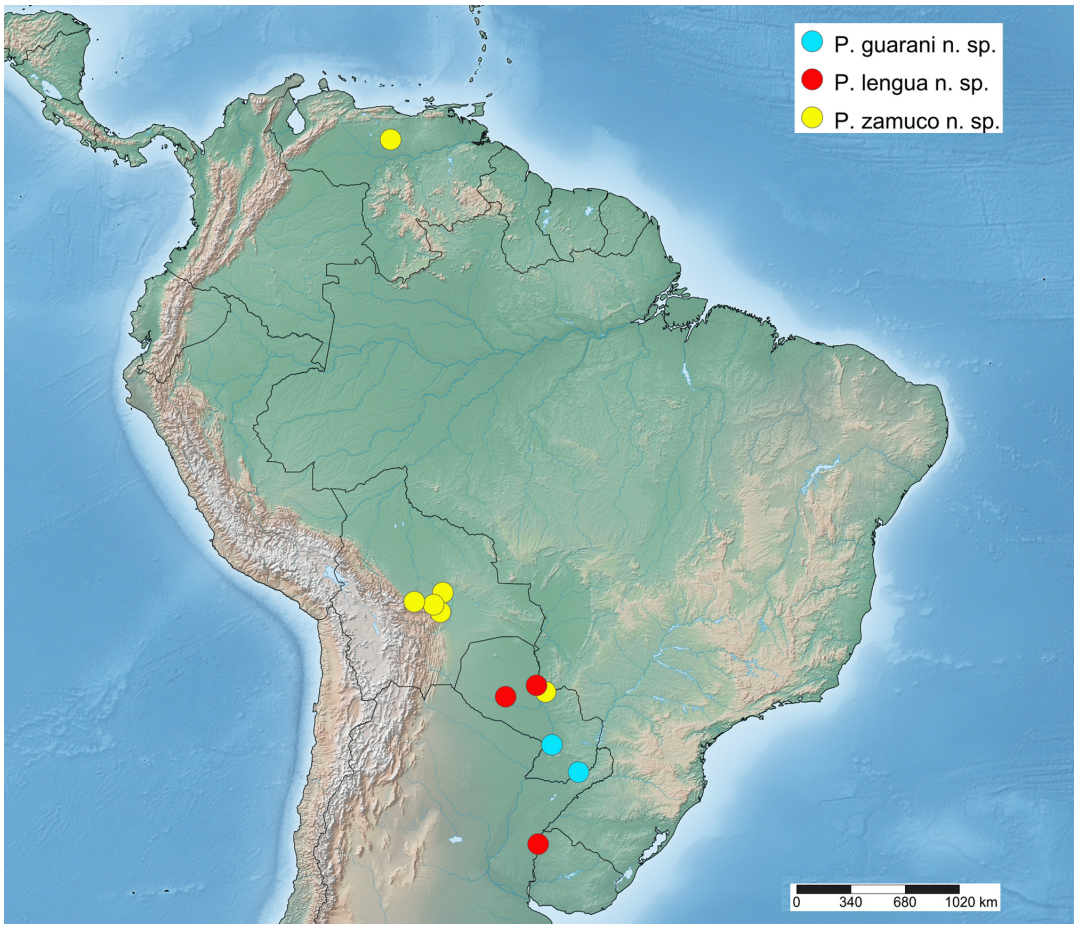


FIGURE 3. Geographical distribution map of *Parygrus guarani* **n. sp.**, *P. lengua* **n. sp.** and *P. zamuco* **n. sp.** in South America.

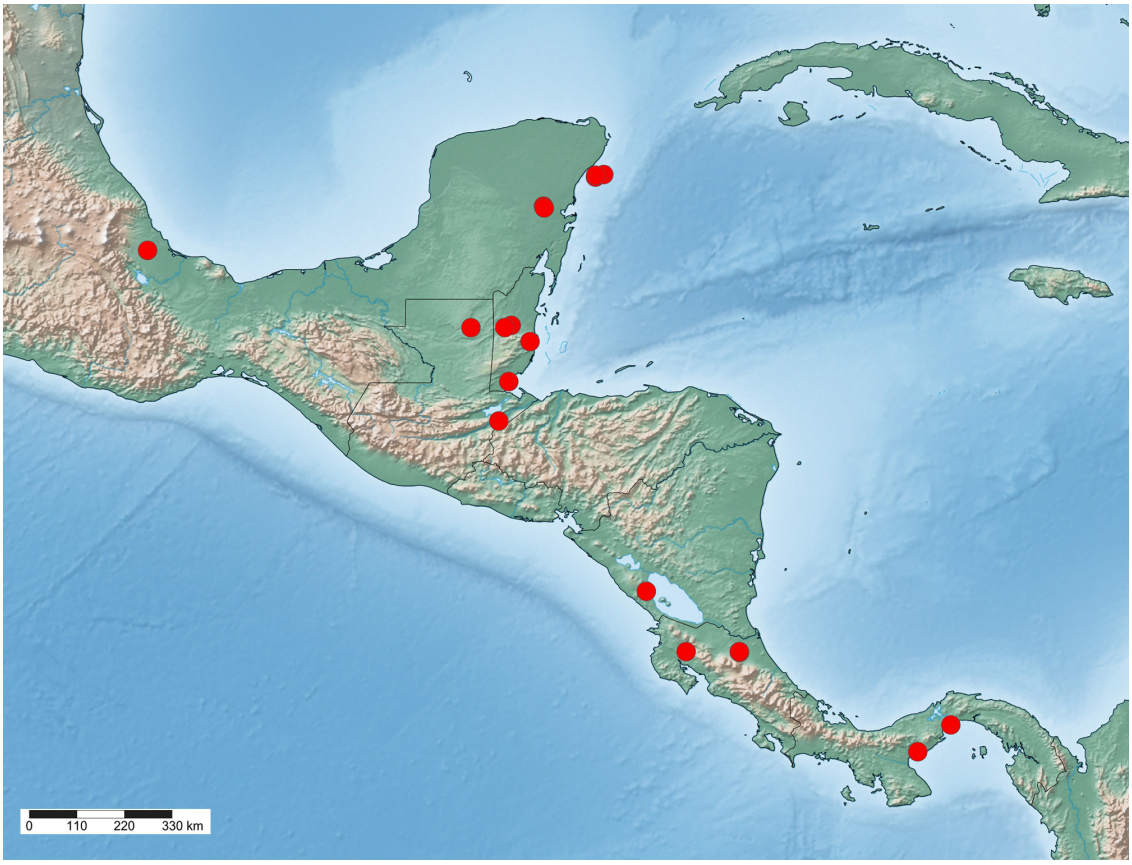


FIGURE 4. Geographical distribution map of *Parygrus maya* **n. sp.** in Mexico and Central America.

Key to the genera of Neotropical aquatic and semiaquatic Dryopidae

1	Body dorsally glabrous; lateral margin of each elytron interrupted near apex by a densely pubescent depression	*Elmoparnus* Sharp
–	Body dorsally pubescent or with plastron; lateral margin of each elytron without densely pubescent depression	2
2	Pronotum with complete sublateral carina/sulcus on each side.	*Dryops* Olivier
–	Pronotum without sublateral carinae/sulci or with only short carinae/sulci	3
3	Pronotum with sublateral carinae/sulci only in basal 1/4 to 1/3	8
–	Pronotum without sublateral carinae/sulci	4
4	Each antenna with 13 antennomeres	*Onopelmus* Spangler
–	Each antenna with 9 or 11 antennomeres	5
5	Each antenna with 9 antennomeres	*Guaranius* Spangler
–	Each antenna with 11 antennomeres	6
6	Antennomere 2 enlarged and covering rest of antennomeres	*Helichus* Erichson
–	Antennomere 2 may be enlarged but not covering rest of antennomeres	7
7	Antennomere 2 enlarged and at least covering antennomeres 3 and 4	*Parygrus* Erichson
–	Antennomere 2 not enlarged	*Pelonomus* Erichson
8	Length 6–10 mm; each antenna with 11 antennomeres; pro- and mesotarsus with tarsomere 2 wide and flattened in males	*Platyparnus* Shepard and Barr
–	Length 2–3 mm; each antenna with 10 antennomeres; no tarsomeres wide and flattened	*Microparnus* Shepard

Original species

Parygrus erichsoni Waterhouse, 1876

(Figs 2, 5, 6, 7)

Type material. Holotype female. "Type [circular off-white label with red border, printed] // Colum/bia [Colombia] 46 /20 [label reverse side] [circular off-white label, handwritten] / Parygrus / Erichsoni, / (Type.) C. Waterh.

[Waterhouse][off-white label, handwritten] // NHMUK 010580154 [white bar code label, printed]" (Fig. 5). Depository NHMUK. In his description, Waterhouse (1876:19**)** simply stated "Columbia. Brit. Mus."

Additional specimen examined. Male. COLOMBIA: "Columbia [Colombia] [circular off-white label, handwritten] // NHMUK 010580155 [white bar code label, printed]" (Fig. 6). Depository NHMUK.

Diagnosis. The male genitalia of *Parygrus erichsoni* (Fig. 7) are distinctive (among species for which the genitalia are known), although like *P. maya* **n. sp.** (Fig. 13) they bear a subapical tooth on the inner margins of each paramere. In the latter species, however, the penis does not closely approach the paramere teeth, while in *P. erichsoni* the penis nearly reaches the teeth. Also, the paramere tips of *P. erichsoni* are blunt in lateral view, whereas in *P. maya* **n. sp.** they are acute. Externally they are also dissimilar as follows: *Parygrus erichsoni* (Figs 5, 6) is covered with setae that are long, dark, coarse, and erect on the dorsum; and the pronotum is much wider at base than apex. *Parygrus maya* **n. sp.** (Fig. 12) has setae shorter, yellow, finer, and semi-erect; and the pronotum is usually almost as wide at apex as base. Note that this diagnosis of *P. erichsoni* is based on only two specimens.

Redescription. Holotype female. Cuticle dark brown, legs, antennae and mouthparts lighter; elongate, subcylindrical; length 5.75 mm (including head), 5.40 mm (excluding head, pronotum + elytra), 2.10 mm wide; body covered with long, erect, and short, fine, recumbent setae; pronotum slightly narrower than elytra (Fig. 5).

Head dark brown; punctation shallow, dense, punctures separated by about 1x puncture diameter; setae moderately long, erect; vertex depressed in middle; frons protruding forward between antennal bases, anterior margin arcuate, distance between antennal bases less than length of antennomere 1. Antenna with antennomeres 1 and 2 red-brown, setose, antennomeres 3–11 yellow-brown, densely setose; antennomere 1 shorter than antennomere 2; antennomere 2 covering antennomeres 3–5. Clypeus barely emarginate, setose, coarsely punctate. Maxillary palpus with terminal palpomere elongate, subcylindrical, weakly curved. Labrum emarginate, coarsely punctate, densely covered with long, erect setae. Labial palpus with terminal palpomere flattened, shorter than terminal maxillary palpomere.

Pronotum dark brown; convex, disc slightly flattened at center; length 1.25 mm, width 2.05 mm, widest at basal 1/4–1/3. Anterior border straight except at strongly acute, depressed, anterolateral angles; lateral margins narrowly margined, weakly arcuate, sinuate at moderately explanate, acute, posterolateral angles; posterior border trisinuate. Disc densely punctate, punctures separated by 1x puncture diameter; setae numerous, erect, moderately long. *Scutellum:* dark brown; subcordate, wider than long; anterior margin arcuate between two anterolateral notches, lateral borders nearly straight; disc flat, punctate.

Elytron dark brown; length 4.15 mm, width 1.05 mm; widest at posterior 1/3; depressed at base. Disc strongly striate and punctate, with deep, closely spaced, quadrate punctures separated by less than a puncture diameter, distinct to apex; intervals convex. Semi-erect setae moderately long, widely and evenly spaced; recumbent setae short, closely spaced. *Hind wing:* macropterous.

Legs. Profemur red-brown, covered with fine, evenly spaced punctures and long, recumbent golden setae; protibia weakly arcuate, red-brown, mostly bare and shiny, dorsal surface with sparse, very long setae, ventral surface with dense row of short setae at distal 1/2; protarsus yellow-brown, shiny, dorsal surface with sparse, very long setae, ventral surface with row of short, semi-erect setae, protarsomere 5 with two pairs of longer setae at apex. Mesofemur similar to profemur; mesotibia weakly arcuate, red-brown, ventral setae much longer than those of protibia and more numerous; left mesotarsus similar to protarsus except ventral setae much longer and more numerous [right mesotarsus missing]. Metafemur, metatibia and metatarsus all similar to those of mesoleg.

