

A new species of *Golofa* Hope, 1837 from Peruvian Andes (Coleoptera: Scarabaeidae: Dynastinae)

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Abstract. A new species of dynastine scarab, *Golofa paulinae* sp. nov. is described and illustrated on the basis of one male specimen collected in Callejon de Huaylas (Ancash, Peru). Detailed comparisons with morphologically similar South American species are performed.

INTRODUCTION

The genus *Golofa* Hope, 1837 includes around 36 species distributed from Mexico to Argentina, according to different bibliographic sources (Endrödi 1977, Lachaume 1985, Milani 2021). In South America, 23 species have been recorded, of which 11 were described during the last 40 years from Argentina (Abadie 2007), Colombia (Pardo-Locarno & Villalobos-Moreno 2020), Ecuador (Voirin 1984, Lachaume 1985, Ratcliffe et al. 2020), Paraguay (Voirin 1994), Peru (Dechambre 1989, Voirin 1994, Ratcliffe & Le Tirant 2017, Milani 2021) and Venezuela (Arnaud and Joly 2006).

In most species of genus *Golofa*, male specimens have distinctive horns or foveae on pronotum. However, males of South American species *Golofa inermis* Thomson, 1859, *Golofa unicolor* (Bates, 1891), *Golofa minuta* Sternberg, 1910 and *Golofa testudinaria* (Prell, 1934) lack pronotal horns and because of this singularity they have been grouped in subgenus *Praogolofa* Bates, 1891, as it appears in different taxonomic keys (Gutierrez 1950), nomenclatural notes (Dechambre 1975) and reviews (Endrödi 1977, Lachaume 1985). The subgeneric status of *Praogolofa* has not been supported with additional morphological evidence and in absence of a comprehensive revision at genus level, has been treated as synonym in recent country reviews of dynastine fauna (Ratcliffe et al. 2020).

According to tribal level reviews (Endrödi 1977, Lachaume 1985) and later descriptions (Voirin 1994) and checklists (Ratcliffe et al. 2015, Milani 2021), ten species have been recorded from Peru so far, namely: *Golofa aegeon* (Drury, 1773), *Golofa bifidus* Voirin, 1994, *Golofa bubeniki* Milani, 2021, *Golofa clavigera* (Linnaeus, 1771), *Golofa eacus* Burmeister, 1847, *Golofa limogesii* Ratcliffe & Le Tirant, 2017, *Golofa minuta* Sternberg, 1910, *Golofa spatha* Dechambre, 1989, *Golofa testudinaria* (Prell, 1934) and *Golofa unicolor* (Bates, 1891).

While the author was examining *Golofa* specimens housed in Peruvian collections, a peculiar specimen from Callejon de Huaylas (Ancash, Peru) was found. Direct comparisons and consultation of bibliographic resources revealed that it was an undescribed species. The objective of the present work is to provide a description of the new species and differential diagnosis with other South American species lacking pronotal horns.

MATERIAL AND METHODS

The following abbreviations of institutional collections are used in the text:
MEKRB Museo de Entomología Klaus Raven Büller, Universidad Nacional Agraria La Molina, Lima, Peru;
SENASA Laboratorio de Sanidad Vegetal, Servicio Nacional de Sanidad Agraria, Lima, Peru.

Morphological terms of description and differential diagnosis follow most recent works dealing with *Golofa* species (Ratcliffe et al. 2020, Milani 2021). Comparisons with similar South American *Golofa* species were based on examination of *G. inermis* (♂), *G. minuta* (♂) and *G. testudinaria* (♀♀) specimens (MEKRB, SENASA), original descriptions (Thomson 1859, Bates 1891, Sternberg 1910, Prell 1934) and available key to species and redescriptions (Gutierrez 1950, Endrödi 1977, Lachaume 1985, Ratcliffe et al. 2020).

The specimen of the newly described species is provided with red printed label for HOLOTYPE. Holotype is provided with sex symbol and words A. Giraldo det. 2020. Label data are cited for the material examined, individual lines are indicated by a single slash (/).

