



Two new species of South American Glaresidae (Coleoptera: Scarabaeoidea)

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Abstract

Two new species of South American Glaresidae (Coleoptera: Scarabaeoidea) are described: *Glaresis smithi* Paulsen, **new species** from Argentina, and *Glaresis mondacai* Paulsen, **new species** from Chile and Peru. The species are compared to their closest congener, *Glaresis fritzi* Martínez *et al.*, and a key is provided for the known South American species of the genus *Glaresis* Erichson.

Key words: Coleoptera, taxonomy, enigmatic scarab beetle

Introduction

Species of *Glaresis* Erichson (Coleoptera: Glaresidae) are small scarabaeoids that are found in sandy habitats nearly worldwide (Ratcliffe & Paulsen 2008). Widespread species are often associated with sandy riverbanks, while other species are restricted to individual dune systems. It is not uncommon for more than one species to occur together. The larvae are unknown for the family, thus it is merely conjecture that the group feeds on interstitial detritus or debris among sand grains. Adults of known species are active flyers after dusk and are readily attracted to ultraviolet light. A small blacklight, whether simply placed in the center of a white cotton sheet on the sand or placed protruding from a white plastic bucket buried to its rim, is frequently all that is required to collect *Glaresis* specimens in good numbers.

North American *Glaresis* were revised by Gordon (1970), and Argentinian species were discussed by Gómez (2008). Gordon and Hanley (2014) recently revised the Western Hemisphere taxa. In that work, 31 species were recognized, including two from South America: *Glaresis pardoalcaidei* Martínez, Pereira, and Vulcano from Argentina, Brazil, Bolivia, and Paraguay and *G. fritzi* Martínez, Pereira, and Vulcano from Argentina. In the same year, Mondaca (2014) reported the first record of the family from Chile as *G. fritzi*. In this paper the South American species of *Glaresis* are reviewed. Two new species are described from Argentina, Chile, and Peru and illustrated and compared to the previously known South American taxa. This brings the total number of *Glaresis* species known from South America to four.

Although it is treated in Gordon & Hanley (2014), *G. fritzi* cannot be identified in the key to *Glaresis* species groups in that work. The first couplet of the key results in choices leading to *G. pardoalcaidei* or species from North America, between which *G. fritzi* is left unaccounted. For this reason a new key is provided for distinguishing the currently known South American species. Additional sampling in South America, especially in isolated dunes or sandy habitats, will almost certainly result in the discovery of more undescribed species.

Materials and methods

Material studied. Initial loans for this project were undertaken within the framework of the study of the scarabaeoids of southern South America with Andrew Smith (CMNC), and specimens were continually accrued over many years, but the *Glaresis* treatment was delayed while other projects were completed. This has resulted in

a large number of South American specimens available for study, including 160 specimens from the institutions and collections listed here.

CJME	Jose Mondaca E. Collection, Santiago, Chile
CMNC	Canadian Museum of Nature, Ottawa, Ontario, Canada
FSCA	Florida State Collection of Arthropods, Gainesville, Florida, United States of America
LEMQ	Lyman Entomological Collection, McGill University, Montreal, Quebec, Canada
MACN	Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina
MJPC	M.J. Paulsen, Lincoln, Nebraska, United States of America

Family Glaresidae Kolbe, 1905: 543

Genus *Glaresis* Erichson, 1848: 925

Type species. *Glaresis rufa* Erichson, 1848, by monotypy.

Species covered. The species treated here are the South American species attributable to the *Glaresis inducta* group in Gordon & Hanley (2014). Although *G. fritzi* was noted at that time to be the only species in the group that possessed teeth on the metatrochanter and metafemur, both of the new species described here are similarly armed. They differ from all members of the species group except *G. arenata* Gordon from California, United States of America, in having the tubercles at the setal bases on the elytral striae more rounded than linear. The only change necessitated to the description of the species group to accommodate the new species is that the external median tooth of the mesotibia, referred to as a postmedian lateral protuberance, can no longer be considered to be present in all species.

Glaresis fritzi Martínez, Pereira, and Vulcano, 1961: 77

Figs. 1, 4, 7.

Type locality. ARGENTINA: Río Negro: Lamarque.

Type depository. MACN. Holotype, allotype images studied; 17 paratypes studied from CMNC.