Venter dark red-brown; heavily setose, evenly punctate. Prostenum long; anterior border narrowly margined; prosternal process wide and slightly depressed between procoxae, parallel-sided with thick margins; process with low, median longitudinal carina terminating in a low, oval protuberance near apex. Mesoventrite very short. Metaventrite about as long as prosternum; intercoxal process margined and flat; posterior disc depressed at junction of sulcate metakatepisternal suture and metathoracic discrimen, discrimen angled posteriorly at junction. Abdomen with long setae more dense than on rest of body; ventrite 1 with triangular intercoxal process margined, slightly depressed between metacoxae; ventrites 2–4 of equal length, evenly punctate, punctures aligned with faint, transverse strigae; ventrite 5 longest, punctate, sparsely granulate laterally, disc centrally depressed, apex with small, angular ventrally directed protuberance, covered with long setae prominent at margins.

Male specimen. Length 5.25 mm (including head), 5.10 mm (excluding head, pronotum + elytra); 1.85 mm wide; somewhat smaller than the female holotype. The protibia of the male **(**Fig. 6) is weakly deflexed at the apical 1/2 and has a ventral, granulate carina, unlike that of the female (Fig. 5), but otherwise is morphologically similar to the female except for the sexual differences exhibited in abdominal ventrite 5.

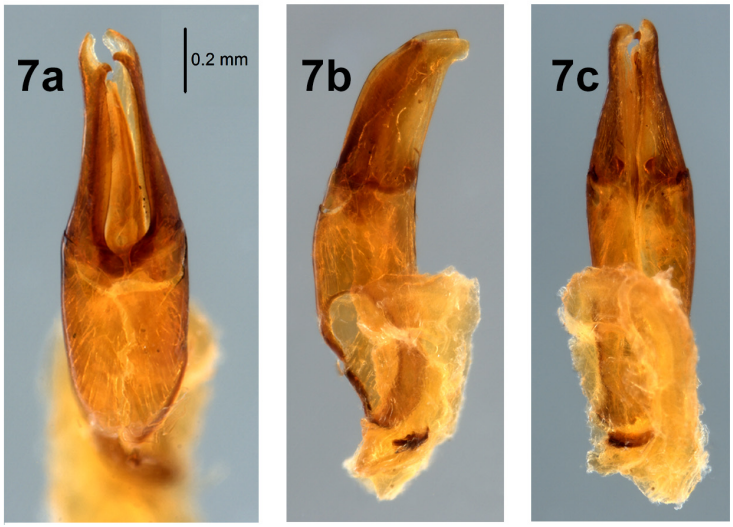


FIGURE 5. *Parygrus erichsoni,* holotype female: dorsal habitus; ventral habitus; lateral habitus; frontal view; specimen labels (specimen images provided by the NHMUK).

FIGURE 6. *Parygrus erichsoni,* non-type associated male: dorsal habitus; ventral habitus; lateral habitus; frontal view; specimen labels (specimen images provided by the NHMUK).

FIGURE 7. *Parygrus erichsoni,* male genitalia: a) dorsal view; b) lateral view; c) ventral view.

Genitalia. Aedeagus stout (Fig. 7). Phallobase about 1.5x longer and a little wider than paramere bases together. Parameres each blade-like, inner surface concave, in dorsal view each with an inward-facing tooth just before apex; teeth overlapping, apices capable of contacting each other; in lateral view each paramere wide, ventral surface nearly straight, dorsal surface broadly arcuate, paramere tip blunt. Penis 3/4 or more length of paramere, terminating just before paramere teeth; in dorsal view wider than paramere at midlength; evenly tapered to a slightly produced, blunt apex; dorsum longitudinally carinate. Note: The specimen no longer appears as in Fig. 6. In order to dissect the genitalia, the specimen was removed from the original pin and later remounted on a pinned card point along with abdominal ventrites 3–5; the aedeagus is stored in glycerine in a genitalia vial pinned beneath the specimen.

Geographic distribution. Known only from Colombia. Because the specific type locality is unknown, the star on the distribution map is positioned mid-country (Fig. 2).

Etymology. Waterhouse did not cite an etymology, but the specific epithet undoubtedly honored Dr. W. F. Erichson, the author of the genus and a noted, early German entomologist who specialized in Coleoptera.

Comments. Waterhouse (1876) wrote his description of *P. erichsoni* in Latin followed by an English comparison with the species *Parnus prolifericornis* Fabricius, 1792 (synonym of *Dryops auriculatus* (Geoffroy, 1785)). At the end of the Latin description is the line "Long. 2 ¾ lin.; lat. 1 lin." This is likely the length vs. width body proportions. Waterhouse made no mention of the number of specimens before him. However, the type female and associated male have nearly identical locality labels with the same handwriting and were mounted similarly. *Parygrus erichsoni* is the type species of the genus.

Parygrus angustatus Grouvelle, 1896

(Figs 2, 8, 9)

Holotype specimen. BRAZIL: "Bresil / R. de Jan [blue-green, handwritten] // Museum Paris / 1917 / Coll. Grouvelle [white, printed] // TYPE [red, printed] // Dryops /angustatus / ty. Grouv [off-white, handwritten]". In his description, Grouvelle stated "Rio de Janeiro. Collection Grouvelle" (Grouvelle 1896a, p. 215). Depository, MNHN. The type specimen itself was not examined, only the photographic image and label data from the photo.

Additional specimens, photographic images (2). BRAZIL: "Bresil / Theresop [handwritten] // MUSEUM PARIS [light blue, printed] / Coll. A. Grouvelle 1915 // Parygrus / angustatus / gr. [handwritten]"; "Neu-Freiburg, / Süd-Brasilien. / F. Wiengreen leg. / ded. 9.11. 1897. // Parygrus angustatus / Grouv.". Depository, MNHN. Only photographic images and label data from the photos were examined.

Additional specimens examined (7). BRAZIL: "Type [circular label with red border, printed] // 20295 [handwritten] // Fry / Rio Jan°. [handwritten] // Fry Coll. / 1905-100." [printed] // "Parygrus angustatus / ty. Grouv [handwritten]" (1; head missing); "Fry / Rio Jan°. [handwritten] // Fry Coll. / 1905-100. [printed]" (2); "Fry / Rio Jan°. [handwritten] // Fry Coll. / 1905-100. [printed] // Parygrus / angustatus [handwritten]" (1; right elytron missing); "9354 // Fry / Rio Jan°. [handwritten] // Fry Coll. / 1905-100. [printed] // Parygrus / angustatus / var. [?-illegible word] Grouv [handwritten]" (1); "Rio [pink oval label, handwritten] // Pascoe / Coll. / 93–60." [printed] (1). **ARGENTINA:** "Argentine Republic: / Villa Ana, F. C. S. Fe. / December 1924. / K. J. Hayward. // Brit. Mus. / 1925-217" [printed] (1). Depository, NHMUK. These specimens may not be conspecific with the type nor with each other; see Discussion below.

Provisional diagnosis. The type specimen of *P. angustatus* (Fig. 8) is much longer (7–8 mm) than specimens of any of the other species except for *P. parallelus* (Fig. 11). Keeping in mind that the images of *P. parallelus* are not of the type, *P. angustatus* appears to differ from that species by the following: elytra parallel-sided (vs. sinuate laterally, not parallel-sided); pronotum widest in about a third of the distance from the base (vs. widest at base), lateral margins not raised nor widely explanate (vs. raised, widely explanate), with a weak longitudinal carina (not visible in Fig. 8) (vs. without a carina); elytral striae not distinct, punctures small (vs. striae distinct, punctures larger), effaced at posterior third (vs. not effaced).

General description. Since we were unable to examine the holotype, only a limited description is possible based on the original descriptions (Grouvelle 1896a) and images of the type (Fig. 8). From a translation of the original Latin and French descriptions: 7–8 mm long, elongate-oval; convex; pronotum widest at basal third, with a weak longitudinal carina (subcarinate), anterior margin not rimmed in the middle, lateral borders arcuate; scutellum curvilinear triangular; elytra a little wider than pronotum at base, punctate-striate, striae effaced at posterior third.

Additional observations from the image of the type: body is parallel-sided and tapered posteriorly; pronotal posterolateral angles are depressed, if not explanate; median longitudinal pronotal carina is not discernable in the Fig. 8; elytra punctate but not obviously striate, punctures small and shallow; protibiae deflexed and enlarged at apical third, indicating that the type is likely a male.

Distribution. Brazil (described from Rio de Janeiro), and possibly Argentina (Fig. 2).

Etymology. Grouvelle did not cite an etymology. However, the specific epithet *angustatus* is composed of *angustus* (L.), meaning "narrow," and *–atus* (L.), meaning "having the nature of."

Comments. *Parygrus angustatus* was described by Grouvelle (1896a) in both Latin and French, the French description being the more detailed. There are two specimens labeled as the type of *P. angustatus*, one in the MNHN (Fig. 8) and the other in the NHMUK (Fig. 9). The true type, with data closest in agreement with that in Grouvelle's description, is the MNHN specimen. Nonetheless, it is puzzling that it bears the determination label "Dryops angustatus" (Fig. 8) because Grouvelle described the species in *Parygrus*.

It is interesting that the determination label of the NHMUK specimen (Fig. 9), also from Rio de Janeiero, Brazil and labeled as the type of *P. angustatus*, is written in the same hand as the determination label of Grouvelle's *P. elateroides* holotype (Fig. 10). Yet the circular format of the type label of the NHMUK specimen, from the Fry Collection, is identical to the type label of *P. erichsoni* described by Waterhouse 20 years earlier. These are of a different format than the type labels from the MNHN Grouvelle collection, which are rectangular.

The determination labels on two other images sent from the MNHN (Additional specimens, photographic images) do not match the handwriting of the label on the type, but one of them bears a Grouvelle Collection label. We suspect that they may not be *P. angustatus* for the following reasons: In comparison with the image of the type, they both have pronota with widely explanate lateral margins that are widest near the base. The image of the type does not appear to have these pronotal characters, but the angle at which it was taken may have influenced this. Nonetheless, explanate pronotal margins are not mentioned in the description, and the pronotum was stated to be widest at the first third from the base. In addition, the type has the elytra parallel-sided, whereas the others are sinuate with the margin explanate at the basal third. They more closely resemble the non-type images of *P. parallelus* than that of the type of *P. angustatus*.

Among the seven specimens examined from the NHMUK (Additional specimens examined), five were labeled as being from the Fry Collection, including the erroneously-labeled "type." The "type" and another of these specimens have similarly handwritten determination labels, which are not in the same hand as the actual type. There is a good deal of morphological variation among the additional specimens (i.e., pronota with or without a longitudinal carina and/or explanate lateral margins) so they are likely not all *P. angustatus* or all conspecific. However, the false type, a female (Fig. 9), does resemble the image of the holotype, likely a male (Fig. 8).

