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Revision of the high Andean genus *Eremophygus* Ohaus
(Coleoptera: Scarabaeidae: Rutelinae: Rutelini)

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Revision of the high Andean genus *Eremophygus* Ohaus (Coleoptera: Scarabaeidae: Rutelinae: Rutelini)

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Abstract. The genus *Eremophygus* Ohaus, 1910 (Coleoptera: Scarabaeidae: Rutelinae: Rutelini), endemic to the Andean biogeographic region, is revised and now includes two altiplanic species: *Eremophygus lasiocalinus* Ohaus, 1915 and *Eremophygus philippii* Ohaus, 1910. A redescription of the genus and included species, diagnoses, distribution records, and a key to species are provided. Additionally, photographs of the type specimens are included. Based on examination of type specimens of all species-group names, *Eremophygus bicolor* (Gutiérrez, 1951) and *Eremophygus pachyloides* Ohaus, 1925 are **new synonyms** of *Eremophygus lasiocalinus*, while *Eremophygus leo* Gutiérrez, 1951 is a **new synonym** of *Eremophygus philippii*. Lectotypes are designated for *E. lasiocalinus*, *E. pachyloides*, and *E. philippii*. *Eremophygus philippii* is formally reported from Argentina.

Key words. Altiplano, Andean biogeographic region, ruteline, South America.

Resumen. El género *Eremophygus* Ohaus (Coleoptera: Scarabaeidae: Rutelinae: Rutelini), endémico de la región biogeográfica Andina, es revisado y ahora incluye dos especies altiplánicas: *Eremophygus lasiocalinus* Ohaus, 1915 y *Eremophygus philippii* Ohaus, 1910. Se proporciona una redescipción del género, diagnosis, registros de distribución y una clave para el reconocimiento de las especies. Adicionalmente se incluyen fotografías de los ejemplares tipo. Basado en el estudio del material tipo de todas las especies, se establece que *Eremophygus bicolor* (Gutiérrez, 1951) y *Eremophygus pachyloides* Ohaus, 1925 son **nuevos sinónimos** de *Eremophygus lasiocalinus* Ohaus, mientras que *Eremophygus leo* Gutiérrez, 1951 es un **nuevo sinónimo** de *Eremophygus philippii* Ohaus. Se designan lectotipos para *E. lasiocalinus*, *E. pachyloides* Ohaus y *E. philippii*. *Eremophygus philippii* es reportada formalmente para Argentina.

Palabras clave. Altiplano, región biogeográfica andina, rutelino, Sur América.

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Introduction

Eremophygus Ohaus, 1910, *Microogenius* Gutiérrez, 1951, and *Peruquime* Mondaca and Valencia, 2016 (Coleoptera: Scarabaeidae: Rutelinae: Rutelini), are genera that occur exclusively in the altiplano of Argentina, Bolivia, Chile, and Peru (Moore et al. 2017; Mondaca 2019). Species that comprise these genera are adapted to live at high elevations (3000–4500 m) under adverse climatic and biological conditions and are considered as endemic taxa of the biogeographic provinces of Paramo, Puna, and Prepuna of the Andean Region (Mondaca and Valencia 2016; Mondaca 2019).

Eremophygus was described by Ohaus (1910) based on *E. philippii* Ohaus, 1910 from Chile. Species of this genus are small in size (8.9–14.0 mm in length), with head, pronotum, and ventral portion of the body very setose. The antennae are small with 9 antennomeres in both sexes, three of which form the club. The elytra are partially setose, punctate, and rugose. The protarsal claws are simple, not toothed, and the clypeus is broadly rounded with the anterior margin variably reflexed vertically (Mondaca and Valencia 2016).

Eremophygus was poorly defined morphologically for a number of reasons. Some species that were formerly placed in the genus are currently classified in different genera and subfamilies within Scarabaeidae (Martínez 1975; Mondaca 2019). Species that were placed in this rarely-collected genus were based on very small series and only a single sex, further adding to the confusion. Therefore, the monophyly and validity of the genus was doubtful (Moore et al. 2017).

Eremophygus species are poorly represented in collections (Smith and Jameson 2001). The adults live at high elevations (3700–4100 m) in the high Andes where they occupy semi-arid highland environments made up of shrubby steppe vegetation and high grasslands. Nothing has been published on the immature stages, natural history, and phylogenetic relationships of this group of scarabs (Moore et al. 2017).

In this study, after examining all type and non-type material deposited in institutional and private collections, it was possible to obtain diagnostic characters for the two species recognized as valid, which are treated in this review.

The purpose of this paper is to provide a taxonomic review of the genus *Eremophygus*, establish three new synonyms based on the study of type specimens, and record formally *E. philippii* for the highlands of Argentina. Lectotypes are designed for *E. lasiocalinus* Ohaus, *E. pachyloides* Ohaus, and *E. philippii* Ohaus.

Materials and Methods

Twenty-three specimens of *Eremophygus* (including all primary types) were studied and photographed for this review from the following institutional and private collections:

ARCC Andrés Ramírez C. Collection, Santiago, Chile.

CMNC Canadian Museum of Nature, Ottawa, Ontario, Canada (Andrew Smith, François Génier).

JMEC José Mondaca E. Collection, Villa Alemana, Chile.

MNNC Museo Nacional de Historia Natural, Santiago, Chile (Mario Elgueta).

UCCC Museo de Zoología de la Universidad de Concepción, Concepción, Chile (Jorge Artigas).

VMDC Víctor Manuel Diéguez M. Collection, Santiago, Chile.

ZMHB Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany (Joachim Willers, Johannes Frisch).

Redescriptions and diagnoses are based on analyses of external morphological characters and male genitalia. All specimens were examined and dissected using a stereomicroscope (Olympus SZX7; 10–60x). Male genitalia and mouthparts were extracted by relaxing the specimens in hot water and then were glued on cardboard. Photographs were taken using a Nikon D300s camera.

