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TAXONOMY AND SYSTEMATICS

# A new species of *Haplophileurus* (Coleoptera: Scarabaeidae: Dynastinae: Phileurini) from Colombia, with a key to the species of the genus

## Una nueva especie de *Haplophileurus* (Coleoptera: Scarabaeidae: Dynastinae: Phileurini) para Colombia, con una clave para las especies del género

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## ABSTRACT

A new species, *Haplophileurus germanamati,* from the western slope of the Sierra Nevada de Santa Marta in Colombia, is described and illustrated. The new species is diagnosed by the presence of six to nine small punctures at the base of the first broad elytral interval, the glabrous pygidium, and the elongated paramers. A taxonomic key to the species of *Haplophileurus* is provided in both English and Spanish.

**Keywords:** Taxonomy, morphology, scarab beetles, Scarabaeoidea

## RESUMEN

Se describe y se ilustra una nueva especie, *Haplophileurus germanamati,* de la vertiente occidental de la Sierra Nevada de Santa Marta en Colombia. La nueva especie tiene como caracteres diagnósticos la presencia de seis a nueve pequeñas puntuaciones en la base del primer intervalo elitral, pigidio glabro y la forma alargada de los parámeros. Se proporciona una clave taxonómica para las especies de *Haplophileurus*, en inglés y español.

**Palabras clave:** Taxonomía, morfología, escarabajos, Scarabaeoidea

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## INTRODUCTION

The genus *Haplophileurus* was erected by Kolbe (1910) to accommodate the transfer of a single species *Phileurus uninodis* Burmeister, 1847, which was distinguished from other *Phileurus* species by having truncated posterior tibiae, without clearly distinguishable strong teeth. Currently the genus contains three species, all with Andean distribution in Northern South America (Ratcliffe *et al.* 2020). *Haplophileurus uninodis* (Burmeister, 1847) is known from Ecuador and Colombia, whereas *H. dechambrei* Dupuis, 2011 and *H. caudipenis* Dupuis, 2011 are only known from Colombia and Ecuador, respectively. *Haplophileurus* species can be recognized by the apex of the metatibia truncate and with numerous small spinules (as opposed to large teeth), a distinctive fringe of reddish-brown setae arising from beneath the lateral margins of the pronotum, and the single tubercle on the head (Ratcliffe *et al.* 2020). The female is only known for *H. caudipenis*, and the life history and immature stages are unknown for all species (Ratcliffe *et al.* 2020).

In Scarabaeoidea, the shape of the parameres has been a diagnostic feature of taxonomic and systematic value for species identification (D'Hotman and Scholtz 1990a, 1990b), and to propose interspecific relationships of the superfamily (Martín-Piera 1992). Although the description of a new species based on a unique specimen, is not recommended in some taxonomic groups, some currently valid Neotropical species of Phileurini, such as *Allophileurinus cavifrons* Dupuis and Dechambre (Dupuis and Dechambre 2001), *Archophileurus temnorrhynchodes* Lamant-Voirin (Lamant-Voirin 1995), *Haplophileurus caudipenis* Dupuis, *Haplophileurus dechambrei* Dupuis (Dupuis 2011), *Palaeophileurus carbo* Ratcliffe, and *Palaeophileurus erebus* Ratcliffe (Ratcliffe 2002), have been described from single specimens; similar to other Neotropical Rutelinae (e.g., Smith 2003) and Dynastinae (e.g., López- García and Deloya 2019). We herein describe a new species of *Haplophileurus* from Magdalena Department in Colombia, based on a single male.

## MATERIAL AND METHODS

Photographs and measurements were taken with an optical stereomicroscope Leica M125 with an integrated Leica MC 120 HD digital camera and processed with the software Leica Application Suite 3.4.0 and using Combine ZP version 1.0., for image stacking. Label data is quoted verbatim. A single slash (/) indicates a break between lines on the same label, and a double slash (//) indicates a different label. The phylogenetic species definition of Wheeler and Platnick (2000) is used, which considers the species as the smallest aggregation of populations diagnosable by a unique combination of character states. The distribution map was created using ArcGIS 9.3 (ESRI Inc. 1999–2014). The specimen was compared against original descriptions of the closely related species (Dupuis 2011). The holotype is deposited in the entomological collection of the Universidad del Atlántico, UARC, Barranquilla, Colombia. Since females of the species have not been formally described, the taxonomic key provided is to be used with males only.

## RESULTS

***Haplophileurus germanamati*** Mendoza-Pérez, Gasca-Álvarez and García-Atencia new species

(Figs. 1-3)

**Type Material.** Holotype male, "COLOMBIA, Magdalena / San Pedro, Hierbabuena / 10.895134°N, 73.999611°W / 2104 msnm, 28-marzo-2017 / Trampa de luz, BHM / Col. I. Mendoza-Pérez // Dynastinae, Phileurini / *Haplophileurus* sp / Det. I. Mendoza-Pérez // UARC: ENT(C) / 00086 // HOLOTYPE ♂ / *Haplophileurus germanamati* / Mendoza-Pérez, Gasca- / Álvarez & García-Atencia 2023 (red label)". Deposited at Universidad del Atlántico, UARC, Barranquilla, Colombia.