TAXONOMY

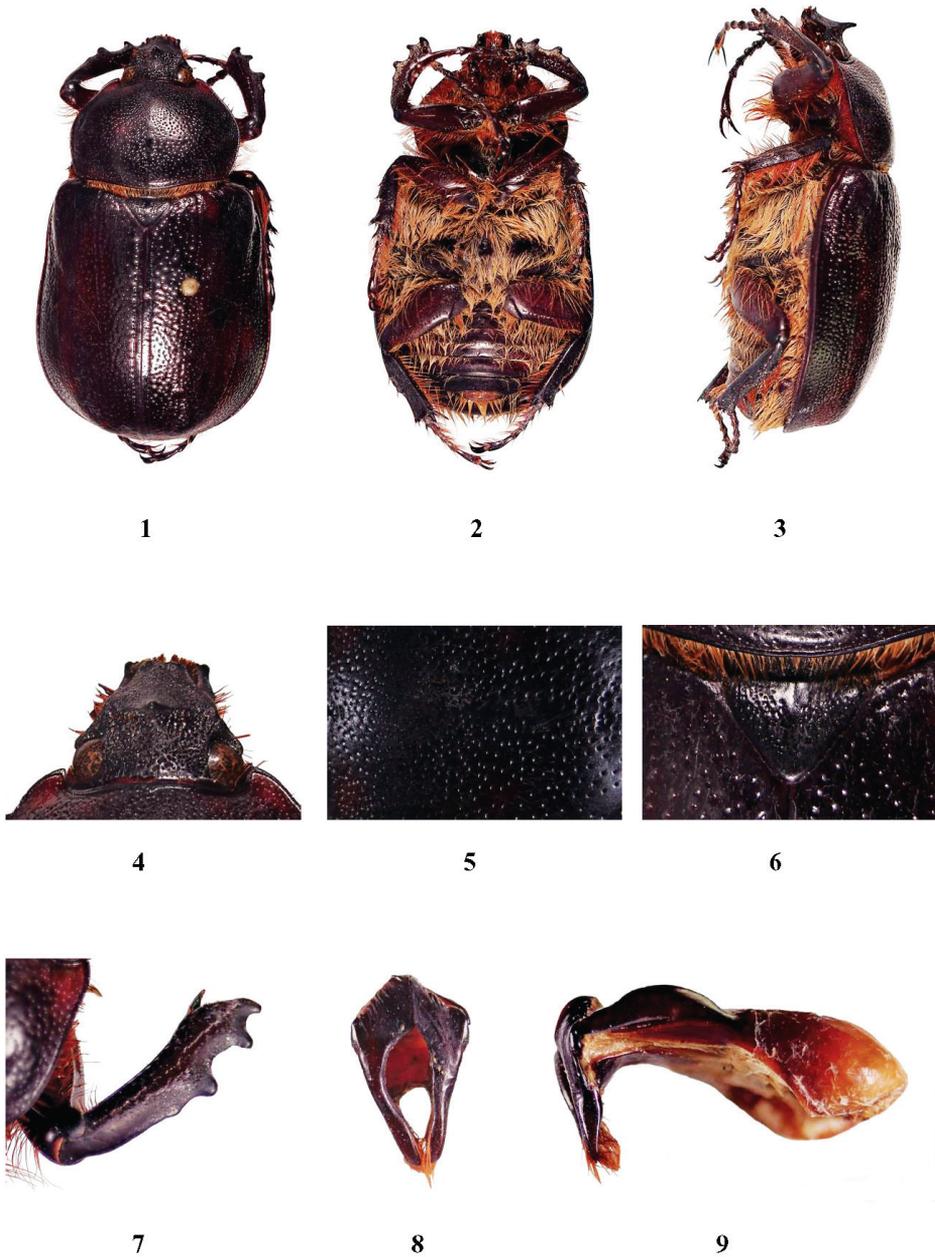
Golofa paulinae sp. nov. (Figs. 1-9)

Type locality. Callejon de Huaylas, Caraz (09°02'54"S, 77°48'39"W).

Type material. Holotype (♂) labelled: PERU, Ancash/Huaylas, Caraz/22.II.1992, R. Beingolea leg., (MEKRB).

Description of holotype. Body robust, oval and convex. Color with head, pronotum, scutellum, tibiae and tarsi slaty black, pronotum and femora with castaneous reflections; elytra and pygidium castaneous (Fig. 1). Body size, length from clypeus to elytral apex = 39.10 mm, maximum abdominal width = 23.10 mm, ratio length/width = 1.69.

Head. Clypeus subtrapezoidal, narrowly emarginated, apex bilobed and reflexed; surface with fine and sparse punctures, sparser towards clypeal apex (Fig. 4). Mandibles long, slightly concave, directed outwards, with apex distinctly bidentate. Frontoclypeal region with short horn, almost straight, apically blunt (Fig. 3). Frons surface with coarse and dense punctures, roughened on interocular area; with scarce, erect, minute, tawny setae, that are more noticeable near to horn (Fig. 4). Interocular width equals 3.0 transverse eye diameters. Antenna with 10 antennomeres, club subequal in length to antennomeres 2-7; scape with numerous spiny, long, tawny setae inserted on distal half.



Figs. 1-9. *Golofa paulinae* sp. nov.: 1- habitus, dorsal view; 2- habitus, ventral view; 3- habitus, lateral view; 4- head, dorsal view; 5- pronotum, punctures on disk; 6- scutellum, punctures on surface; 7- protibia, teeth on margin; 8- parameres, caudal view; 9- parameres, lateral view.

Pronotum. Simply convex, without horn; subhexagonal in dorsal view, upper profile convex in lateral view (Figs. 1, 3). All sides with complete marginal bead; with lateral and basal external margins slightly excavated and thin. Surface with coarse and dense punctures (Fig. 5); punctures denser on disc and along lateral margins, sparser towards anterior and posterior angles. Below the anterior margin with a row of fine tawny setae directed towards the head; below the basal margin with a row of stout setae directed towards the elytra.