Parygrus elateroides Grouvelle, 1896

(Figs 2, 10)

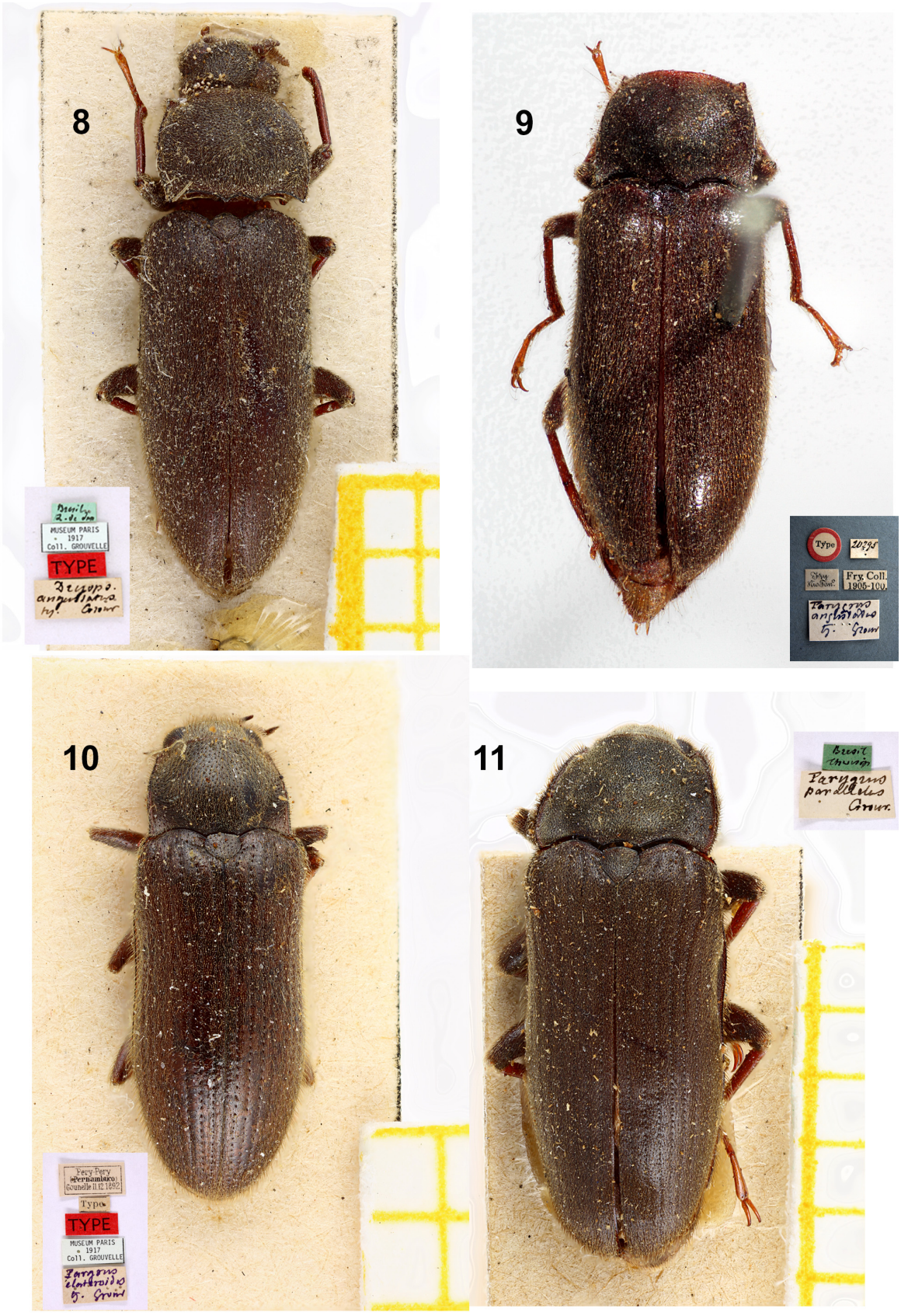
Holotype specimen. BRAZIL: "Pery-Pery / (Pernambuco) / Gounelle 11.12.1892 [off-white label with black border, printed] // Type [off-white label, printed] // TYPE [red label, printed] // MUSEUM PARIS / 1917 / Coll. Grouvelle [light blue label, printed] // Pargrus [sic] elateroides / ty. Grouv [off-white label, handwritten]". Depository, MNHN. The type specimen itself was not examined, only the photographic image and label data from the photo.

Additional specimens examined (2). BRAZIL: "80.43 // Parnus / elateroides [illegible letters] / Braz. [handwritten] // [red label with no writing]" (abdomen missing); "Brazil. / Castlenau [Castelnau?][on mounting card] // Sharp Coll. / 1905-313 [printed] // Pelonomus / elateroides [illegible letters] / Bras." [blue label, handwritten]". Depository NHMUK. These may not be conspecific with the type or with each other; see Discussion below.

Provisional diagnosis. The explanate lateral margins of the pronotum and small size (about 5 mm long), serve to separate *P. elateroides* (Fig. 10) from the other species of *Parygrus*. The only other species with an explanate pronotum is *P. parallelus* (Fig. 11), which is 7–8 mm long.

General description. Since we were unable to examine the holotype, only a limited description is possible based on the original descriptions (Grouvelle 1896b) and images of the type (Fig. 10). From a translation of the original Latin and French descriptions: 5 mm long; convex; pronotal lateral border raised in a thin rim; scutellum oval, acuminate apically; elytra wider than pronotum, fairly strongly punctate-striate. To this we add that the prono-

tum is quite convex and deeply punctate, widest at the base, lateral margins are arcuate and moderately explanate, and posterolateral angles broadly explanate.



FIGURES 8–11. *Parygrus* species: 8) *Parygrus angustatus*, holotype: dorsal habitus; specimen labels; 9) *Parygrus angustatus*, false holotype: dorsal habitus; specimen labels; 10) *Parygrus elateroides*, holotype: dorsal habitus; specimen labels; 11) *Parygrus parallelus*, non-type: dorsal habitus; specimen labels (images 8, 10, 11 provided by the MNHN collection-Paris).

Distribution. Brazil, described from the Province de Pernambuco (Fig. 2).

Etymology. Grouvelle did not cite an etymology, but the name probably refers to the resemblance of the species to an elaterid or click beetle. The ending *–oides*, from the Greek *–eides* and *-eidos,* means "like, resembling, having the form of."

Comments. Grouvelle (1896b) described the species in both Latin and French, the French description being the more detailed. The specimen was noted as being 5 mm long, however, measurement of the type image using the included scale indicates it is closer to 5.5 mm long. On the determination label of the holotype the genus is misspelled as "Pargrus" (Fig. 10).

In his description of *Parygrus elateroides*, Grouvelle (1896b, p. 34) stated the type locality as "Brésil: Province de Pernambuco (Pery-Pery). – Collection Gounelle." He reported that he had seen specimens of *P. elateroides* from S. Paul (Brésil) belonging to the Fry Collection, that were larger and more stocky. We examined two specimens labeled as *P. elateroides* from the NHMUK, cited above in Additional specimens examined, however, neither of these has Fry Collection labels. Without actually examining the type specimen we are unable to confirm these determinations and, in fact, suspect they are incorrect. At 7.5 and 8.5 mm long the specimens are at least 2.0–3.0 mm longer than the type, and one of them does not resemble the type image. In addition, they are likely not conspecific due to morphological dissimilarities (i.e., puncto-striation, setation, scutellar shape).

Parygrus parallelus (Grouvelle, 1890)

(Figs 2, 11)

Holotype specimen. BRAZIL: "Theresopolis (Brésil)" (Grouvelle 1890, p. 146); "Theresopolis (Rio de Janeiro). Collection Grouvelle." (Grouvelle 1896a, p. 216). Depository, MNHN. The type was not examined; locality data is from the original and subsequent descriptions. The type could not be located at the MNHN and its current whereabouts is unknown.

Additional specimens, photographic images (2). BRAZIL: "Bresil / Theresop[olis] // Parygrus / parallelus / Grouv. [handwritten]". Depository, MNHN. Only photographic images and label data from the photos were examined.

Additional specimens examined (8). BRAZIL: "Brasil / Theres[opolis] // Parygrus / parallelus / Grouv. [handwritten]// Coll. Van de Poll / 1937-744. // H.E. Hinton / collection. / B.M. 1977-566. [printed]" (1 specimen; head, pronotum and abdomen missing); "Fry / Rio Jan°. [handwritten] // G. Lewis Coll. / 1915-38. [printed]" (1 specimen); "Beske // Fry / Rio Jan°. [handwritten] // Fry Coll. / 1905-100. [printed]" (1 specimen); "5797 // Beske // Fry / Rio Jan°. [handwritten] // Fry Coll. / 1905-100. [printed] // Parygrus / parallelus / Grouv. [handwritten]" (1 specimen; abdomen missing); "Weir // San / Paulo [handwritten] // Fry Coll. / 1905-100. [printed]" (1 specimen); "27079 // Weir // San / Paulo [handwritten] // Fry Coll. / 1905-100. [printed] // Parygrus / parallelus / [illegible word] Grouv [handwritten]" (1 specimen; head and pronotum missing); "San / Paulo [handwritten] // G. Lewis Coll. / 1915-38 [printed]" (2 specimens; 1 abdomen missing). Depository, NHMUK.

Provisional diagnosis. The type specimen of *P. parallelus* is much longer (7–8 mm) than the length of the other species except for that of *P. angustatus*. Considering that an image of the type *P. parallelus* was not available for examination, the following was observed from images of two non-types (Additional specimens, photographic images) (Fig. 11) in comparison with the type image of *P. angustatus* (Fig. 8): elytra sinuate laterally, margin explanate at basal third (vs. parallel-sided, not explanate); pronotum widest at base, lateral margins raised and widely explanate (vs. not raised nor explanate), without a median longitudinal carina (vs. with a carina); elytral striae and punctures distinct (vs. striae not distinct, effaced at posterior third, punctures small).

General description. Since we were unable to examine or view an image of the holotype, only a limited description is possible based on the original descriptions (Grouvelle 1890) and images of other specimens of *P. parallelus* from the Grouvelle Collection that we assume are correctly identified. From a translation of the original Latin and French descriptions: 7–8 mm long; elongate parallel; weakly convex; transverse carina between antennal insertions; scutellum pentagonal; pronotal anterior margin emarginate, lateral margins widely explanate and raised, fringed with long hairs; elytra not wider than pronotum, punctate-striate. To this we add that the elytral lateral margin is explanate at the basal third, that contrary to the description the elytra appear a little wider than the pronotum, and that it is not possible to see the transverse carina between the antennal insertions (Fig. 11). The latter character is perhaps generic because the frons and clypeus are set at different angles forming a rounded ridge between.

Distribution. Brazil, described from Rio de Janeiro (Fig. 2).

Etymology. Grouvelle did not cite an etymology, but the specific epithet probably refers to the parallel-sided body.

Comments. Grouvelle (1890) originally described *P. parallelus* in *Parnus* and subsequently moved it to *Parygrus* (Grouvelle 1896a). The original description in Latin is brief and was presented at a meeting of the Entomological Society of France. The later description includes the verbatim original in Latin, as well as a more detailed one in French.

The holotype could not be located in the MNHN. We were sent images of two specimens of *P. parallelus* **(**Additional specimens, photographic images), one of which is included here (Fig. 11), and one image of a series of specimens in a museum unit tray. Several of the specimens in the image bear locality label data which match that of the type locality. At least two pins (one pin bears multiple specimens) have determination labels with the same handwriting as the holotype of *P. angustatus* and possibly *P. elateroides*, but the labels do not bear the notation "ty." in the lower left corner. If the type remains missing, a lectotype should be designated.

We were loaned a series of specimens from the NHMUK (Additional specimens examined), four of which were from the Fry Collection. Three of these bear determination labels with the same handwriting as the specimens labeled as *P. parallelus* from the Grouvelle collection. Unfortunately, two of them are missing the pronotum (and head), where important diagnostic characters are located. The remaining determined specimen and another Fry specimen, both from Rio de Janeiro, closely resemble those in the MNHN images, as do two other specimens from Sao Paulo collected by Lewis.