**Diagnosis.** *Haplophileurus germanamati* can be easily distinguished from other species of the genus by the presence of six ti nine small punctures at the base of the first broad elytral interval, whereas in *H. caudipenis* and *H. dechambrei* there are two to five punctures and are absent in *H. uninodis*. The pygidium surface in *H. germanamati* is glabrous, whereas in all the other species of *Haplophileurus* it is setigerous. The shape of the parameres in *H. germanamati* is unique for the species in the genus, in which they are elongated and narrow in the middle, curved apically, and with a conspicuous tooth laterally (Fig. 2). Other differential characters between species are summarized in Table 1.

**Description. Holotype**. Male (Fig. 1a, b, c). Length 24.5 mm; width 12.3 mm. Color black. **Head:** Entire surface transversely rugose. Frons and vertex are deeply conca-

**Table 1.** Differential characters between *H. caudipenis*, *H. uninodis*, *H. dechambrei*, *H. germanamati* sp. nov.

| | *H. caudipenis* | *H. uninodis* | *H. dechambrei* | *H. germanamati* |
|---|---|---|---|---|
| Head surface | Transversely rugose | Transversely rugose | Circularly rugose | Transversely rugose |
| Anterior tubercle | Long, acute | Short, rounded | Short, rounded | Short, rounded |
| Clypeal apex | Acute | Acute | Acute | Slightly acute |
| First broad interval of elytra furrows | 3–5 punctures | Lacking punctures | 2 punctures | 6–9 punctures |
| Pygidium | Setigerous | Setigerous | Setigerous | Glabrous |
| Parameres | Short, broad at apex | Elongated, broad at apex | Elongated, narrow at apex | Elongated, narrow at apex |

ve. Broad, blunt tubercle on anterior margin of concavity, apical surface opaque. Clypeus triangular, steeply declivous, apex acute to rounded, recurved. Antenna with ten antennomeres, club subequal in length to antennomeres two to seven. **Pronotum:** Apical half with broadly transverse, shallow depression as wide as the distance between inner margin of eyes, surface rugose. Median, longitudinal furrow broad, deep, extending from near base to middle of pronotum, with large, rugose punctures. The surface of on anterior half is transversely rugose; the surface on the posterior half with dense punctures moderate in size. **Scutellum:** Semicircular; with deep horseshoe-shaped punctures. **Elytra:** Surface with uniserially punctate striae in furrows; punctures ocellate, moderate to large, most confluent end to end. First broad interval with six to nine small punctures. **Pygidium:** Basal half smooth with minute punctures moderate in density, glabrous; apical half with small, sparse punctures; apical border with long, tawny setae. Surface evenly convex in lateral view. **Legs:** Protibia quadridentate, basal tooth shorter. The apex of mesotibia truncate with nine small, thick spinules. The apex of the metatibia truncates with twelve small, thick spinules. **Venter:** Prosternal process long, broad, columnar, with long, reddish brown setae, apex rounded to truncate. **Parameres:** Elongated, narrow at the middle, curved at apex; base broad, apex rounded. Sides with a conspicuous tooth (Fig 1d, e). Median lobe membranous, elongated.

**Etymology.** This species is named after our mentor, friend, and colleague Germán Amat García, to honor his memory. German was a great Colombian coleopterologist and expert on Passalidae, with many contributions to the knowledge of the Colombian fauna of Coleoptera. His teachings and charisma will always remain engraved in our memory.

**Distribution.** *Haplophileurus germanamati* is only known from the Vereda Hierbabuena, corregimiento of San Pedro de la Sierra, located on the western slope of the Sierra Nevada de Santa Marta (Fig. 4). It belongs to the jurisdiction of the Ciénaga municipality, in the Magdalena department, Colombia.

**Natural History.** Little is known about the life history of this species. Holotype label data indicate it was collected with light traps over 2000 m elevation. The area of the type locality where the species was collected corresponds to a fragment of humid montane forest (Fig. 4). The forest is located at an approximate elevation of 2100 m, with average annual precipitation and temperature of 2200 mm, and 9°C, respectively (De Moya-Guerra 2019). The vegetation is characterized by being very dense and humid with a predominance of epiphytic ferns associated with the canopy of the trees, mosses, lichens, palms, and bamboo. Deforestation for the implementation of pastures and the planting of invasive species (*Pinus* sp.) has caused the fragmentation of the forest (De Moya-Guerra 2019).