Description. Length 2.4–3.8 mm, width 1.2–2.0 mm. Color pale to dark yellowish brown (Fig. 1). Head with surface of clypeus and frons with small tubercles; tubercles separated by > 3 diameters. Clypeal apex emarginate, margin beaded (raised) and anteriorly crenulate, lateral angles not dentate. Mandible with apex and internal tooth strong, external lobe near base rounded. Pronotum transversely depressed in anterior $\frac{1}{4}$ and subfoveate at lateral $\frac{1}{4}$ of depression; median longitudinal furrow extending from transverse anterior depression to base; lateral fovea present on each side at middle near lateral margin. Pronotal surface with setae-bearing, elongate tubercles, occasionally conjoined anteriorly; setae decumbent, $\frac{1}{2}$ length of tubercles; basal pronotal margin crenulate, especially at posterior angle, and produced before scutellum. Elytra with striae almost weakly convex, with subtriangular, posteriorly directed tubercles at setal bases; seta distinct, length greater than or equal to width of rectangular punctures of intervals. Metasternum with external ridge of metatibial furrow weakly indicated to obsolete, internal ridge of furrow always obsolete. Mesotibia externally with 5–6 spines in distal half, distinctly projecting at middle at bases of spines 1–2 (appearing dentate at middle); apex rounded. Metatrochanter posterior margin crenulate with largest, usually rectangular, tooth near metafemur; superior surface unarmed. Metafemur with large tooth near trochanter, superior surface unarmed; externally with tuberculate carina from median projection not extending onto ventral surface (Fig. 4). Metatibia triangular, external margin distinctly projecting at middle (Fig. 7).

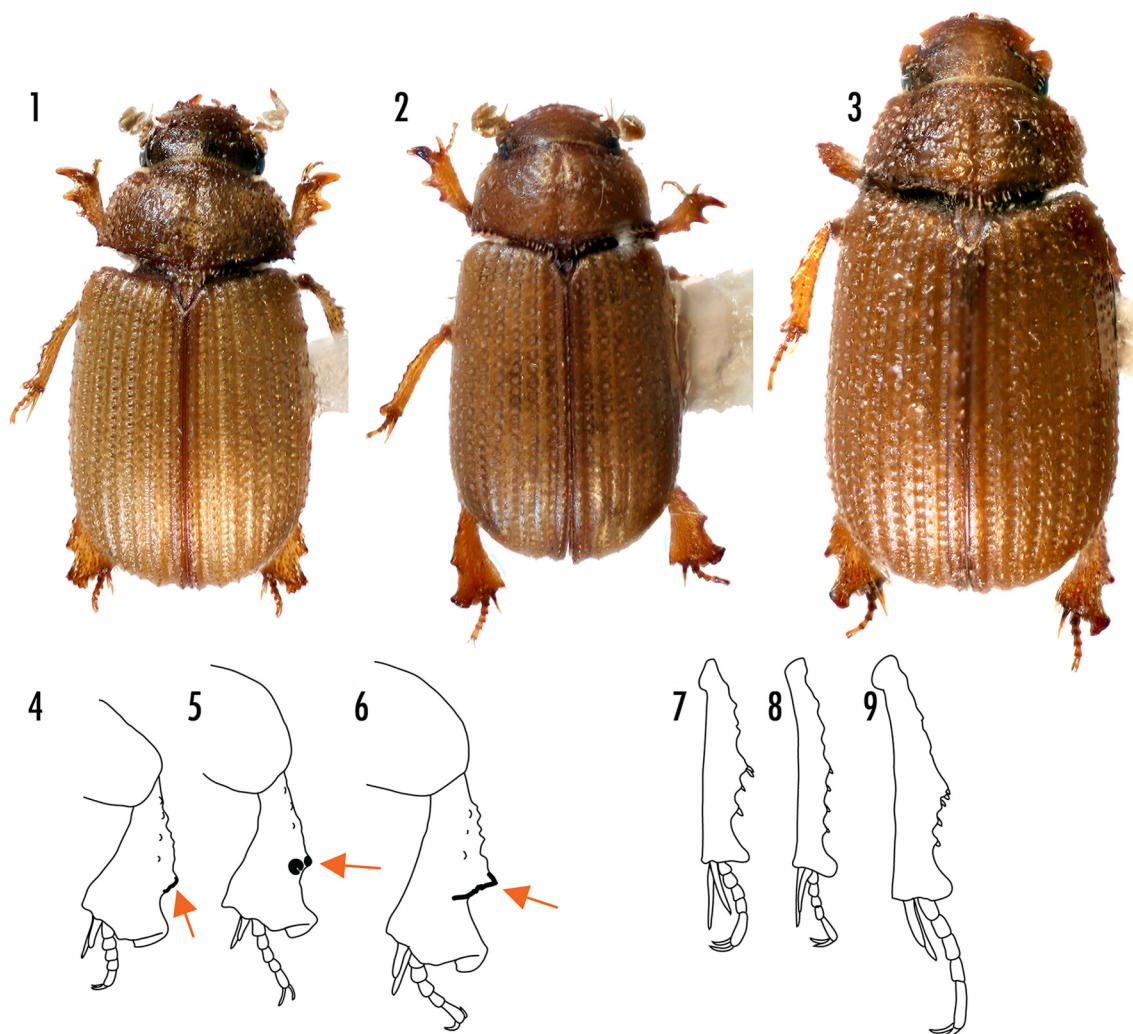
Temporal distribution. November (8), December (12), January (55), February (2).