New species

Parygrus maya Barr and Shepard, new species

(Figs 1, 4, 12, 13)

http://zoobank.org/DCFAFCB8-D6F7-4454-95DA-54A02957EF03

Type material. Holotype male. MEXICO. "MEXICO: Quintana Roo / Isla de Cozumel, W side / 4.5km S Chankanaab NP / 12-X-1997 coll. C.B. Barr // shallow roadside / ditch/wet grassy area // HOLOTYPE / Parygrus maya / Barr & Shepard" [red label, handwritten] (UNAM). **Paratypes (78; 43 M, 35 F). BELIZE** (17 M, 13 F)**.** BELIZE: Cayo / Dist., Mile 66 / Western Hwy., W.D. Hasse / VII-5-1969 [?] // Property of Florida / State Collection of / Arthropods (1 F, FSCA); BELIZE: Cayo Dist / Belmopan airport / 8.VIII.1993 / at blacklights // William D. / Shepard, leg. (1 M, EMEC); BELIZE: Cayo Dist. / Las Cuevas Field / Station, Millionario / Camp, Tapir Pond / 30-VI-2019, D.L.Post // 16.75275, -89.00840 / elevation 605 m (1 M, 2 F, EMEC); BELIZE: Stann Cr. Dist. / Bocawina – Pond / near Silk Grass Creek / 07-VIII-2017, D. L. Post (10 M, 7 F, EMEC; 1 M, 1 F, FSCA; 1 M, 1 F, NHMUK; 1 M, 1 F, USNM); BELIZE: Toledo District: Hickatee / Cottages, 2.6 km W of Punta Gorda / on Ex-Serviceman Rd. 15-21.vi.2008 / 16°05′40″N 88°49′57.9″W 10m, ex: / mercury vapor lamp, F.G. Andrews (2 M, CSCA). **COSTA RICA** (2 M, 7 F)**.** La Pacifica, 4 Km / N.W. Canas, Costa / Rica, Guanacaste / Prov., VIII-26-71 / P.A.Opler, collr. // U. V. light trap (1 F, EMEC); COSTA RICA: Guanacaste / 8 km NW Filadelfia / 16 VI 2003 280′ / Roadside pool // William D. / Shepard, leg. (1F, EMEC); C.R., Heredia, La / Selva Biol.Sta.2Km. / S.Pt.Viejo:VI-3-5-84 / Riley, Rider & LeDoux (1 M, LSAM); C.R., Heredia / 1 Km S. Pt. Viejo / VI-4-5-84: E.Riley / D.Rider & D.LeDoux (3 F, LSAM); COSTA RICA: Heredia / Pr: La Selva Biol.Sta. / 3 km S Pto. Viejo / 10°2′6N 84°01′W // 20. v. 1990 / H.A. Hespenheide (1 F, EMEC); COSTA RICA: Heredia / Est. Biol. La Selva / 03 July 2001 / CL & SL Staines / Taken / at light (1 M, EMEC); COSTA RICA: Heredia / La Selva Biol. St. / 14-15-I-2005 / HG-vapor lights / A.E.Z.Short, leg. (1F, EMEC). **GUATEMALA** (2 M, 1 F)**.** GUATEMALA: Dept. Iza- / bal, Quirigua Ruins, / near Los Amates, 61m / 4-IX-1976 / Edward S. Ross / Cal. Acad. Sci. Coll. (1M, CASC); GUATAMALA [GUATEMALA]: Izabel [Izabal] / Ruinas Quirigua / VII-5-1977 / E.M.Fisher coll. (1M, CSCA); GUATEMALA: Peten: / Ruinas Tikal / 245m. 7/10July77 / E.M. & J.L.Fisher (1 F, CASC). **MEXICO** (15 M, 14 F)**.** MEXICO: Quintana Roo / 17km NW Felipe / Carrillo Puerto / 17-VI-1990 / coll. M.C. Thomas (1 M, FSCA); MEX: Quintana Roo / 20 Km.N.Felipe Car- / rillo Puerto: VI- / 12-14-83:E.Riley (1 M, 1 F, LSAM); MEXICO: Quintana Roo / Isla de Cozumel, SW side / 2 mi.W Cedral, 6-X-1993 / C.B.Barr & W.D.Shepard // shallow roadside / ditch/wet grassy area (2 M, 2 F, EMEC); MEXICO: Quintana Roo / Isla de Cozumel, SW side / 2 mi.W Cedral, 8-X-1993 / C.B.Barr & W.D.Shepard // shallow

roadside / ditch/wet grassy area (1 M, 1 F, EMEC); MEXICO: Quintana Roo / Isla de Cozumel, E end / Cross Island Rd., 7-X-1993 / C.B.Barr & W.D.Shepard // shallow / roadside pond (1 F, EMEC); MEXICO: Quintana Roo / Isla de Cozumel, W side / 4.5km S Chankanaab NP / 11-X-1997 coll. C.B. Barr // shallow roadside / ditch/wet grassy area (2 F, EMEC); MEXICO: Quintana Roo / Isla de Cozumel, W side / 4.5km S Chankanaab NP / 12-X-1997 coll. C.B. Barr // shallow roadside / ditch/wet grassy area (3 M, 2 F, EMEC; 1 M, 1 F, UNAM); MEXICO: Quintana Roo / Isla de Cozumel, W side / 4.4km S Chankanaab NP / 13-X-1997 coll. C.B. Barr // shallow roadside / ditch/wet grassy area (4 M, 2 F, EMEC; 3 M, 1 F, UNAM); MEXICO: Veracruz / Experiment Sta. / Cotaxtla / 24.VI.1958 / In light trap (1 F, CASC). **NICARAGUA** (1 M)**.** NICARAGUA: Granada Prov., Domitila Reserva / Silvestre Privada ESE / Nandaime, elev. 400' / 11°42.5′N, 85°57.2′W // 9-VI-2005, C.B. Barr / C.S. Chaboo & W.D. / Shepard, collected at / blacklight near river (1 M, EMEC). **PANAMA** (6 M)**.** PANAMA: Canal Zone / Fort Kobbe: 9 June 1976 / coll: E. G. Riley / black light trap (2 M, UMC); PANAMA: Prov. Coclé / 5 rd. km S of Anton / nr. Los Pantones, BL/MV / 29-VIII-2006, C.B.Barr // 08°21.342′ N / 80°16.515′ W / elevation 59 ft. (1M, EMEC); PANAMA: Coclé / 5 km S Anton / 29 VIII 06 59′ / Black & MV lights // Doug / Post, leg. (3 M, EMEC; 1M, STRI). All paratypes also have the following final label: PARATYPE / *Parygrus maya* / Barr & Shepard [yellow label, printed].

Diagnosis. The male genitalia of *Parygrus maya* **n. sp.** (Fig. 13) are distinctive (among species for which the genitalia are known), although they are somewhat similar to those of *P. erichsoni* (Fig. 7) in that they bear a subapical tooth on each paramere. In the latter species, however, the penis is longer, nearly reaches the paramere teeth, while in *P. maya* **n. sp.** the penis does not closely approach the teeth. Externally they are also dissimilar as follows: *Parygrus maya* **n. sp.** is covered in setae that are moderately long, fine, yellow, and semi-erect on the dorsum; and the pronotum is usually almost as wide at apex as base. *Parygrus erichsoni* has setae that are longer, coarse, dark, and erect on the dorsum; and the pronotum is wider at base than apex.

Description. Holotype male. Cuticle dark brown, legs, antennae and mouthparts lighter; elongate, subcylindrical; length 4.35 mm (pronotum + elytra), width 1.60 mm; body covered with erect and semi-erect, long, golden setae and much shorter, recumbent setae (Fig. 12).

Head dark brown; punctuation fine, dense, punctures separated by about 1x puncture diameter; setae moderately long; vertex with shallow median depression; frons raised and protruding forward between antennal bases, anterior margin arcuate, distance between antennal bases less than length of antennomere 1. Antenna with antennomeres 1 and 2 light brown, setose, antennomeres 3–11 yellow, densely setose; antennomere 1 nearly as long as antennomere 2; antennomere 2 covering antennomeres 3–5. Clypeus densely setose, coarsely punctate, barely emarginate. Maxillary palpus with terminal palpomere elongate, subcylindrical, weakly curved. Labrum emarginate, densely setose, border fringed with long setae. Labial palpus with terminal palpomere subrectangular, slightly flattened; length about 2/3 that of terminal maxillary palpomere.

Pronotum dark brown; weakly convex, disc slightly flattened at center; length 1.00 mm, width 1.25 mm, widest at middle. Anterior margin straight except at strongly acute, depressed, anterolateral angles; lateral margins nearly parallel, weakly sinuate at lateral angles, narrowly margined, fringed with erect setae; posterolateral angles acute, explanate; posterior border trisinuate. Disc punctuation fine, slightly coarser than on head, punctures separated by slightly less than 1x puncture diameter; setae moderately long. *Scutellum:* dark brown; subcircular; anterior margin weakly arcuate between two anterolateral notches; disc weakly convex; punctation very fine.

Elytron dark brown, length 3.40 mm, width 0.80 mm, convex, narrowest at basal 1/3, widest at apical 1/3. Humeral angle rounded; lateral margin widened and shallowly sulcate at basal 1/3, entire length narrowly margined; apex acute. Disc strongly punctate and striate with deep, closely spaced punctures distinct from near base to apex, intervals weakly convex; setae shorter than on pronotum, semi-erect and recumbent, uniformly distributed. *Hind wing:* macropterous.

Legs. Profemur red-brown, covered with fine, evenly spaced punctures and long, recumbent golden setae; protibia red-brown, mostly bare and shiny, dorsal surface with sparse, very long setae, ventral surface with dense row of short, stiff setae, deflexed and slightly swollen at apical 1/2, ventral apex with ventral granulate carina and narrow spines; protarsus yellow-brown, shiny, dorsal surface with sparse, very long setae, ventral surface with row of short, erect setae, protarsomeres 4 and 5 each with a few much-longer dorsal setae. Mesofemur similar to profemur; mesotibia red-brown, ventral setae much longer than those of protibia; mesotarsus similar to protarsus except ventral setae much longer, weakly arcuate at apical 1/2 with spinose ventral apex. Metafemur, and metatarsus similar to those of mesoleg, metatibia straight with spines at ventral apex.

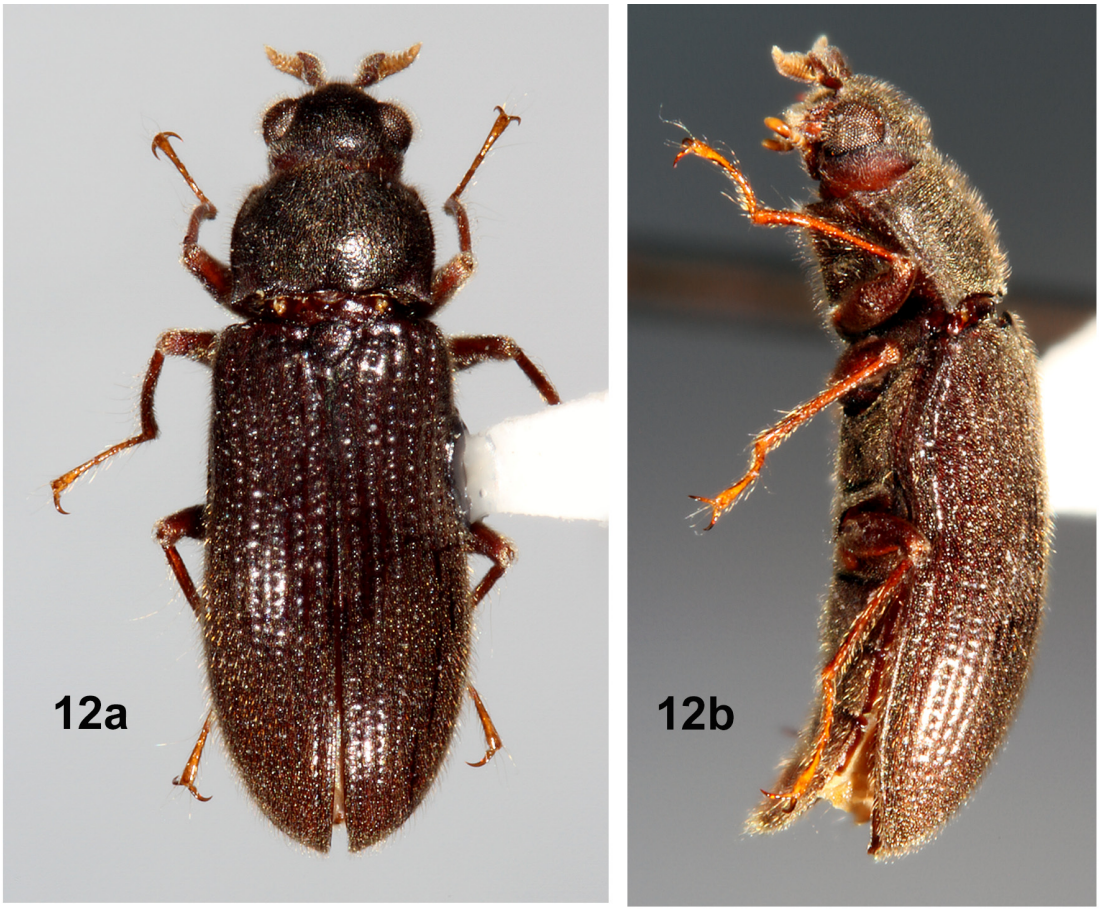


FIGURE 12. *Parygrus maya* **n. sp.**, male; 4.60 mm long, 1.70 mm wide: a) dorsal habitus; b) lateral habitus.
FIGURE 13. *Parygrus maya* ***n. sp.***, male genitalia: a) dorsal view; b) lateral view; c) ventral view.