The following definitions and standards were used in the descriptions and diagnoses: *Color* is based on dried, pinned specimens. *Body length* was measured dorsally along the midline from the apex of the clypeus to the apex of the elytra. *Body width* was measured at the widest point, typically at the middle of the elytra. *Puncture density* was defined as dense if punctures are nearly confluent to less than two puncture diameters apart, moderately dense if punctures are between two to six puncture diameters apart, and sparse if punctures are separated by more than six puncture diameters. *Puncture size* was defined as small if punctures were 0.02 mm or smaller, moderate if 0.02–0.07 mm, and large if 0.07 mm or larger. *Setae* were defined as sparse if there were few setae, moderately dense if the surface was visible but with many setae, and dense if the surface was obscured by setae.

For the description of the morphological structures, I follow the terminology used by Mondaca (2019).

Label data are quoted verbatim between (“ ”). A single slash (/) indicates a break between lines on the same label, and lowercase letters (a, b, c) indicate different labels. Geographic coordinates of the collecting sites were recorded using Google Earth Pro. The distribution map (Fig. 3) was generated by entering the geographical coordinates on the website www.simplemappr.net.

In order to provide nomenclatural stability of the taxa studied, lectotypes are designated for *E. lasiocalinus* Ohaus, 1915, *E. pachyloides* Ohaus, 1925 and *E. philippii* Ohaus, 1910 following the recommendation of article 72 of the International Code of Zoological Nomenclature (ICZN 1999).

Taxonomic History

Based on a small ruteline collected in northern Chile, Ohaus (1910) described *Eremophygus philippii* Ohaus, 1910 as a new genus and species of Rutelinae. Two other species, *Eremophygus lasiocalinus* Ohaus, 1915 and *Eremophygus pachyloides* Ohaus, 1925 were later described from Bolivia (Ohaus 1915, 1925), which together

with *E. philippii* were listed in *Genera Insectorum* (Ohaus 1934) and in the Blackwelder (1944) catalog. Almost 15 years later, Gutiérrez (1949) studied the genus *Eremophygus*, proposed a key to separate it from *Oogenius* Solier, 1851, and created the groups of species “*philippii*” and “*pachyloides*” based on the number of antennomeres of the adults, also providing a key to separate species of both groups and brief descriptions of each of them. Later, Gutiérrez (1951) described *Eremophygus leo* Gutiérrez, 1951 from northwestern Argentina, and placed it in the “*pachyloides*” group and provided a key that included this new species. In this same contribution, he described *Heterocallichloris bicolor* Gutiérrez, 1951 a Bolivian species that was relocated years later to the genus *Platycoelia* Dejean, 1833 (Rutelinae: Anoplognathini) by Machatschke (1965), and more recently in *Eremophygus* Ohaus, establishing the new combination *Eremophygus bicolor* (Gutiérrez, 1951) and the generic synonymy of *Heterocallichloris* Gutiérrez with *Eremophygus* (Smith and Jameson 2001). A year later, Gutiérrez (1952) described *Eremophygus calvus* Gutiérrez, 1952 also from Bolivia, which turned out to be the female of *Microogenius arrowi* (Ohaus) (Mondaca 2019). The last species described in this taxon was *Eremophygus pereirai* Martínez, 1960 from Argentina. This species was transferred to the genus *Cyclocephala* Dejean, 1821 (Dynastinae: Cyclocephalini) 15 years later by Martínez (1975) based on a reevaluation of the morphological characters. The totality of species attributed to *Eremophygus* was listed in the catalogs of Machatschke (1972) and Krajcik (2008, 2012). Moore et al. (2017) analyzed the taxonomic history of the “pelidnotine” scarabs, presented a provisional generic key, and an updated catalog for all “pelidnotine” genera and species. Finally, Mondaca (2019) reviewed the genus *Microogenius* Gutiérrez and included *Eremophygus* in a new key for the high Andean Rutelini genera.

Results

Genus *Eremophygus* Ohaus, 1910

Eremophygus Ohaus 1910: 21–22.

Type species. *Eremophygus philippii* Ohaus 1910: 22, by monotypy.

Synonym. *Heterocallichloris* Gutiérrez, 1951.

Heterocallichloris Gutiérrez 1951: 112–114. [Type species. *Heterocallichloris bicolor* Gutiérrez, 1951 by original designation]. [syn. by Smith and Jameson 2001: 105].

Gender. Masculine.

Species. Two species.

Diagnosis. Within the Rutelini, members of *Eremophygus* are diagnosed by the following characters: male with head, pronotum, scutellar shield, part of the elytra, and ventral portion of the body finely and moderately to densely setose; setae pale yellow, long (Fig. 4A, 4G, 5A, 5G); female mostly glabrous, with sparse, dorsal setation (Fig. 4D). Antenna small with 9 antennomeres in both sexes (Fig. 1A, 1B). Mentum oval or semicircular in shape with apex narrow anteriorly (Fig. 4L, 5F). Maxilla with galea apically lobed, unarmed (Fig. 1D) or with a small, basal tooth. Male with internal protarsal claw thickened and greatly recurved, simple, not toothed (Fig. 1F); mesotarsus and metatarsus with long and thin internal and external claws, claws slightly curved, simple, not toothed in both sexes. Pronotum with marginal bead complete. Elytra variably striate or rugose (Fig. 4A, 4D, 4G, 5A, 5G).