**Key to the species of male *Haplophileurus***

First broad interval of elytra striae furrows with two to nine small punctures ..... 2

-. First broad interval of elytra striae furrows without punctures ***H. uninodis* (Burmeister)**

Male frons with short, rounded, broad tubercle. Truncate apex of metatibia with twelve or fourteen small, thick spinules. Apex of parameres narrow ..... .....3

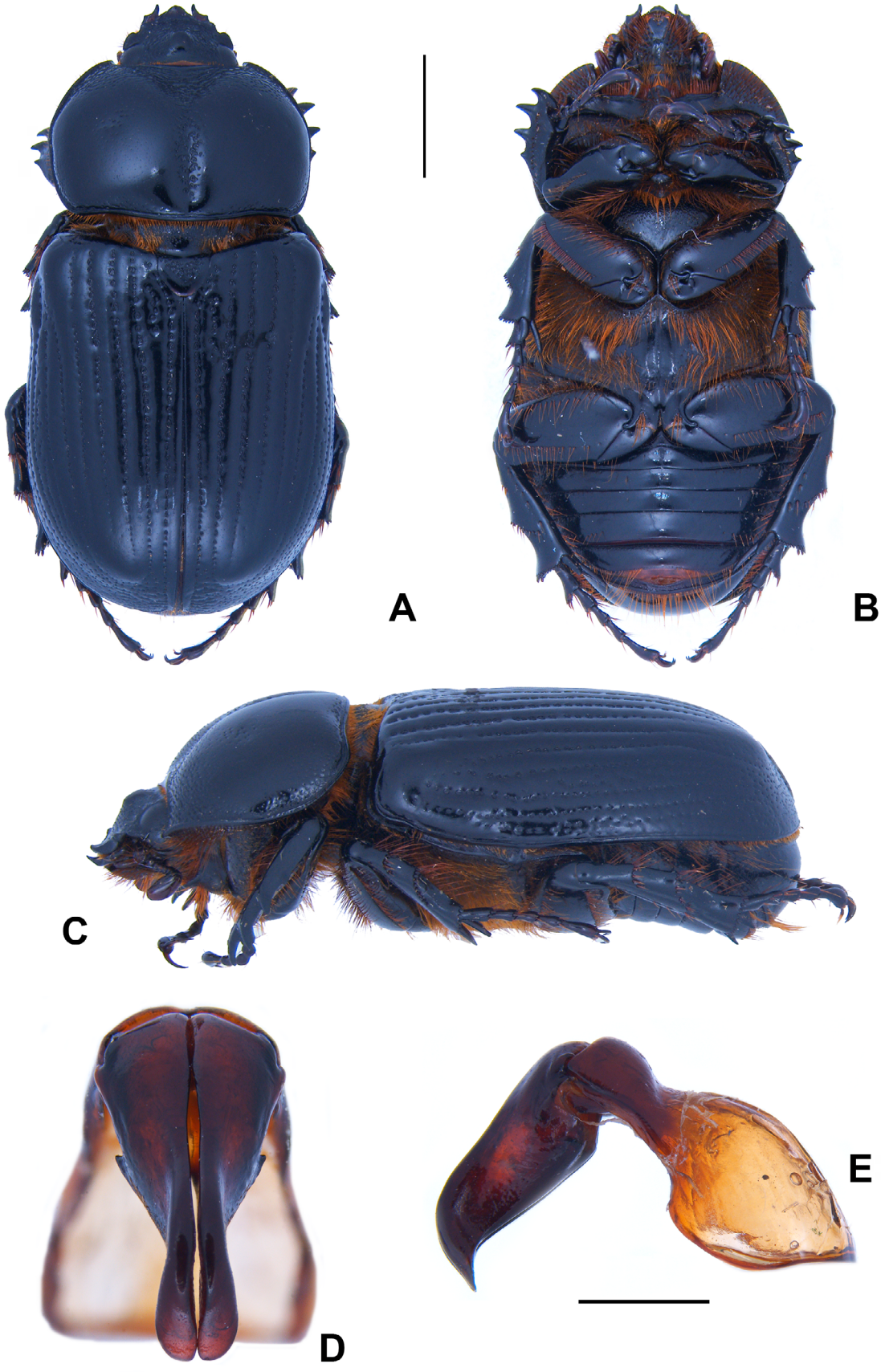


**Fig 1.** *Haplophileurus germanamati* new species. Habitus A) Dorsal view, B) Ventral view (scale bar = 5 mm), C) Lateral view; Parameres D) frontal view, E) lateral view (scale bar = 2 mm)