Venter red-brown; heavily setose; finely to coarsely punctate. Prosternum with anterior border narrowly margined; prosternal process wide between procoxae, parallel-sided with thick margins; process with median longitudinal carina, bordered laterally by shallow sulci, terminating in an elongate protuberance near apex. Metaventrite with intercoxal process margined and depressed; posterior disc weakly depressed at junction of sulcate metakatepisternal suture and metathoracic discrimen. Abdomen with some setae longer than on rest of body except legs; ventrite 1 with triangular intercoxal process weakly depressed between metacoxae, thickly margined laterally; ventrites 2–4 of equal length, finely and evenly punctate at center of disc, coarser laterally, aligned with faint, transverse strigae; ventrite 5 longest, disc coarsely punctate, covered with long setae prominent at margins.

Genitalia. Aedeagus stout (Fig. 13). Phallobase about 1.5x longer than parameres and a little wider than paramere bases together. Parameres each blade-like, inner surface concave; in dorsal view each with an inward-facing tooth just before apex; teeth overlap with apices not contacting, producing an apical notch; in lateral view each paramere wide, curved ventrally, ventral surface broadly arcuate, dorsal surface sinuate, paramere tip acute. Penis about 2/3 length of parameres, in dorsal view wider at midlength than paramere at midlength; elongate-oval, dorsum strongly longitudinally carinate, apex pointed.

Intraspecific variation. Other than size and sexually dimorphic characters, there is very little discernable difference among individuals. There is about 1 mm variation in length among specimens of the same sex, and females are slightly larger than males: males 4.10–4.95 mm long (n=22); females 4.30–5.45 mm long (n=16). Males have deflexed protibiae, each with a granulate carina on the ventral apex; females have protibiae arcuate and lack carinae. In both males and females there is slight variation between individuals in respect to the shape of the pronotal lateral margins, the scutellar shape, and the degree of prosternal process sculpturing. Some specimens are much paler in color and are likely teneral.

Geographic distribution. Southern Mexico through Central America (Belize, Guatemala, Nicaragua, Costa Rica, Panama) (Fig. 4).

Etymology. This new species is named in honor of the *Maya*, the indigenous people of northwestern Mesoamerica who inhabit part of the area where this species occurs.

Habitat and behavior. At the type locality and two other collection sites on the Isla de Cozumel, Mexico, *P. maya* **n. sp.** was found in shallow water in roadside ditches and small ponds with a primary substrate of limestone bedrock. The most productive collecting site was mostly shaded, with cool water and abundant emergent vegetation (Fig. 1). The beetles occurred together with *Pelonomus* on the submerged stems of emergent plants and could be seen beneath the water surface encased in silvery bubbles of air. One of the beetles captured in a net was released to observe its behavior: It initially floated atop the water for a few seconds, then struggled to break through the surface film in order to submerge itself. After doing so, it crawled upside-down beneath the film until it encountered and grasped the submerged portion of a grass stem. In Panama we collected *P. maya* **n. sp.** at black and mercury vapor lights adjacent to a drainage ditch and rice fields.

All but one of our collections of *P. maya* **n. sp.** have been in conjunction with collections of *Pelonomus*. Both genera are semiaquatic and appear to share the same types of lentic habitats.

Parygrus guarani Barr and Shepard, new species

(Figs 3, 14, 15)

http://zoobank.org/ADB49206-58A4-48C0-8578-8BC67B175FDB

Type material. Holotype male. PARAGUAY. " PARAGUAY: ITAPUA / 17 km N Hohenau / Feb. 2-4, 1983 / Coll. E.G.Riley // HOLOTYPE / Parygrus guarani / Barr & Shepard [red label, handwritten] // EMEC49556" (EMEC). **Paratypes (1 M).** [as above] // PARATYPE / *Parygrus guarani* / Barr & Shepard [yellow label, printed] (1 M, EMEC).

Additional material examined (2 F). [as above] (1 F, LSAM); PARAGUAY: Cordillera Dept. / Caacupé, Campamento Jack / Morment; UV light trap / S25°22.116′, W057°07.917′/ 11-14-XI-2016, J.E.Eger / 812ft., permit #271/2016 (1 F, FSCA).

Diagnosis. The male genitalia of *Parygrus guarani* are distinctive (Fig. 15); none of the other species (for which the genitalia are known) have a phallobase more than twice as long as the parameres in addition to parameres

with inner teeth. In both the males and females, the body is slender, parallel-sided, and narrowly tapered posteriorly (Fig. 14); nearly all of the other species are slightly narrowed anterior to the middle and widened at the posterior 1/3, and are broadly rounded at the elytral apices. *Parygrus angustatus* is similarly parallel-sided (Fig. 8), but it is much longer (7–8 mm) than *P. guarani* (less than 5.6 mm). Because of the very small number of specimens on hand, it is possible that the above external characters may not be reliable for diagnosing the species. The two females were assigned to this species due to their association with a male and/or their similar morphology; they are not designated as paratypes.

Description. Holotype male. Cuticle dark brown, legs, antennae and mouthparts lighter; slender, elongate, subparallel, elytra dorsally flattened along midline; length 5.50 mm (pronotum + elytra), width 1.90 mm, more than 2x as long as wide; body covered with erect and semi-erect, moderately long, golden setae and much shorter, recumbent setae (Fig. 14).

Head dark brown; punctures separated by 1x puncture diameter; setae moderately long; vertex flat; frons protruding slightly forward between antennal bases, anterior margin barely arcuate, distance between antennal bases less than length of antennomere 1. Antenna with antennomeres 1 and 2 dark brown, setose; antennomeres 3–11 yellow-brown, more densely setose; antennomere 1 slightly shorter than antennomere 2, antennomere 2 covering antennomeres 3–6. Clypeus densely setose, deeply punctate, margin nearly straight. Maxillary palpus with terminal palpomere slightly clavate, ventral face flat. Labrum emarginate, densely setose, bordered with dense fringe of short setae. Labial palpus with terminal palpomere dorsoventrally flattened, vaguely kidney-shaped with one side straight, one side curved; length shorter than that of terminal maxillary palpomere.

Pronotum dark brown; convex, disc weakly flattened at center; length 1.20 mm, width 1.55 mm, widest at basal 1/3 to 1/2; anterior margin straight except at strongly acute, depressed, anterolateral angles; lateral margins weakly arcuate, sinuate at base, narrowly margined, fringed with erect setae; posterior border trisinuate; posterolateral angles acute, moderately explanate. Disc evenly punctate, punctures separated by about 1x puncture diameter; setae moderately long. *Scutellum* dark brown, subcordate, wider than long; anterior margin strongly arcuate between two anterolateral notches; disc flat; punctation fine.

Elytron dark brown; length 4.30 mm, width 0.95 mm; flattened; little variation in width except at apical 1/3. Humeral angle rounded; lateral margin widened and shallowly sulcate at basal 1/3, entire length narrowly margined; apex acute. Disc punctate and shallowly striate; central disc with moderately deep, closely spaced, punctures; base and apex with punctures shallow, striae effaced; stria 9 at basal 1/3 with larger, deeper punctures; disc at anterior 3/4 flattened at midline between suture and interval 2, other intervals weakly convex; setae shorter than on pronotum, semi-erect and recumbent, uniformly distributed. *Hind wing:* Macropterous.

Legs. Profemur dark red-brown, covered with fine, evenly spaced punctures and long, recumbent golden setae; protibia red-brown, mostly bare and shiny, dorsal surface with sparse short setae and a few very long setae, ventral surface with dense row of short, stiff setae, arcuate with narrow spines at ventral apex; protarsus red-brown, shiny, dorsal surface with a few sparse, very long setae, ventral surface with dense, shorter setae, protarsomeres 4 and 5 each with a few much-longer dorsal setae. Mesofemur similar to profemur; mesotibia red-brown, mostly bare and shiny, dorsal surface with a few long setae, ventral surface with a patch of dense, short setae at apical 1/2, weakly arcuate with spinose ventral apex; mesotarsus similar to protarsus. Metafemur similar to pro- and mesofemur; metatibia weakly arcuate, setation like that of pro- and mesotibia; both metatarsi missing, but in the male paratype the metatarsi are similar to the pro- and mesotarsi. [Note: left metatarsus was lost after being imaged for Fig. 14.]

Venter dark brown; heavily setose. Prosternum with anterior border narrowly margined; prosternal process wide between procoxae, widest at midlength, lateral margins weakly arcuate, thickly margined; process with median longitudinal carina, bordered laterally by sulci, terminating in a low, elongate protuberance near apex. Metaventrite with intercoxal process margined and depressed; posterior disc weakly depressed at junction of sulcate metakatepisternal suture and metathoracic discrimen. Abdomen with some setae longer than on rest of body except legs; ventrite 1 with triangular intercoxal process weakly depressed between metacoxae, thickly margined laterally; ventrites 2–4 of equal length, finely and evenly punctate at center of disc, coarser laterally, punctures aligned with faint, transverse strigae; ventrite 5 longest, disc coarsely punctate, covered with long setae prominent at margins.

Genitalia. Aedeagus elongate (Fig. 15). Phallobase about 3x longer than parameres and wider than paramere bases together. Parameres each blade-like, inner surface concave; in dorsal view each with an inward-facing tooth near midlength; each paramere laterally sinuate, widest at base, narrowest near midlength, apex narrowly rounded; in lateral view aedeagus curved ventrally, each paramere wide, ventral surface nearly straight, dorsal surface weakly

arcuate, paramere tip narrowly rounded, deflexed ventrally. Penis nearly as long as parameres, in dorsal view basal width subequal to paramere base; parallel-sided to apical 1/3, then evenly narrowed to rounded apex.

FIGURE 14. *Parygrus guarani* **n. sp.**, male holotype; 5.50 mm long, 1.90 mm wide: a) dorsal habitus; b) lateral habitus.
FIGURE 15. *Parygrus guarani* **n. sp.**, male holotype genitalia: a) dorsal view; b) lateral view; c) ventral view.

Intraspecific variation. No significant non-sexual variation was noted among the small number of specimens, except that in the females the elytra are more convex in the posterior 1/2 than in the males. The two males, 5.30 and 5.50 mm long, are close in size to the two females, 5.45 and 5.55 mm long.

Geographic distribution. Known from only two localities in the departments of Cordillera and Itapúa, Paraguay (Fig. 3).

Etymology. This new species is named in honor of the *Guaraní*, an indigenous people who inhabit Paraguay and neighboring countries.

Parygrus lengua Barr and Shepard, new species

(Figs 3, 16, 17)

http://zoobank.org/8995529C-3873-46EC-B9F1-E030A1A07509

Type material. Holotype male. PARAGUAY. "PARAGUAY: Alto Paraguay / Puerto La Esperanza / 2 XII 2006 / Carlos Aguilar Julio // HOLOTYPE / Parygrus lengua / Barr & Shepard [red label, handwritten] // EMEC49557" (EMEC). **Paratypes (10 M). PARAGUAY.** PARAGUAY: Alto Paraguay / Puerto La Esperanza / 2 XII 2006 / Carlos Aguilar Julio (6 M, EMEC; 1 M, LSAM; 1 M, NHMUK; 1 M, USNM); PARAGUAY: Pdte. [Presidente] Hayes / Cruce los Pioneros / 20 I 1996 // Purchased from / Alfredo Ugarte (1 M, EMEC). All paratypes also have the following final label: PARATYPE / *Parygrus lengua* / Barr & Shepard [yellow label, printed].

Additional specimens examined (18; 3 M, 15 F). ARGENTINA. ARGENTINA: Entre Rios / Federacion / XII 2006 / Zubaron Gaston, leg. (3 M; EMEC). **PARAGUAY.** PARAGUAY: Alto Paraguay / Puerto La Esperanza / 2 XII 2006 / Carlos Aguilar Julio (10 F, EMEC; 2 F, FSCA; 1 F, LSAM; 1 F, NHMUK; 1 F, USNM).

Diagnosis. The male genitalia of *Parygrus lengua* **n. sp.** are distinctive (Fig. 17); none of the other species (for which the genitalia are known) have parameres both with inner ridges and without teeth. An external character not seen in other species is that the scutellum is weakly depressed at the anterior half and convex near the posterior angle. The females were assigned to this species due to their association with the males, their similar scutellar morphology, and body size; they are not designated as paratypes.