Redescription ($n = 18$ males, 5 females). Body length: 8.9–11.0 mm (male), 8.0–14.0 mm (female); width: 5.5–8.0 mm (male), 6.0–8.0 mm (female). **Color:** Dorsally unicolorous pale yellow or brown opaque (Fig. 5A, 5G) or bicolored with pronotum dark brown and elytra shiny reddish brown (Fig. 4A, 4D, 4G), legs pale yellow or brown. **Shape:** Elongate oval, convex, with the sides diverging towards the posterior end of the body; elytral apex broadly rounded. **Head:** Clypeus rounded apically, with margins variably reflexed vertically; dorsal surface flat or transversely elevated at base near frontoclypeal region, densely punctate and moderately setose; punctures moderate to large, with some fused. Frontoclypeal suture absent, hinted laterally. Frons flat or slightly convex in lateral view, with moderate to large, dense punctures. Eye canthus simple, not carinate. Eyes small and reniform laterally, interocular distance equals 5–6 eye diameters (Fig. 1C). Antenna with 9 antennomeres in both sexes, apical 3 antennomeres forming club (Fig. 1A, 1B); scape claviform; pedicel submoniliform; antennomere

3 subcylindrical or cupiform; 4 subquadrate or moniliform; 5 spatuliform; 6 discoidal; club with 3 antennomeres subequal or slightly longer than the funicule. Labrum horizontal, projected beyond clypeal margin, with apex medially rounded or emarginate, dorsally punctate and setose. Mandibles exposed in dorsal view, externally rounded or angled at middle, with inner border entire; apex rounded or obtuse; molar region poorly developed, with surface not striate. Mentum longer than wide, oval or semicircular in shape, with apex narrow anteriorly; surface flat, punctate and microstriate, moderately setose (Fig. 4L, 5F). Labial palps short, with 3 palpomeres; palpomere 1 shorter than 2; 3 fusiform, subequal to 1–2 together. Maxilla with galea smooth and setose, with or without small basal tooth (Fig. 1D). Maxillary palps with 4 palpomeres; palpomere 1 shorter than 2; 2 and 3 subequal, cupiform; 4 fusiform, longer than 2–3 together (Fig. 1D). **Pronotum:** Convex, with base of similar width to elytral base; anterior angles angulose or round, posterior angles broadly rounded; posterior margin sinuate laterally and basomedially round, marginal bead complete; surface variably punctate and setose; setae long moderate to dense. **Scutellar shield:** Subtriangular, longer than wide, with apex rounded; surface variably punctate, glabrous or moderately setose. **Elytra:** Together longer than broad, with dorsal surface variably striate and finely punctate-rugose or rugose, glabrous, or setose at base and on sides; elytral suture apically rounded or angled; humeral umbone with prominent round tubercle. **Pygidium:** Subtriangular, wider than long, apex round or slightly curved; surface almost flat or convex, punctate, setose; lateral and caudal margins with complete marginal bead. **Abdomen:** Sternite 1 short, medially subtriangular; 2–4 subequal in width; 5 wider than previous sternite