Distribution (Fig. 10; $n = 77$). ARGENTINA: **Cordoba:** Guanaco Muerto/Cruz del Eje. **Mendoza:** 40 km N San Rafael. **Río Negro:** Lamarque. **San Luis:** 18 km S Arizona; San Geronimo. Paratype localities from Martínez *et al.* (1961), specimens not studied: **Catamarca:** Fte. El Quemado; La Ciénaga/Belén.

The *G. fritzi* holotype and allotype are labeled 1959, but the original description lists specimens from 1957 and

1958. It appears that specimens from 1959 are also part of the type series and the text was in error. Mondaca (2014) listed the species from Chile, but those specimens are actually a similar species that is described below as new, and *G. fritzi* does not occur in Chile.

Remarks. This species has more distinctly costate elytra, with the strial tubercles more elongate and thus appearing somewhat triangular instead of simply round. Despite this, the tubercles are still quite short and not at all linear as in the majority of North American species. Further distinguishing characters are discussed in the treatments for the new species described below.



FIGURES 1–3. Dorsal habitus of South American species of the *Glaresis inducta* group. 1) *G. fritzi*, 2) *G. smithi*, 3) *G. mondacai*.

FIGURES 4–6. Right metatibia, ventral view, with arrows indicating median projection and associated carina and tubercles: 4) *G. fritzi*, 5) *G. smithi*, 6) *G. mondacai*.

FIGURES 7–9. Right mesotibia, ventral view: 7) *G. fritzi*, 8) *G. smithi*, 9) *G. mondacai*.

Glaresis mondacai Paulsen, new species

Figs. 3, 6, 9.

Type locality. PERU: Tacna: Las Yaras.

Type series. Holotype female, deposited at CMNC, labeled: a) “PERU, Tacna / Las Yaras, 400m / 6.XI.1983, L. Peña”; b) on red paper, “*Glaresis mondacai* / ♀ Paulsen / HOLOTYPE”. Three paratypes, (2 LEMQ, 1 MJPC; sex indeterminate, abdomens missing), data as holotype. One male paratype (CJME): “CHILE PROV. ARICA / Valle de Lluta / 2-III-2007 / col. C. Valdés”; b) “Trampa luz negra / 18°24'33,97" S. / 70°15'56,68" O. / 124 msnm”. One female paratype, (CJME) labeled: a) “CHILE PROV. ARICA / Ciudad de Arica / 11-II-2006 / col. C. Valdés”;

b) “Trampa luz negra / 18°28'23,52" S. / 70°19'12,47" O. / 19 msnm”. Paratypes (5) with label, on yellow paper, “*Glaresis mondacai* / Paulsen / PARATYPE”.