Description. Holotype male. Cuticle brown, legs, antennae and mouthparts lighter; elongate, subcylindrical; length 4.35 mm (pronotum + elytra), width 1.60 mm; body covered with erect and semi-erect, long, golden setae and much shorter, recumbent setae (Fig. 16).

Head dark brown; punctuation fine, dense, punctures separated by at least 1x puncture diameter; setae moderately long; vertex with moderately deep median depression; frons raised and protruding slightly forward between antennal bases, anterior margin arcuate, distance between antennal bases less than length of antennomere 1. Antenna with antennomeres 1 and 2 light brown, setose, antennomeres 3–11 yellow, densely setose; antennomere 1 nearly as long as antennomere 2; antennomere 2 covering antennomeres 3–5. Clypeus densely setose, coarsely punctate, barely emarginate. Maxillary palpus with terminal palpomere elongate, subcylindrical, weakly curved. Labrum emarginate, densely setose, border fringed with long setae. Labial palpus with terminal palpomere subrectangular, slightly flattened; length about 2/3 that of terminal maxillary palpomere.

Pronotum dark brown; weakly convex, disc weakly flattened at center; dark brown; length 0.90 mm, width 1.25 mm, widest at basal 1/3. Anterior margin straight except at strongly acute, depressed, anterolateral angles; lateral margins weakly arcuate, barely sinuate at lateral angles, narrowly margined, fringed with erect setae; posterolateral angles acute, explanate; posterior border trisinuate. Disc punctuation slightly coarser than on head; setae moderately long. *Scutellum* dark brown; subcordate, wider than long; anterior margin weakly arcuate between two anterolateral notches; disc weakly depressed at anterior 1/2, convex near posterior angle; punctation very fine.

Elytron red-brown; length 3.45 mm, width 0.80 mm; convex; narrowest at basal 1/3, widest at apical 1/3. Base depressed near margin; humeral angle rounded; lateral margin widened at basal 1/3, narrowly margined; apex acute. Disc strongly punctate and striate with deep, closely spaced punctures distinct from near base to apex, intervals weakly convex; setae slightly shorter than on pronotum, semi-erect and recumbent, uniformly distributed. *Hind wing:* macropterous.

Legs. Profemur red-brown, covered with fine, evenly spaced punctures and long, recumbent golden setae; protibia yellow-brown, mostly bare and shiny, dorsal surface with sparse, very long setae, ventral surface with dense

FIGURE 16. *Parygrus lengua* **n. sp.**, male holotype; 4.35 mm long, 1.65 mm wide: a) dorsal habitus; b) lateral habitus.
FIGURE 17. *Parygrus lengua* **n. sp.**, male genitalia: a) dorsal view; b) lateral view; c) ventral view.

row of short, stiff setae, weakly arcuate with narrow spines at ventral apex; protarsus yellow-brown, shiny, dorsal surface with sparse, very long setae, ventral surface with row of shorter, semi-erect setae, protarsomeres 4 and 5 each with a few much-longer dorsal setae. Mesofemur similar to profemur, mesotibia yellow-brown, ventral setae much longer than those of protibia, weakly arcuate with spinose ventral apex; mesotarsus similar to protarsus except ventral setae much longer. Metafemur and metatarsus similar to those of mesoleg, metatibia straight with spines at ventral apex.

Venter red-brown; heavily setose; finely to coarsely punctate. Prosternum with anterior border narrowly margined; prosternal process wide between procoxae, swollen over coxal bases, lateral margins weakly arcuate; process with median longitudinal carina terminating in a low, elongate protuberance near apex. Metaventrite with anterior process margined and depressed between mesocoxae; posterior disc depressed at junction of sulcate metakatepisternal suture and metathoracic discrimen. Abdomen with some setae longer than on rest of body except legs; ventrite 1 with triangular intercoxal process weakly depressed, margined laterally; ventrites 2–4 of equal length, finely and evenly punctate at center of disc, coarser laterally, aligned with faint, transverse strigae; ventrite 5 longest, disc coarsely punctate, covered with long setae prominent at margins.

Genitalia. Aedeagus moderately elongate (Fig. 17). Phallobase same length as parameres and same width as paramere bases together. Parameres each blade-like, inner surface concave; in dorsal view narrow, lateral margins nearly straight with a slight inward curve at midlength; in dorsolateral view sclerotized inner dorsal margin with short parallel ridges nearly perpendicular to margin; in lateral view each paramere wide, dorsal and ventral surfaces broadly arcuate, paramere tip acuminate and angled ventrally. Penis nearly as long as parameres, bottle-shaped, base constricted, basal 1/3–1/2 bulbous, apical 1/2 evenly tapered to narrowly rounded apex.

Intraspecific variation. The males from Paraguay vary from 3.85–4.45 mm long (n=5); females from 4.50–4.70 mm long (n=4). The three male specimens from Argentina are much larger (4.95–5.20 mm long), as are their genitalia, but otherwise differences between the groups are minor. Nevertheless, they have not been designated as paratypes. The morphology of the prosternal process is somewhat variable among all of the males examined. Some have the process swollen over coxal bases and not margined; others are not swollen, but margined and have the longitudinal carina bordered laterally by shallow sulci. Among males, the degree to which the protibiae are curved varies.

Distribution. Known from three localities in Argentina and Paraguay (Fig. 3).

Etymology. This new species is named in honor of the *Lengua*, one of the indigenous peoples who inhabited the Gran Chaco of northern Paraguay.

Parygrus quechua Barr and Shepard, new species

(Figs 2, 18, 19)

http://zoobank.org/223E963B-8100-4218-A586-FEFDB83734A8

Type material. Holotype male. BOLIVIA. "BOLIVIA, Sta.Cruz / 5kmSSE.BuenaVista, / HotelFlora&Fauna, / W63°39.13′ S17°29.92′ // UV& Hg vapor lights / 440m. Feb.6, 2007 / C.W.& L.B.O'Brien // HOLOTYPE / Parygrus quechua / Barr & Shepard [red label, handwritten] // EMEC49558" (EMEC). **Paratypes (9 M). BOLIVIA.** BOLIVIA: Santa Cruz / Buena Vista vic. / Flora&Fauna Hotel / 23-25/X/00, R.Morris (1 M, EMEC); BOLIVIA: Santa Cruz / Dpt. 4k SSE B. Vista / 22-25 November 2013 / Wappes & Skillman // Hotel Flora & Fauna / El 350-400meters / 17°29′ S 63°49′ W (1 M, FSCA); BOLIVIA: Sta. Cruz, / San Osteben [Opispo Santistevan] Prov., / Muyurina, 49 km N // Santa Cruz. XI-3-1959 / 1120 ft. R.B.Cumming // Property of Florida / State Collection of / Arthropods (3 M; FSCA) . **ECUADOR.** 0°40′36″S 76°24′2″W / ECUADOR: Napo, Yasuni Scientific / Station; 13.IV.1998; Coll: K.Will / 210m; Headlamping (in wet area; Will, in litt.) (1M, EMEC); ECUADOR: Napo Prov. / Yasuni Research / Station, 250m / 76°36′W, 0°38′S // 17-31.X.1998 / B.K.Dozier / Collector (1 M, FSCA). **PERU.** PERU: Madre de Dios / Tambopata Wldlf Res / 30 km SW Pto Moldonado [Maldonado] / 12°50′ S 69°20′ W 290m / 1-14 March 1983 / Joseph J. Anderson (2 M, EMEC). All paratypes also have the following final label: PARATYPE / *Parygrus quechua* / Barr & Shepard [yellow label, printed].

Additional specimens examined (6 F). BOLIVIA. BOLIVIA: Sta. Cruz, / San Osteben [Opispo Santistevan] Prov., / Muyurina, 49 km N // Santa Cruz. XI-3-1959 / 1120 ft. R.B.Cumming // Property of Florida / State Col-

lection of / Arthropods (4 F, FSCA). **ECUADOR.** ECUADOR: Prov. Napo / ca 10 air km E / Coca, on Rio Napo / 240 m III-8/9-86 / S. McKamey collr. (1 F, EMEC); 0°40′36″S 76°24′2″W / ECUADOR: Napo, Yasuni Scientific / Station; 13.IV.1998; Coll: K.Will / 210m; Headlamping (in wet area; Will, in litt.) (1F, EMEC).

Diagnosis. The male genitalia of *Parygrus quechua* **n. sp.** are distinctive (Fig. 19); none of the other species (for which the genitalia are known) have parameres with inner teeth at midlength and a phallobase subequal in length to the parameres. *Parygrus guarani* also has parameres with inner teeth at midlength, but the parameres are less than half as long as the phallobase (Fig. 15). Each of the six females were assigned to this species due to their association with males or on the basis of body size and general morphology, but are not designated as paratypes.

Description. Holotype male. Cuticle dark brown, legs, antennae and mouthparts lighter; elongate, moderately flattened; length 5.80 mm (pronotum + elytra), width 2.20 mm; body covered with erect and semi-erect, long, golden setae and much shorter, recumbent setae (Fig. 18).

Head dark brown; punctuation moderately fine, dense, punctures separated by about 1x puncture diameter; setae moderately long; vertex with shallow median depression; frons slightly protruding forward between antennal bases, anterior margin arcuate, distance between antennal bases less than length of antennomere 1. Antenna with antennomeres 1 and 2 red-brown, setose, antennomeres 3–11 yellow, densely setose; antennomere 1 and 2 lengths subequal 2; antennomere 2 covering antennomeres 3–5. Clypeus densely setose, coarsely punctate, broadly emarginate. Maxillary palpus with terminal palpomere elongate, subcylindrical, weakly curved and flattened. Labrum emarginate, densely setose, border fringed with long setae. Labial palpus with terminal palpomere subrectangular, slightly flattened; length about 1/2 that of terminal maxillary palpomere.

Pronotum dark brown; weakly convex, disc weakly flattened at center; length 1.25 mm, width 1.70 mm, widest at basal 1/3. Anterior margin straight except at strongly acute, depressed, anterolateral angles; lateral margins weakly arcuate, slightly sinuate at posterolateral angles, narrowly margined, fringed with erect setae; posterolateral angles acute, produced, explanate; posterior border trisinuate. Disc punctuation moderately fine, similar to that on head, punctures separated by about 1x puncture diameter; setae moderately long. *Scutellum:* dark brown; subcircular, slightly wider than long, anterior margin strongly arcuate between two anterolateral notches disc flat; punctation very fine.

Elytron dark brown; length 4.55 mm, width 1.10 mm; moderately flattened; nearly parallel-sided, narrowest at basal 1/3, widest at apical 1/3. Humeral angle rounded; lateral margin widened and shallowly sulcate at basal 1/3, entire length narrowly margined; apex acute. Disc strongly punctate and striate with deep, closely spaced punctures distinct from near base to apex, intervals weakly convex; setation similar to that of pronotum except for angulation, uniformly distributed. *Hind wing:* macropterous.

Legs. Profemur dark brown, covered with fine, evenly spaced punctures and long, recumbent golden setae; protibia red-brown, mostly bare and shiny, dorsal surface with sparse, very long setae, ventral surface of apical 1/3 with dense row of short, stiff setae; apical 1/3 strongly deflexed and swollen, ventral apex with granulate carina and narrow spines; protarsus red-brown, shiny, dorsal surface with sparse, very long setae, ventral surface with row of short, erect setae, protarsomeres 4 and 5 each with a few much-longer dorsal setae. Mesofemur similar to profemur; mesotibia red-brown, weakly arcuate with spines at ventral apex; mesotarsus similar to protarsus. Metafemur, and metatarsus similar to those of mesoleg, metatibia straight with spines at ventral apex.

Venter dark brown; heavily setose; finely to coarsely punctate. Prosternum with anterior border narrowly margined; prosternal process wide between procoxae, convex over procoxae, lateral margins weakly arcuate, narrowly margined; process with very low, rounded, median longitudinal carina terminating in a low, elongate protuberance near apex. Metaventrite with intercoxal process margined and depressed; posterior disc depressed at junction of sulcate metakatepisternal suture and metathoracic discrimen. Abdomen with some setae longer than on rest of body except legs; ventrite 1 with triangular intercoxal process weakly depressed, narrowly margined laterally; ventrites 2–4 of equal length, finely and evenly punctate at center of disc, coarser laterally, aligned with faint, transverse strigae; ventrite 5 longest, disc coarsely punctate, covered with long setae prominent at margins.