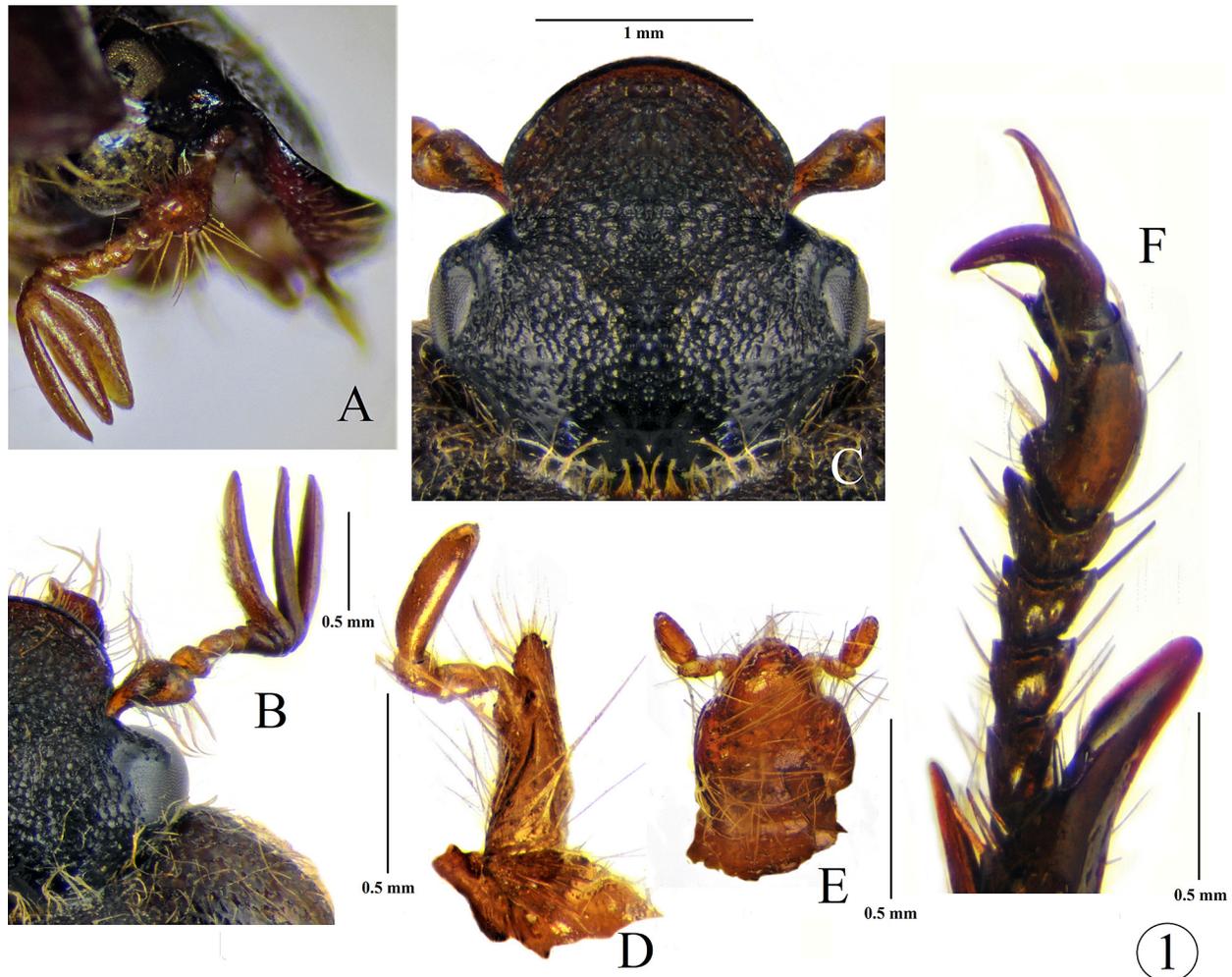


Figure 1. Detailed morphology of the genus *Eremophygus* Ohaus, 1910. A–B) Antenna. A) Female. B) Male. C) Head in dorsal view. D) Left maxilla, lateral view. E) Mentum, ventral view. F) Protarsus of male, lateral view.

(1.5 times); propygidium subequal to 5 with the apex slightly emarginate in both sexes; surface finely, sparsely punctate, with setiferous punctures in transverse rows. **Legs:** Protibia with 3 external teeth unequally separated; distal tooth elongate, externally curved, medial large, basal small; subapical spur variable in length, straight or slightly curved. Protarsomeres subtriangular, gradually wider and shorter distally; ventral border of tarsomere 4 with striate stridulatory area. Pro-, meso-, and metatarsal onychia each with 2 setae. Meso- and metatibiae flat with contiguous, unequal apical spurs, slightly curved and somewhat flat, with round or acute apices; apical border of meso- and metatibia with numerous spinules, spinules also appear on external surface forming oblique carinae. Protarsi of male with large, unequal claws; internal claw thicker, greatly recurved, simple, not toothed, with apex acute or round; outer claw long, slightly curved, with apex acute (Fig. 1F); meso- and metatarsal claws similar in size, simple, not toothed. **Male genitalia:** Aedeagus with parameres fused dorsoventrally; apex separated or not at middle (dorsal view), sinuous in lateral view (Fig. 4J, 4K).

Female (Fig. 4D, 4E). Slightly longer and wider than male, with oval and convex body. Clypeus semicircular with margins moderately reflexed vertically. Antenna with 9 antennomeres; club with 3 antennomeres. Protibia wide with large, rounded teeth; tarsi shorter with tarsomeres short and thick; pretarsal claws small, not toothed; inner pretarsal claws smaller than outer; meso- and metatarsal claws subequal. Meso- and metatarsal spurs unequal, short, wide, flat, distally round. Pygidium wide, distinctly convex in lateral view.

Distribution and habitats. *Eremophygus* species live at high elevations (3300–4100 m) in the altiplano (highlands) of Argentina, Chile, Bolivia, and Peru (Fig. 3). This distribution corresponds to the biogeographic province of the Puna of the Andean Region proposed by Morrone (2015). These scarabs occupy high-elevation, semiarid environments comprised of shrubby steppe vegetation and grasslands characteristic of the dry puna of South America (Fig. 2). The Rutelini fauna present in this region is unique and is composed of other endemic taxa such as *Microogenius arrowi* (Ohaus), *Microogenius puna* Mondaca, and *Peruquime arequipensis* Mondaca and Valencia, which are adapted to living under extreme biological and climatic conditions.



Figure 2. Andean habitat of *Eremophygus philippii* Ohaus in the Antofagasta Mountain range, Chile. Photo courtesy of Andrés Ramírez C.