Description, holotype female (Fig. 3). Length 4.2 mm, width 2.2 mm. Color dark reddish brown. Head with surface of clypeus with large tubercles separated by 1–3 diameters, frons with tubercles smaller and less dense. Clypeal apex emarginate, margin strongly beaded and anteriorly crenulate, lateral angles angulate. Mandible with apex strong but abraded, internal teeth indistinct, external marginal lobe near base rounded, slightly elevated. Pronotum with weak, almost indistinct, transverse depression in anterior ¼, only distinctly subfoveate behind eyes; fovea on each side at middle near lateral margin; distinct, broad median furrow extending from base to weak transverse anterior depression. Pronotal surface with sparse, setae-bearing, elongate tubercles; tubercles occasionally conjoined anteriorly, as long as setae; basal pronotal margin crenulate to subdentate, especially in lateral ¼. Elytra [left elytron with damage on disc] with striae flat, with small, round tubercles at setal bases; seta distinct, length less than width of rectangular interval punctures; interval punctures shallow and surface between almost coplanar with striae. Metasternum lacking metatibial furrow. Mesotibia with 5 spines in distal half, distinctly projecting at contiguous bases of spines 1–3 (mesotibia appearing toothed at middle); apex rounded. Posterior metatrochanteral margin crenulate with large, rectangular tooth before metafemur partially abraded; superior surface of metatrochanter unarmed. Metafemora with small tooth near trochanter, on left possibly abraded; superior surface unarmed; externally with tuberculate carina from strong median projection extending onto ventral surface uninterrupted (Fig. 6). Metatibia triangular, external margin with distinct triangular projection at middle (Fig. 9).

Variation. Paratypes: Length 4.0–4.6 mm, width 1.9–2.6 mm. Color light or dark reddish brown. Head with surface of clypeus strongly abraded, obscuring tubercles and crenulation. Metatrochanteral tooth generally more distinct and rectangular. Abdomens missing on remaining Peruvian specimens, obscuring sex.

Distribution (Fig. 10; $n = 6$). CHILE (2): *Arica*: Arica; Valle de Lluta. PERU (4): *Tacna*: Las Yaras.

Temporal distribution. November (4), February (1), March (1).

Etymology. The species is named in honor of my friend, Chilean field collecting comrade, and colleague, José Mondaca, Servicio Agrícola y Ganadero, Santiago, Chile, who was the first to publish on *Glaresis* from Chile. He has contributed greatly to the taxonomy of the Scarabaeoidea of southern South America and also to my research on Lucanidae and other Scarabaeoidea.

Remarks. This species is much larger than the two Argentinian species of this species group, a character that by itself is often useful in distinguishing North American *Glaresis* species. Combined with the widely disjunct distribution and morphological differences, it is clear that the species is distinct. Morphologically the most important characters are the much stronger external tooth on the metatibia (Fig. 6) and its carina that continues onto the ventral surface. The elytral tubercles are not as elongate as in *G. fritzi*.

***Glaresis smithi* Paulsen, new species**

Figs. 2, 5, 8.

Type locality. ARGENTINA: La Rioja: Guandacol.

Type series. Holotype male, deposited at CMNC, labeled: a) “ARGENTINA, La Rioja / Guandacol, 1000m. / 1-3.XII.1983, L. Peña / at light”; b) “H. & A. Howden / Collection / Ottawa, Canada”; c) on red paper, “*Glaresis smithi* / ♂ Paulsen / HOLOTYPE”. Allotype female, deposited at CMNC, labeled: a) “ARGENTINA, La Rioja / Guandacol, 1000m. / 1-3.XII.1983, L. Peña / at light”; b) “H. & A. Howden / Collection / Ottawa, Canada”; c) on red paper, “*Glaresis smithi* / ♀ Paulsen / ALLOTYPE”. Three paratypes, (CMNC) labeled: a) as holotype; b) “[*Glaresis* / *fritzi* / Mart.] / Det.: H.F. Howden, 19[86]”. Thirty-nine paratypes, (CMNC, FSCA, LEMQ, MJPC) labeled: a) as holotype. Two paratypes, (CMNC) labeled: a) as holotype; b) “H. & A. Howden / Collection / Ottawa, Canada”. One paratype, (LEMQ) labeled: a) “ARGENTINA, Mendoza / 40km. N. San Rafael / 100m., 6.XII.1983 / L. Peña”. One paratype, (CMNC) labeled: a) “ARGENTINA, Mendoza / 40km. N. San Rafael / 100m., 6.XII.1983 / L. Peña”; b) “H. & A. Howden / Collection / Ottawa, Canada”. Two paratypes (CMNC) labeled: a) “ARGENTINA: Mendoza / 1 km N Reserva Telteca / S32°18'40" W67°54'08" / Jan-4-2003, 540 m / F.C. Ocampo, A.B.T. Smith”. One paratype (UNSM) labeled: a) “ARGENTINA: Mendoza / Reserva Ecologica de Nacuñan / S34°02'42" W67°54'34" / Jan-17-2003, 824m / F.C. Ocampo, A.B.T. Smith”; b) “UNSM Scarab DNA /

Voucher specimen / [AS151 / MAY 2003]". Six paratypes, (CMNC) labeled: a) "Sa. Vaca Muerta / (950 m.s.n.m.) / Neuquen – Arg."; b) "14-XII-74 / Lg. M. Gentili"; c) "H. & A. Howden / Collection / Ottawa, Canada". Paratypes (55) with label, on yellow paper, "*Glaresis smithi* / Paulsen / PARATYPE".