Genitalia. Aedeagus moderately elongate (Fig. 19). Phallobase same length as parameres and same width as paramere bases together. Parameres each blade-like, inner surface concave; in dorsal view each with an inward-facing tooth at midlength; in lateral view each paramere wide, ventral surface broadly arcuate, dorsal surface weakly sinuate, paramere tip broadly rounded. Penis nearly as long as parameres; bottle-shaped, bulbous at basal 1/2, narrowest just apical to teeth, subparallel to rounded apex.

Intraspecific variation. Males ranged from 5.20–6.00 mm long (n=10); females, 5.50–5.95 mm long (n=6).

FIGURE 18. *Parygrus quechua* **n. sp.**, male; 5.30 mm long, 2.05 mm wide: A) dorsal habitus; B) lateral habitus.
FIGURE 19. *Parygrus quechua* **n. sp.**, male genitalia: a) dorsal view; b) lateral view; c) ventral view.

Body color is quite variable among the examined specimens, ranging from dark brown to light red-brown. The holotype and others are mostly dark brown, whereas many are uniformly medium brown or red-brown, and some have the pronotum darker than the elytra. The lighter-colored individuals are likely teneral, having been collected at lights. Such a specimen is shown in Fig. 18. The eight Bolivian and Peruvian males have protibiae each with the apical 1/3 deflexed, swollen at the apex (Fig. 18), and with a ventral granulate carina; the two Ecuadorian males have the protibiae strongly arcuate rather than deflexed. The protibiae of females are arcuate and without ventral carinae. There is also variability in the shape of the pronotal posterolateral angle (produced or not) and the degree of prosternal process sculpturing.

Distribution. Bolivia, Ecuador and Peru (Fig. 2).

Etymology. This new species is named in honor of the speakers of the indigenous *Quechua* languages, the *Quechua* people, who inhabit the Andean countries of South America where this species occurs.

Parygrus zamuco Barr and Shepard, new species

(Figs 3, 20, 21)

http://zoobank.org/DE1B3D0C-5A2F-4175-8750-CE47331D2EEA

Type material. Holotype male. BOLIVIA. "BOLIVIA: Santa Cruz / El Cairo, 5 km W Buena / Vista, 16-18-X-2004 / J. E. Eger, UV light // HOLOTYPE / Parygrus zamuco / Barr & Shepard [red label, handwritten]" (FSCA). **Paratypes (24; 7 M, 17 F). BOLIVIA.** BOL. Cochabamba / Carrasco, El Sacta / 220 m., 26/X/02 / Morris/Wappes (1 F, FSCA); BOLIVIA: Santa Cruz / El Cairo, 5 km W Buena / Vista, 16-18-X-2004 / J. E. Eger, UV light (1 M, EMEC; 1M, 1 F, FSCA); BOLIVIA: Sta. Cruz, / San Osteben [Opispo Santistevan] Prov., / Muyurina, 49 km N // Santa Cruz. XI-3-1959 / 1120 ft. R.B.Cumming // Property of Florida / State Collection of / Arthropods (1 F, EMEC; 1M, 4 F, FSCA); BOLIVIA: Santa Cruz / 3.7km.SSE.Buena Vista / Hotel Flora & Fauna 430m / 17°29.949′S - 63° 33.152′W / 5-15-XI-2001, M C Thomas / trop.transition forest, BLT (1 F, EMEC); BOLIVIA: Santa Cruz / 3.7 km SSE Buena Vista / Hotel flora y fauna // 17°29′S 63°33′W / 23-30-April-2004; / A.R. Cline, MV&blacklight (2 F, CSCA); BOLIVIA: Dept. Santa Cruz, / 3.7km SSE Buena Vista / Hotel flora y fauna ~400m / 17°29′S 63°39′W; A. Cline // and J. Wappes collrs. / Ex: 23-30 APR-2004 / MV& BL (1 F, CSCA); BOLIVIA: Santa Cruz, 3.7 km SSW / Buena Vista, Hotel Flora y Fauna, / 1-12.V.2004, 17°29′S, 63°33′W, / Ex: MV/ Blacklight, Coll. A.R. Cline (1 F, CSCA); BOLIVIA: Santa Cruz / Dpt. 4k SSE B. Vista / 22-25 November 2013 / Wappes & Skillman // Hotel Flora & Fauna / El 350-400meters / 17°29′ S 63°49′ W (1 F, FSCA); BOLIVIA: Santa Cruz / Dpt. Huaico nr. Potrerillo / 21 November, 2013 / Wappes & Skillman // Elevation 430meters / MV/UV lights / 63°26′ W 17°40′ S (1F, FSCA); BOLIVIA: Santa Cruz / Potrerillos del Guendá; / 40km.NW. Santa Cruz / 17°40.3′S -063°27.4′W / 22-XI to 12-XII-2005 / B.K.Dozier (1 F, FSCA); BOLIVIA: Santa Cruz Dist. / Potrerillos del Guenda, Preserva / Natural, 17°40′S 63°27′W, 37m / 17-22-OCT-2007, A.R. Cline & J.E. / Wappes collr.; ex: bl/mv (1 F, CSCA); BOLIVIA: Santa Cruz / Potrerillo de Guandá / 16-22-XII-2004 / coll. E. Nearns, UV trap // macro. (1M, FSCA). **PARAGUAY.** PARAGUAY: Alto Paraguay / Puerto La Esperanza / 2 XII 2006 / Carlos Aguilar Julio (1M, EMEC); Concepción / San Alfredo / Tagatiyá / 24 X 2019 (1 F, EMEC). **VENEZUELA.** VENEZUELA: Guarico / Est. Exp. Nicolasito / UCV – Fagro / 8°8′20″N-66°24′32″W // 15-VI-2000, BL Trap / P.Freytag, M.Gaiani / Q.Arias collectors (1 M, EMEC; 1 M, FSCA). // All paratypes also have the following final label: "PARATYPE / *Parygrus zamuco* / Barr & Shepard" [yellow label, printed].

Diagnosis. The male genitalia (Fig. 21), with lateral expansions of the parameres at the apical 1/4, are unique among species for which the genitalia are known. In addition, both males and females of *Parygrus zamuco* **n. sp.** have distinguishing external characteristics: none of the other species have a row of extremely long setae on the dorsal mesotibia, nor maxillary palpi as long and robust (Fig. 20).

Description. Holotype male. Cuticle brown, legs, antennae and mouthparts lighter; elongate, subcylindrical; length 5.75 mm (pronotum + elytra), width 2.20 mm; body covered with erect and semi-erect, moderately long, golden setae and much shorter, recumbent setae (Fig. 20).

Head dark brown; punctures shallow, separated by 1–2x puncture diameter; setae moderately long; vertex with shallow median depression; frons protruding slightly forward between antennal bases, anterior margin truncate, distance between antennal bases more than length of antennomere 1. Antenna with antennomeres 1 and 2 light

brown, setose, antennomeres 3–11 yellow, densely setose; antennomere 1 shorter than antennomere 2, antennomere 2 covering antennomeres 3–6. Clypeus moderately setose and punctate, weakly emarginate. Maxillary palpus with terminal palpomere clavate, curved, very long, as long as clypeus. Labrum emarginate, moderately setose, bordered with fringe of long setae. Labial palpus with terminal palpomere vaguely triangular with 1 side straight, 1 side curved, ventral face slightly flattened; length nearly as long as that of terminal maxillary palpomere.

Pronotum dark brown; strongly convex, disc weakly flattened at center; dark brown; length 1.25 mm, width 1.65 mm, widest at basal 1/3; anterior margin straight except at strongly acute, depressed, anterolateral angles; lateral margins arcuate, sinuate at lateral angles, narrowly margined, fringed with erect setae; posterior border trisinuate; posterolateral angles barely acute, depressed. Disc punctuation similar to that of head, punctures separated by about 1x puncture diameter; setae moderately long. *Scutellum:* red-brown; subcircular; anterior margin strongly arcuate between two anterolateral notches; disc flat; punctation very fine.

Elytron red-brown; length 4.50 mm, width 1.10 mm; broadly convex; narrowest at anterior 1/3, widest at posterior 1/3. Humeral angle rounded; lateral margin widened and sulcate at anterior 1/3, entire length narrowly margined; apex acute. Disc strongly punctate and striate with deep, closely spaced quadrate punctures distinct from near base to apex, intervals weakly convex; setae shorter than on pronotum, semi-erect and recumbent, uniformly distributed. *Hind wing:* macropterous.

Legs. Profemur red-brown, covered with fine, evenly spaced punctures and long, recumbent golden setae; protibia yellow-brown, mostly bare and shiny, dorsal surface with numerous short and a few very long setae, ventral surface with dense row of short, erect setae, arcuate with narrow spines at ventral apex; protarsus yellow-brown, shiny, dorsal surface with a few sparse, very long setae, ventral surface with row of long setae. Mesofemur similar to profemur; mesotibia yellow-brown, mostly bare and shiny, dorsal surface with row of extremely long, golden setae, other surfaces with scattered, short setae, arcuate with spines at ventral apex; mesotarsus similar to protarsus except ventral setae much longer. Metafemur similar to pro- and mesofemora; metatibia straight (in lateral view) with spines at ventral apex, heavily and evenly setose, setae moderately long to very long; metatarsus similar to mesotarsus.

Venter red-brown, heavily setose. Prosternum with anterior border narrowly margined; prosternal process wide between procoxae, widest at midlength, convex over procoxae, lateral margins weakly arcuate; prosternal process with median longitudinal carina, bordered laterally by sulci, terminating in an elongate protuberance near apex. Metaventrite with intercoxal process margined and barely depressed; posterior disc depressed at junction of sulcate metakatepisternal suture and metathoracic discrimen. Abdomen with some setae longer than on rest of body except legs; ventrite 1 with triangular intercoxal process thinly margined laterally; ventrites 2–4 of equal length, punctures smaller at center of disc, coarser laterally, aligned with faint, transverse strigae; ventrite 5 longest, disc coarsely punctate, covered with long setae prominent at margins.

Genitalia. Aedeagus stout (Fig. 21). Phallobase about 1.5x longer than parameres and wider than paramere bases together. Parameres in dorsal view each laterally sinuate, widest at base, narrowest at midlength, widened at apical 1/4, then narrowed to rounded apex; in lateral view aedeagus strongly curved ventrally, each paramere wide, ventral surface nearly straight, dorsal surface weakly arcuate, paramere tip bluntly rounded. Penis more than 3/4 length of parameres, in dorsal view basal width subequal to paramere at midlength; evenly narrowed from base to broadly rounded apex.

Intraspecific variation. Males, 5.40–6.00 mm long (n=8), are smaller than females, 6.15–7.15 mm long (n=14). In both males and females there is variation between individuals in respect to the degree of prosternal process sculpturing. Extremely long mesotibial setae are present in both sexes, although the setation is reduced in two female specimens. Among males, the degree to which the protibiae are curved varies. Some of the specimens are much paler in color and are likely teneral, probably having been collected at lights.

Geographic distribution. Known from just a few localities in Bolivia, Paraguay and Venezuela (Fig. 3).

Etymology. This new species is named in honor of the *Zamuco*, also called the *Ayoreo*, one of the indigenous peoples who live in the northern Gran Chaco region of Bolivia and Paraguay where this species occurs.

Comments. The specimens from Venezuela are quite geographically disjunct from those collected in Bolivia and Paraguay (Fig. 3). Regardless, they are indistinguishable based on the male genitalia and external morphology. Females are readily identifiable as this species and the specimens examined have been designated as paratypes.