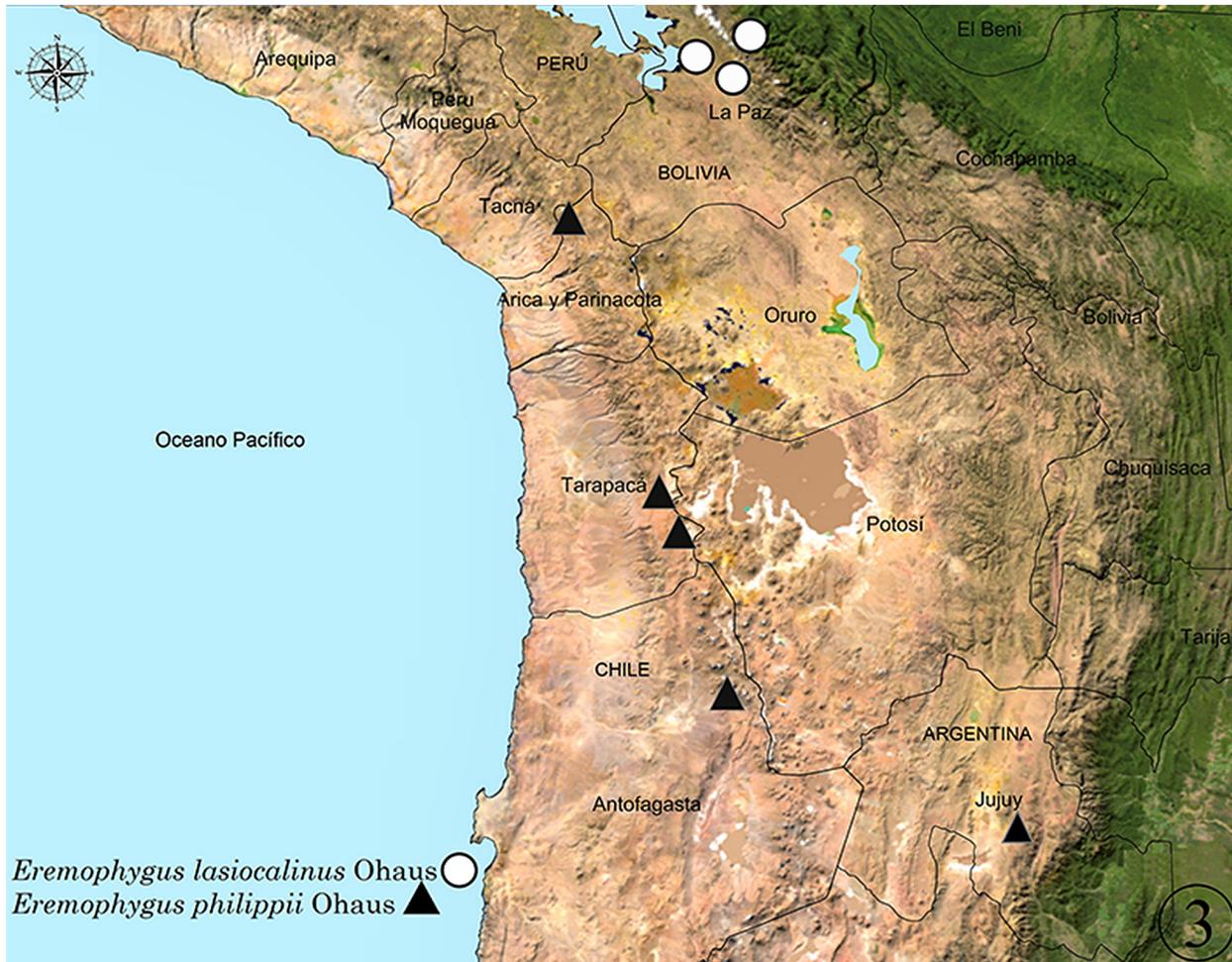


Figure 3. Geographical distribution of *Eremophygus* Ohaus species in the Andean region.

Natural history. Due to the difficulty in observing the species of *Eremophygus* in their natural environment, little is known about their immature stages, life cycles, and conditions of the habitat they occupy. Like other altiplanic rutelines (e.g., *Microogenius arrowi*, *M. puna*, and *Peruquime arequipensis*), the adults are diurnal and emerge during the rainy season (highland winter) that occurs between the months of December and April. Males have been observed flying during the morning at ground level among bushes and high grasslands. The adults live for a few weeks, during which they appear in large numbers to mate with the females that usually remain half-buried in the ground. The immature stages of these rutelines are unknown, possibly their larvae feed on roots and detritus as has been described and hypothesized for some species of *Oogenius* Solier and *Microogenius* Gutiérrez (Mondaca 2016, 2019).

Remarks. *Eremophygus* antennae are small with nine antennomeres in both sexes and the protarsal claws simple (not toothed) in both sexes. These characters are also present in the females of *Microogenius* (males with ten antennomeres and protarsal claws toothed), which caused Gutiérrez (1952) to erroneously place the female of *Microogenius arrowi* (described originally as *Eremophygus calvus*) in the genus *Eremophygus*.

Tribal classification. *Eremophygus* were placed in Rutelini by previous authors (Ohaus 1925, 1934, 1952; Gutiérrez 1950, 1951, 1952; Machatschke 1972; Smith and Jameson 2001; Krajcik 2008; Ratcliffe et al. 2015; Mondaca and Valencia 2016; Mondaca 2019), and this tribal-level classification has been maintained with some doubts by Moore et al. (2017). *Eremophygus* species were placed in Rutelini because the labrum is horizontally produced with respect to the clypeus, without a medial projection; antennae with 9 antennomeres (10 antennomeres in

Lasiocala Blanchard, *Microogenius* (except the female), *Peruquime*, and *Oogenius*); protibia tridentate, with inner protibial spur apical; protarsomeres not enlarged or densely setose ventrally; elytral margin simple, without a membranous border; and terminal spiracle positioned in pleural suture (Smith and Jameson 2001).

All valid species in the genus *Eremophygus* (except *E. pereirai* = *Cyclocephala pereirai*) have independently movable claws that are diagnostic of Rutelinae, also the apex of meso- and metatarsomere 5 have two weak, longitudinal slits (contrary to what was observed by Moore et al. 2017). Based on these morphological characters, *Eremophygus* must be classified in the tribe Rutelini until more detailed morphological and molecular studies are conducted.

Key to species of the genus *Eremophygus* Ohaus

1. Body dorsally bicolored, with pronotum and scutellar shield dark brown, elytra shiny reddish brown (Fig. 4A, 4G). Mentum semicircular in both sexes (Fig. 4L). Elytra with striae and punctures well defined; dorsal surface slightly rugose. Apex of the aedeagus divided at middle (Fig. 4K) *E. lasiocalinus* Ohaus
- Body dorsally unicolored, with pronotum and scutellar shield dark brown, elytra pale yellow or opaque brown (Fig. 5A, 5G). Mentum oval in male, semicircular in female (Fig. 4L, 5F). Elytra with striae and punctures obsolete; dorsal surface strongly rugose (Fig. 5A, 5G). Apex of aedeagus not divided at middle (Fig. 5D) *E. philippii* Ohaus

Species treatment

Eremophygus lasiocalinus Ohaus, 1915

(Fig. 4A–4L)

Eremophygus lasiocalinus Ohaus 1915: 76–77.

Type locality. “Bolivia, La Paz and Sorata”.

Type material. Lectotype male at ZMHB, labeled: a) “La Paz – Sorata” (typeset on white label), b) “Type” (typeset on red label), c) “*Eremophygus / lasiocalinus* Ohs.” (handwritten on red label), d) “LECTOTYPE ♂ / *Eremophygus / lasiocalinus* Ohaus, 1915 / Det. J. Mondaca E. 2021” (typeset on red label).