Scutellum. Subtriangular, with coarse punctuation mostly restricted to basal half; without noticeable hairs (Fig. 6).

Elytra. Humeral callus protruding and apical callus present, but smaller than humeral (Fig. 3). Surface mostly finely shagreened, with coarse, dense and even wrinkled punctures; shiny either side of suture, with sparse minute punctures; dull on humeral surface, with sparse minute punctures. Sutural stria is a row of punctures near to base and turns into strongly impressed line in most of its length.

Propygidium. Slightly convex; surface with stridulatory areas formed by fine granules arranged in transverse rows.

Pygidium. Surface on apical two thirds glabrous, shiny and with dense minute punctures; on basal third covered with dense vestiture of yellowish, stout setae, densely punctate. In lateral view, basal third strongly convex, apical two thirds nearly flat and almost retracted beneath basal third.

Ventrum. Prosternal process moderately long, laminate and with apex subtruncate. Surface covered with dense and long setae, denser and yellowish on prosternum, mesosternum, metasternum and lateral areas of abdominal sternites, sparser and tawny on hypomeron (Fig. 2).

Legs. Femora, tibiae and tarsi covered with tawny setae. Protibia quadridentate, with rounded teeth grouped in pairs, basal tooth reduced (Fig. 7). First protarsomere subequal in length to second protarsomere. Mesotibia at external border with four apical rounded teeth and two teeth on oblique carina. Mesotarsus and metatarsus with first tarsomere extended into apical spine-like tooth.

Genitalia. Asymmetric parameres, wider at basal half, left paramere is deeply concave at upper half of internal side. Each paramere bears four dorsobasal tubercles, noticeable as carinae; with long, dense, tawny setae on apices (Fig. 8). In lateral view, basal piece is noticeably convex on dorsal surface (Fig. 9).

Variability and sexual dimorphism. Only male holotype is known.

Differential diagnosis. Absence of pronotal horns in males has been used as a reliable character to distinguish species groups in genus *Golofa* (Endrödi 1977, Lachaume 1985, Ratcliffe et al. 2020). When male polymorphism has been documented based on large series of specimens, male forms differ in development of pronotal horn, not in its presence or absence (Voin 1994, Ratcliffe & Le Tirant, 2017, Ratcliffe et al. 2020). Consequently, comparisons of *G. paulinae* with other species are limited to the four South American species with males lacking pronotal horns, *G. inermis*, *G. minuta*, *G. testudinaria* and *G. unicolor*, sometimes treated under subgenus *Praogolofa*.

The most similar species in color is *G. testudinaria*, with head and pronotum black and elytra dark reddish brown, but it is clearly distinguished by its shorter length (25-26 mm), pointed and unequal-sized protibial teeth, absence of stridulatory area on propygidium and symmetric parameres, wider at apical half and without dorsobasal tubercles. The most dissimilar species in color is *G. unicolor*, with head dark brown and pronotum and elytra yellowish brown, and it is also different by its small median tubercle on frontoclypeal region, pronotum surface with fine and sparse punctures, and symmetric parameres, slightly wider in basal half and without dorsobasal tubercles.

Regarding the two species whose male specimens could be directly compared, these species also have different body color patterns, *G. inermis* is yellowish brown with head, scutellum, margins, pronotal spots and elytral suture black, and *G. minuta* has head and pronotal midline black, pronotum and scutellum castaneous and elytra yellowish brown. Apart from its different coloration, *G. inermis* is distinguished by its small tubercle in frontoclypeal region, three unequal-sized protibial teeth, and parameres with two weak dorsobasal tubercles. In the case of *G. minuta*, parameres are clearly distinctive, these are symmetric, much wider at basal half and with two weak dorsobasal tubercles. Comparison between *G. paulinae* and male specimens of these two species are summarized in Table 1.

Table 1. Morphological comparison between type specimen of *G. paulinae* and examined male specimens of *G. inermis* and *G. minuta*.

<i>species</i> characters	<i>paulinae</i>	<i>inermis</i>	<i>minuta</i>
Dorsal coloration	head and pronotum black, elytra castaneous	head, pronotal spots, scutellum and suture, black, pronotum and elytra yellowish brown	head black, pronotum castaneous, elytra yellowish brown,
Frontoclypeal region	with a short horn	with a small tubercle	with a short horn
Clypeus	subtrapezoidal, apex bilobed	subtriangular, apex bilobed	subtriangular, apex bilobed
Mandibular apex	bidentate	bidentate	bidentate
Pronotal punctuation	coarse and dense	coarse and sparse	coarse and dense
Parameres	asymmetric, wider in basal half, with four dorsobasal tubercles	asymmetric, wider in basal half, with two dorsobasal tubercles	symmetric, wider in basal half, with two dorsobasal tubercles

Etymology. The specific name is a tribute to the author's grandmother Paulina Vega Cano (1920-2021), who was born in a town located at Callejon de Huaylas.

Distribution. Only known from type locality. Label data does not mention anything about habitat preferences for this species. Presumably, the species should be found in inter-Andean scrubs growing naturally in this geographic area (2000-3000 m).

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