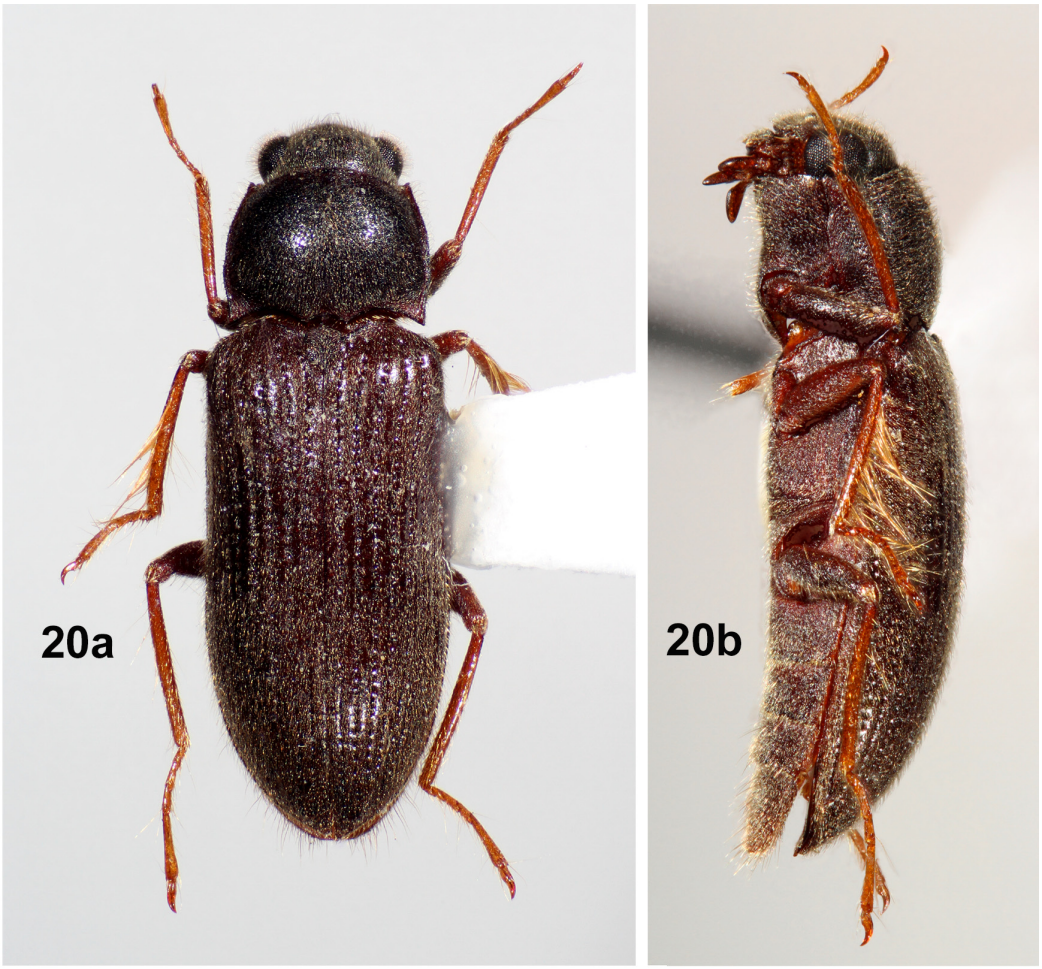


FIGURE 20. *Parygrus zamuco* **n. sp.**, male; 6.00 mm long, 2.15 mm wide: a) dorsal habitus; b) lateral habitus.
FIGURE 21. *Parygrus zamuco* **n. sp.**, male genitalia: a) dorsal view; b) lateral view; c) ventral view.

Preliminary key to the species of *Parygrus* based in part on male genitalia*

1 Pronotum with lateral margins widely explanate 2
– Pronotum with lateral margins not explanate 3
2 Body size large, longer than 6 mm . . . . . *P. parallelus* Grouvelle
– Body size smaller, 6 mm or shorter . . . . . *P. elateroides* Grouvelle
3 Elytral striae indistinct, punctures small and shallow; pronotum with weak longitudinal carina; body size large, longer than 6.5 mm including head. . . . . *P. angustatus* Grouvelle
– Elytral striae distinct, punctures large and deep; pronotum without longitudinal carina; body size variable 4

4 Male genitalia with parameres expanded laterally near apex; mesotibiae of both sexes usually with very long, golden setae . . . . . *P. zamuco* **n. sp.**
– Male genitalia with parameres not expanded laterally; mesotibiae lacking very long, golden setae 5
5 Parameres without teeth on inner surfaces, instead with small dorsoventrally aligned ridges; scutellum weakly depressed anteriorly and convex posteriorly . . . . . *P. lengua* **n. sp.**
– Parameres each with a small tooth on inner surface, without small ridges; scutellum not as above 6
6 Parameres with pair of teeth near apices 7
– Parameres with pair of teeth near midlength 8
7 Penis much shorter than parameres, not closely approaching teeth; parameres with apices acute in lateral view; elytral setae pale, fine, semi-erect; pronotum nearly as wide at apex as base . . . . . *P. maya* **n. sp.**
– Penis longer, nearly reaching paramere teeth; parameres with apices blunt in lateral view; elytral setae dark, coarse, erect; pronotum wider at base than apex . . . . . *P. erichsoni* Waterhouse
8 Phallobase about three times as long as parameres; body parallel-sided and tapered posteriorly . . . . . *P. guarani* **n. sp.**
– Phallobase same length as parameres; body not parallel-sided, widened at posterior 1/3 . . . . . *P. quechua* **n. sp.**

* This key is considered preliminary because three of the original species have not been examined by the authors and the male genitalia for those species are unknown.

Discussion

Morphology, physiology and habitat. The long, erect or semi-erect setae and the short, recumbent setae, completely covering *Parygrus* and the New World dryopid genera *Dryops*, *Microparnus*, *Onopelmus*, *Pelonomus*, and *Platyparnus*, are indicative of a semiaquatic lifestyle, which, in the case of *Parygrus* and *Pelonomus*, is lentic. Kodada *et al*. (2016) stated that vestiture of "... long, sparse, semi-erect and short, moderate to dense, recumbent hair-like setae [functions] to keep compressible gas gills." The members of these genera are therefore dependent on atmospheric oxygen for which they surface to replenish their air bubble. The adults of fully aquatic genera, such as *Helichus*, *Postelichus* Nelson, and *Elmoparnus* Sharp, have only plastron setae, which function to maintain an incompressible gas gill enabling them to utilize dissolved oxygen in the water.

All of the locality records we have for *Parygrus* place them in the lowlands, with none being from mountainous areas. The specimens we collected were from lentic waters such as roadside ditches or were attracted to lights. Among those we borrowed from collections, many of the labels indicated they had been collected at lights (blacklight, ultraviolet, mercury vapor, light traps). All of the specimens examined, where the wings were visible, were macropterous and therefore capable of dispersal flight.

Taxonomic history and conclusions. Clearly, we disagree with Hinton's (1936) opinion that *Parygrus* should be relegated to synonymy under *Helichus*. When Erichson (1847) described *Helichus*, he cited only the Nearctic species *H. lithophilus* (Germar) as an example of the genus. That species, which represented his generic concept of *Helichus*, is quite different from the species Waterhouse (1876) and Grouvelle (1890, 1896a, 1896b) subsequently attributed to *Parygrus*. Hinton (1936) termed *Parygrus* "stillborn" because Erichson (1847) failed to designate a type species. However, the International Code of Zoological Nomenclature (Ride *et al.* 1999) does not require that type species be assigned for generic names published before 1931 (Chapter IV. Article 12). When he erected *Parygrus*, Erichson (1847) noted that there were four undescribed species from South America, therefore no previously described species were attributable to the new genus. As a result, he did not designate a type species or mention a species by name. *Parygrus erichsoni*, described in 1876, was the first species attributed to the genus (Waterhouse 1876), therefore it is the type species by subsequent monotypy. Hinton (1936) was apparently unaware of this species when he stated that a species was not described in *Parygrus* until 1896. We were able to examine the type

specimen of *P. erichsoni* which is housed in the NHMUK (Fig. 5), and by comparison, we determined that the new species we propose in this article belong to *Parygrus*.

We had planned for this study to be more comprehensive, but we were unable to examine the types of all four of the original species. Although we were able to borrow the type of *P. erichsoni* housed in the Natural History Museum, London (NHMUK), the types of the other three described species from the Grouvelle Collection at the Paris Museum (MNHN) were not available for loan. As an alternative, we requested and received photographs of the types of *P. angustatus* and *P. elateroides* and their labels (Figs 8, 10). Unfortunately, the type of *P. parallelus* could not be found and is either missing or was not designated from among a series of specimens labeled by Grouvelle from the type locality. Instead we were provided with images of associated specimens from the collection (Fig. 11).

There are two specimens labeled as the type of *Parygrus angustatus*, one in the MNHN (Fig. 8) and the other in the NHMUK (Fig. 9). The true holotype is the MNHN specimen because the label data confirms that it is from the Grouvelle Collection, as in the species description (Grouvelle 1896a), whereas the NHMUK specimen bears a Fry Collection label. It remains a mystery as to why the determination label of the type states "*Dryops angustatus* Grouvelle," because Grouvelle described the species in *Parygrus* and did not mention *Dryops* in his paper.

Because our research was limited by the unavailability of three of the type specimens, for those species we have provided only general descriptions and preliminary diagnoses. The key to species, which includes both the original and new species, is likewise preliminary. Most importantly, however, we were able to examine the type specimen of *P. erichsoni* (Fig. 5)*,* the type species of the genus, and dissect the genitalia from an associated male specimen (Fig. 6). This enabled us to determine with certainty that none of our proposed new species are conspecific with the type species. Furthermore, from study of the original descriptions, images of the types and associated specimens from the MNHN, and examination of contemporary specimens from the NHMUK, we are convinced that the specimens we are describing as new are, indeed, undescribed.

Until now there has been no information, nor even mention, of the male genitalia in the literature. It is fortunate that males of the new species being described have fairly distinctive genitalia, which facilitates identification of males to species. The external morphologies of most of the new species are quite similar to each other, with small character differences that are often difficult to quantify. Furthermore, with only small series of specimens to study, one does not get a sense of normal variation within the species. Females may be identified by association with males, if only tentatively. In mixed-species samples from a single locality it may not be possible to identify the females to species with certainty. Because of this, we chose to designate as paratypes the females of only two of the five new species: *P. maya* **n. sp.** whose geographic range (Fig. 4) does not appear to overlap that of other species (Figs 2, 3), and *P. zamuco* **n. sp.** which has external characteristics (i.e., elongate maxillary palpi, long mesotibial setae) by which both males and females may be distinguished from other species (Fig. 20).

It is clear that a generic revision is needed for *Parygrus*. The description of the genus is over 170 years old (Erichson 1847) and the four previously described species date from 1876 to 1896. All of the descriptions are in the brief style of that time, are not illustrated, and the male genitalia are not mentioned. The five new species proposed in this article are the first to be described in *Parygrus* in over a hundred years. Certainly many more species are as yet undiscovered because of the wide geographic distribution of the genus in the Neotropics.

Acknowledgments

We are very appreciative of colleagues who provided us with additional specimens for this study, as well as those who otherwise assisted with this paper. We are particularly indebted to Christine Taylor (Natural History Museum, London, UK) for the photographic images and loan of the *Parygrus erichsoni* holotype and associated male, the loan of other historical specimens, and for permission to dissect genitalia. Specimens used in this study were loaned by the following curators and institutions: Roberta Brett and W. Pulawski (California Academy of Sciences, San Francisco, CA), Andy Cline and Martin Hauser (California State Collection of Arthropods, Sacramento, CA), Robert Sites (Enns Entomology Museum, University of Missouri, Columbia, MO), Victoria Bayless (Louisiana State Arthropod Museum, Louisiana State University, Baton Rouge, LA), Paul Skelley and Kyle Schnepp (Florida State Collection of Arthropods, Gainesville, FL), Charyn Michelli (U.S. National Museum of Natural History, Smithsonian Institution, Washington, DC), and Christine Taylor (Natural History Museum, London, UK). We are very grate-

ful for the photographic images of types and other historical specimens that were taken by Azadeh Taghavian-Azar (Muséum National d' Histoire Naturelle, Paris, France). Katrina Menard and Melissa Sadir (Sam Noble Museum, University of Oklahoma, Norman, OK), and Karen Wright and Edward Riley (Department of Entomology, Texas A&M University, College Station, TX), provided information about their collection holdings. Rachel Diaz-Bastin (California Academy of Sciences, San Francisco, CA) kindly photographed the male genitalia, and James Wilkins (Louisiana Sea Grant, Louisiana State University, Baton Rouge, LA) volunteered his photographic expertise to improve one of the figures. Tosha Walper (Pinole, CA) translated a section of old German text from the literature. We offer a round of applause for two collectors who shared their specimens with us: Carlos Aguilar Julio (Museo Nacional de Historia Natural del Paraguay, San Lorenzo, Paraguay) and Doug Post (California Department of Fish and Wildlife, Rancho Cordova, CA). Lastly, special thanks go to the reviewer whose thoroughness improved this article.

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