New synonym. *Heterocallichloris bicolor* Gutiérrez 1951: 114–115 [original combination]. Type locality: “Bolivia, Alto La Paz”.

Platycoelia bicolor (Gutiérrez) [new combination by Machatschke 1965: 60].

Eremophygus bicolor (Gutiérrez) [new combination by Smith and Jameson 2001: 105].

Type material. Holotype male at UCCC, labeled: a) “HOLOTIPO ♂” (typeset on red label), b) “Bolivia 14-XII-48 / Alto La Paz / 4100 ms. Kuschel” (typeset on white label), c) “*Heterocallichloris / bicolor*. Gutier. / R. Gutiérrez-Det.49” (typeset and handwritten on white label), d) “*Eremophygus / bicolor* (Gutiérrez) / Det. A.B.T. Smith 1999”.

New synonym. *Eremophygus pachyloides* Ohaus 1925: 76. Type locality: “Bolivia, Songo”.

Type material. Lectotype female at ZMHB, labeled: a) “♀” (typeset on white label), b) “Songo / Bolivia” (typeset on white label), c) “*Eremophygus / pachyloides* Ohs.” (handwritten on red label), d) “Staugr.” (typeset on white label), e) “Type” (typeset on red label), f) “LECTOTYPE ♀ / *Eremophygus / pachyloides* Ohaus, 1925 / Det. J. Mondaca E. 2021” (typeset on red label).

Diagnosis ($n = 8$). Body length: 11–14 mm. Male. Body bicolored with head, pronotum, and scutellar shield dark brown with green reflections and with dense, long, tawny setae. Elytra reddish brown or shiny castaneus, with dorsal surface densely, finely punctate and rugose, with some sparse setae (Fig. 4A, 4G). Clypeus rounded, with anterior margin moderately reflexed vertically. Mentum semicircular, slightly convex and moderately setose, with anterior portion projected anteriorly (Fig. 4L). Pronotum setose, with long, fine, and moderately dense, pale yellow setae; punctures similar in size, mostly absent along midline. Aedeagus with apex bilobulate, divided at middle (dorsal view) (Fig. 4K).

Female ($n = 1$). Slightly longer and wider than male (14 mm), with integument dark reddish brown. Body ovate and convex, mostly glabrous, with few dorsal setae (Fig. 4D, 4E). Clypeus semicircular, with anterior and lateral margins less elevated vertically. Mentum semicircular (Fig. 4L). Antennae with 9 antennomeres (Fig. 1A).