Description, holotype male. Length 3.7 mm, width 1.7 mm. Color dark yellowish brown. Head with surface of clypeus and frons with moderate tubercles; tubercles separated by 2–3 diameters. Clypeal apex almost truncate, margin anteriorly not crenulate and narrowly beaded, lateral angles angulate. Mandible with apex and internal teeth strong but abraded, external lobe near base rounded. Pronotum transversely depressed in anterior ¼ and foveate at lateral ¼ of depression; fovea on each side at middle near lateral margin; distinct central furrow extended from base to transverse anterior depression. Pronotal surface with sparse, setae-bearing, weakly elongate tubercles; tubercles short as setae; basal pronotal margin crenulate, especially at posterior angle. Elytra with striae weakly concave, with small, round tubercles at setal bases; seta indistinct, shorter than rectangular interval punctures; interval with punctures shallow and surface between almost coplanar with striae. Metasternum lacking metatibial furrow. Mesotibia with 4 spines in distal half, equally projecting at bases (mesotibia not appearing toothed at middle); apex rounded. Posterior metatrochanteral margin tridentate with largest, obtuse tooth before metafemur; superior surface of metatrochanter unarmed. Metafemora with small tooth near trochanter; superior surface unarmed; externally with tuberculate carina from median projection extending onto ventral surface but interrupted, appearing as two distinct tubercles (Fig. 5). Metatibia triangular, external margin not distinctly projecting at middle (Fig. 8). Male genitalia not differing significantly from that of *G. fritzi* (see Gordon & Hanley 2014, fig. 15E).

Variation. Allotype female: Length 4.0 mm, width 1.7 mm. Paratypes: Length 3.1–4.0 mm, width 1.5–1.9 mm. Color light to dark reddish brown.

Distribution (Fig. 10; *n* = 57). ARGENTINA (51): *La Rioja* (44): Guandacol. *Mendoza* (5): 40 km N San Rafael; Reserva Telteca; Reserva Nacuñan. *Neuquén* (6): Sierra de la Vaca Muerte.

Temporal Distribution. January (3), December (54).

Etymology. The species is named in honor of my friend, former lab-mate, and colleague, Andrew B.T. Smith, Canadian Museum of Nature, Ottawa, Canada, who collected part of the type series, for his research and valued collaboration on taxonomy of the Scarabaeoidea of southern South America.

Remarks. Overall this species seems to be found at higher elevations than *G. fritzi*, although the two species have been collected together at 500–1100 m in Mendoza Province in and around Reserva Nacuñan. The short, fine, almost indistinct elytral setae and ventral surface of the metatibia with two tubercles at middle (Fig. 5) will readily identify this species.

Key to South American species of *Glaresis*

1. Robust, usually much larger species (~4–6 mm). Pronotum strongly convex; median longitudinal furrow and foveae indistinct; surface with large, round tubercles *G. pardoalcaidei* Martínez *et al.*
- 1'. Elongate, smaller species (~4 mm or less). Pronotum not strongly convex and with distinct median longitudinal furrow and foveae; surface with small, indistinct tubercles at setal bases or distinctly elongate tubercles 2
2. Elytral setae fine, short, almost indistinct. Metafemora ventrally with interrupted carina appearing as two tubercles (Fig. 5). *Glaresis smithi* Paulsen
- 2'. Elytral setae coarse, long, and distinct. Metafemora not as above 3
3. Larger species (~4 mm), external tooth of metatibia strong, carina extending onto ventral surface (Fig. 6). Atacama region of Chile, Peru. *Glaresis mondacai* Paulsen
- 3'. Smaller species (~3.5 mm), external tooth of metatibia moderate, carina not extending onto ventral surface (Fig. X). Argentina *Glaresis fritzi*



FIGURE 10. Distribution of South American species of the *Glaresis inducta* group: orange circles = *G. fritzi*, white squares = *G. smithi*, blue triangles = *G. mondacai*.

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