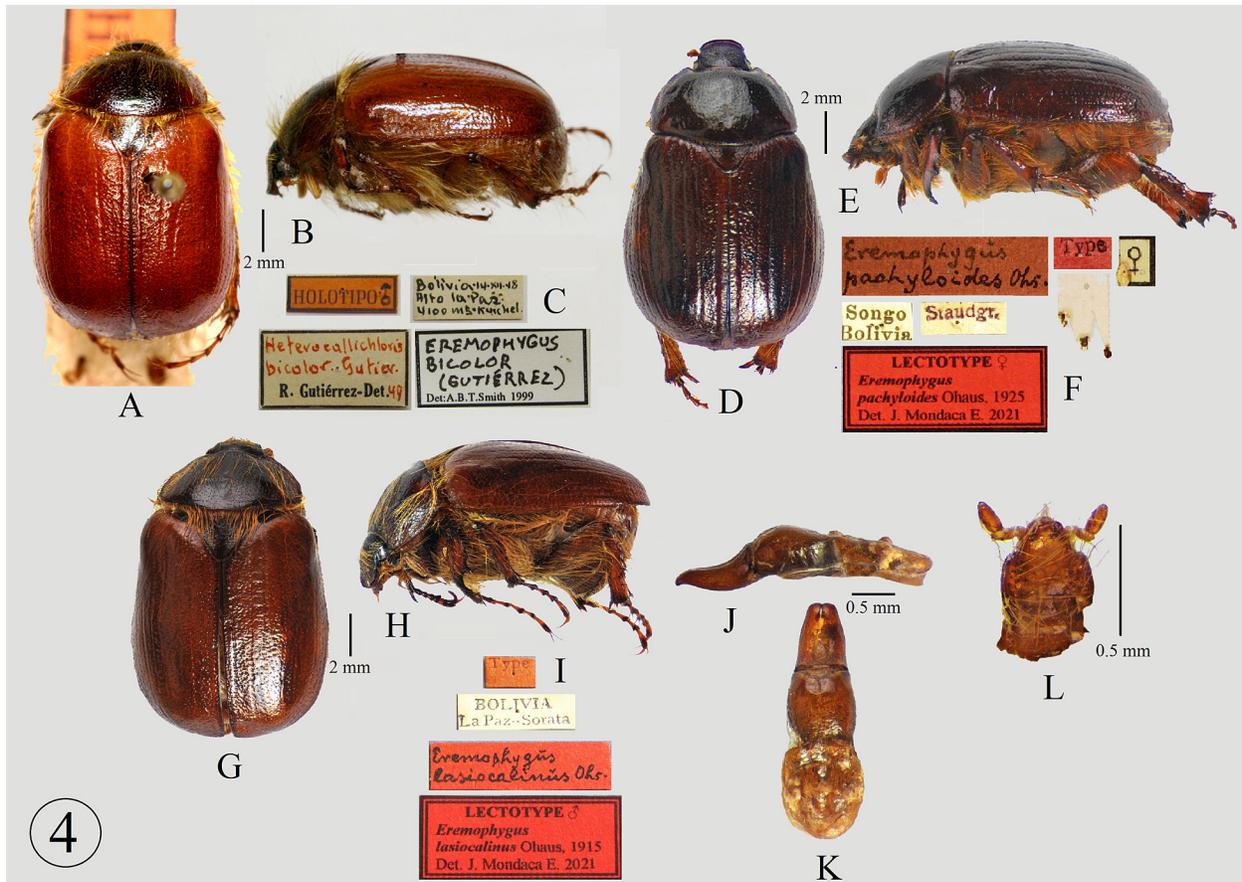


Figure 4. *Eremophygus lasiocalinus* Ohaus. A–C) Male holotype of *Eremophygus bicolor* (Gutiérrez) (= *E. lasiocalinus*). A) Habitus, dorsal view. B) Habitus, lateral view. C) Labels. D–F) Female lectotype of *Eremophygus pachyloides* Ohaus (=female *E. lasiocalinus*). D) Habitus, dorsal view. E) Habitus, lateral view. F) Lectotype labels, egg, and mouthparts. G–L) Male lectotype of *Eremophygus lasiocalinus* Ohaus. G) Habitus, dorsal view. H) Habitus, lateral view. I) Labels. J–K) Aedeagus. J) Lateral view. K) Dorsal view. L) Mentum.

Protibia wide, with lateral teeth large and rounded distally; protarsal claws small, not toothed; inner protarsal claws smaller than the outer; tarsomeres short and thick.

Distribution. Bolivia, Departamento de La Paz (Fig. 3).

Material examined. BOLIVIA (8). Departamento de La Paz (8). Alto La Paz, 14-XII-1948, Kuschel (1 UCCC); 15-XII-1955, Alvarenga leg. (5 CMNC); La Paz – Sorata (1 ZMHB); Songo [Zongo] (1 ZMHB).

Temporal data. Based on label data, this species is active in December.

Remarks. Due to the bicolored body, this species has been confused with *Microogenius puna* Mondaca, a species recently described from the altiplano of Chile and Peru (see Mondaca 2019). *Eremophygus lasiocalinus* is a species endemic to Bolivia that differs from *M. puna* by having all pretarsal claws simple, not toothed, and antennae composed by 9 antennomeres in both sexes, unlike the protarsal claws of *M. puna*, which are toothed in males and simple in females, in addition to the antennae composed of 10 antennomeres in males and 9 antennomeres in females. These sexual differences are typical of the genus *Microogenius* which was the reason why Gutiérrez (1952) assigned *Eremophygus calvus* (now female of *M. arrowi*) to the genus *Eremophygus*.

Some observations and comments made by Moore et al. (2017) regarding *E. lasiocalinus* are not correct, since they are based on the morphology of *Microogenius puna* Mondaca (e.g., *E. lasiocalinus* has the protarsal

claw enlarged and deeply split; the meso- and metatarsal claws may be deeply split or simple; text taken from Moore et al. (2017) and corresponds to the characters of *Microogenius puna*.

Natural history. This species is diurnal and emerges during the rainy season in the high Andean habitats of Bolivia. The immature stages of this species are unknown. Collection records indicate its presence at 4100 m. Most of the known specimens of this species were collected between 1948–1955 in El Alto (a metropolitan area of La Paz), which is the second most populated city in Bolivia. It is likely that the natural environments that existed more than 70 years ago in what is now El Alto no longer exist due to the explosive growth of the city.

Eremophygus philippii Ohaus, 1910

(Fig. 5A–5I)

Eremophygus philippii Ohaus 1910: 22.

Type locality. “Chile”.

Type material. Lectotype male at ZMHB, labeled: a) “PERU” (typeset on white label), b) “Typus!” (typeset on red label), c) “Eremophygus / philippi Ohs.” (typeset on red label), d) “LECTOTYPE ♂ / *Eremophygus / philippii* Ohaus, 1910 / Det. J. Mondaca E. 2021” (typeset on red label).

New synonym. *Eremophygus leo* Gutiérrez 1951: 106. Type locality: “Argentina, Jujuy”.

Type material. Holotype male at UCCC, labeled: a) “HOLOTIPO ♂” (typeset and handwritten on red label), b) “Argentina / Jujuy XII-42 / J.M. Bosq. leg.” (handwritten on white label), c) “Eremophygus ♂ / leo. Gutierrez / R. Gutiérrez-Det. 49” (typeset and handwritten on white label), d) “6105” (handwritten on white label).

Diagnosis. ($n = 12$). Body length: 8.9–10.0 mm. Male ($n = 4$). Body unicolored, with head, pronotum, and scutellar shield dark brown; elytra, venter, and legs pale yellow to brown (Fig. 5A, 5G). Clypeus broadly rounded,

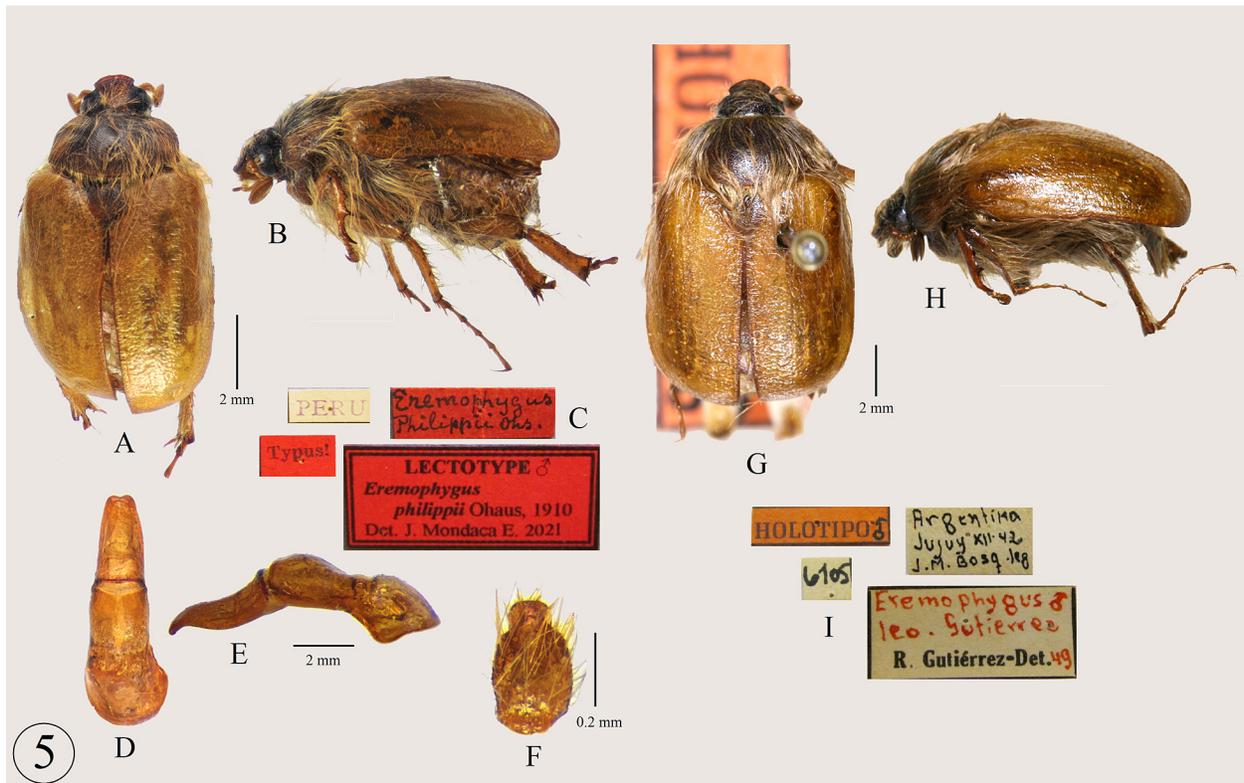


Figure 5. *Eremophygus philippii* Ohaus. A–F) Male lectotype of *Eremophygus philippii* Ohaus. A) Habitus, dorsal view. B) Habitus, lateral view. C) Labels. D–E) Aedeagus. D) Dorsal view. E) Lateral view. F) Mentum, ventral view. G–I) Male holotype of *Eremophygus leo* Gutiérrez (= *E. philippi*). G) Habitus, dorsal view. H) Habitus, lateral view. I) Labels.

with margins slightly reflexed vertically (Fig. 1C). Mentum oval, apex narrow anteriorly, surface flat, moderately punctate and setose (Fig. 5F). Maxilla with galea smooth and setose, without basal tooth (Fig. 1D). Pronotum wide with anterior angles expanded laterally; surface densely, finely punctate and setose; setae long, moderate to dense (Fig. 5A, 5G). Scutellar shield subtriangular, surface finely, densely punctate, moderately setose. Elytral surface densely, finely punctate and rugose with some sparse setae. Aedeagus with apex bilobulate, not divided at middle (dorsal view) (Fig. 5D).

Female. ($n = 4$). Slightly longer and wider than the male, integument brown. Body ovate and convex, mostly glabrous, with few dorsal setae. Clypeus semicircular with anterior and lateral margins slightly elevated vertically. Mentum semicircular in shape with apex narrow anteriorly. Antennae with 9 antennomeres. Protibia wide with lateral teeth large and rounded distally; protarsal claws small, not toothed; inner protarsal claws smaller than the outer; tarsomeres short and thick.

Distribution. Argentina (Provincia de Jujuy) and Chile (Arica y Parinacota, Tarapacá, and Antofagasta regions) (Fig. 3). There are literature records from “Peru” (Ohaus 1952; Ratcliffe et al. 2015) but this record originated from uncertain and vague data label and needs to be further verified with additional specimens.

Material examined. Argentina (1). Provincia de Jujuy (1). Jujuy, XII-1942, J.M. Bosq leg. (1 UCCC). Chile (14). Región de Arica y Parinacota, Provincia de Parinacota (1). Volcán Tacora, I-1990, col. S. Ruiz (1 MNNC). Región de Tarapacá, Provincia de Tamarugal (13). Salar de Coposa, 6-XI/16-XII-1993, col. V. Tello (2 JMEC), 10-XI/16-XII-1993, pitfall-trap (2 MNNC); Salar de Huasco, 6-XI/16-XII-1993, col. V. Tello (2 JMEC, 6 VMDC, 2 MNNC), 24-III-2003, col. J. Mondaca E. (1 JMEC). Región de Antofagasta, Provincia El Loa (1). Quebrada de Pariri, E. de Chiu-Chiu, 3300 m, 18-III-2021, 22°8'25"S, 68°15'51"O, col. A. Ramírez C. (1 CARC).

Temporal data. January (1), March (2), November-December (14), December (1).

Remarks. As a result of the study of the male holotype of *E. philippii*, it is established that this species is conspecific with the male holotype of *E. leo*.

Even though *E. philippii* was described from “Chile”, the male holotype carries a label that says “PERU”. I am assuming that “Chile” is correct since this was stated in the original description (Ohaus 1910), and there have been several specimens collected in northern Chile since then (while none have been collected in Peru). This altiplanic species was cited from Peru by Ohaus (1952) (and later by Ratcliffe et al. (2015), based on the same record) in the work *Beiträge zur Fauna Perus*, who states: “The only known specimen of this species was found on a trip in the highlands between 3000–4000 m”. However, there is uncertainty about the original collecting locality of this specimen with regards to current territorial boundaries of Peru and Chile. It is possible that this species inhabits both Peru and Bolivia, countries that together with Argentina and Chile share a wide Andean territory known as “Altiplano”, but this needs to be verified using voucher specimens with precise collecting data.

The majority of specimens found in northern Chile were collected with Barber traps installed in the altiplanic steppe composed of shrubby vegetation and grasslands located in the Huasco and Coposa salt flats (Region de Tarapacá).

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