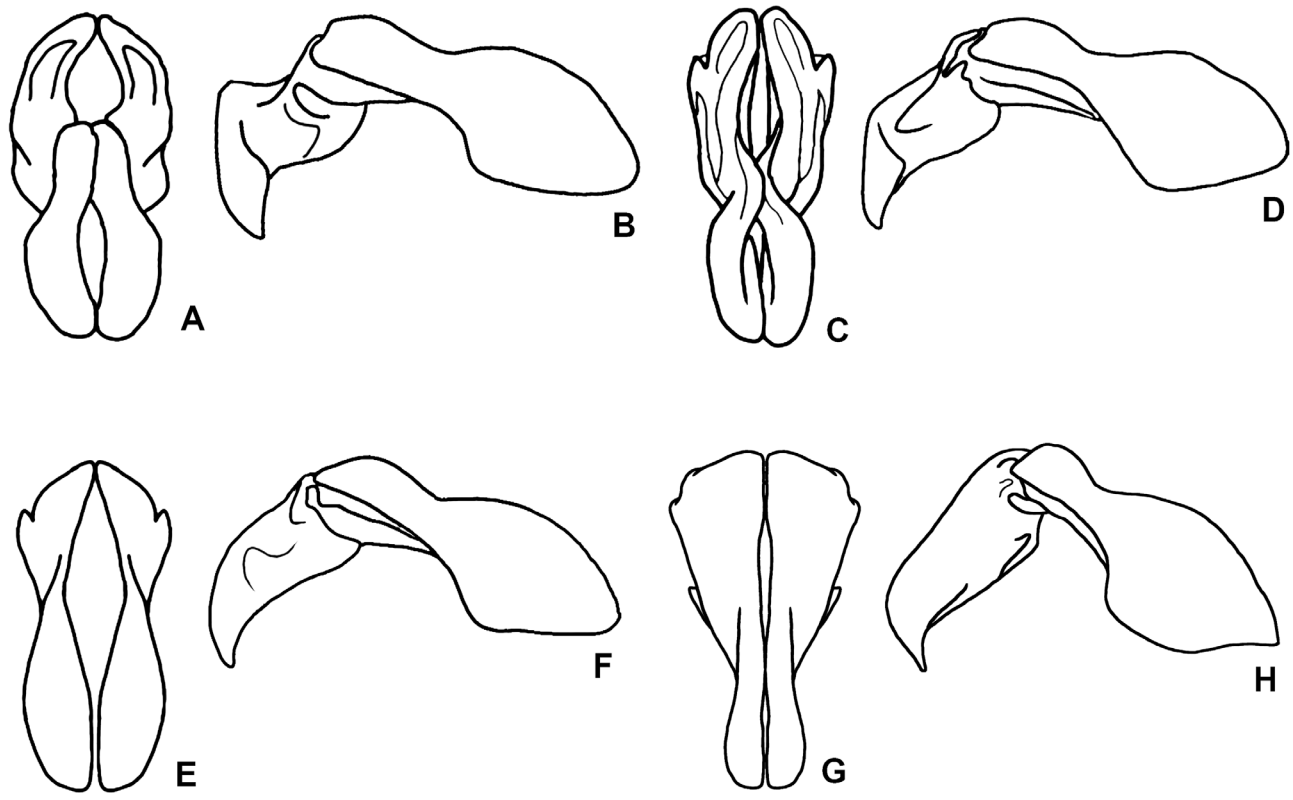


**Fig 2.** Parameres (frontal and lateral views) of (A, B) *H. caudipenis* Dupuis (redrawn from Dupuis 2011); (C, D) *H. dechambrei* Dupuis (redrawn from Dupuis 2011); (E, F) *H. uninodis* Burmeister (redrawn from Dupuis 2011); (G, H) *H. germanamati* sp. nov.

-. Male frons with long, acute, broad tubercles. Truncate the apex of metatibia with nine to twelve small, thick spinules. Apex of parameres broad (Fig. 2a, b) ***H. caudipenis* Dupuis**

Head surface circularly rugose in frons. Clypeal apex is strongly acute and recurved. The first broad interval of elytra striae furrows with two small punctures. Basal half of pygidium setigerous, setae long. Parameres elongated, parallel in the apical half and slightly overlapping at the center (Fig. 2c, d) ..... ***H. dechambrei* Dupuis**

-. Head surface transversely rugose in frons. Clypeal apex slightly acute and recurved. First broad interval of elytra striae furrows with six to nine small punctures. Basal half of pygidium glabrous. Parameres elongated, parallel and straight in the apical half, not overlapping at center (Fig. 2g, h)..... ***H. germanamati* sp. nov.**

**Clave para las especies de machos de *Haplophileurus***

Primer intervalo de surcos de estrías en los élitros con dos a nueve puntos pequeños.....2

-. Primer intervalo de surcos de estrías en los élitros sin puntos ..... ***H. uninodis* (Burmeister)**

Frente de los machos con un tubérculo corto, redondeado y ancho. Ápice truncado de la metatibia con doce o catorce espínulas pequeñas y gruesas. Ápice de los parámeros estrecho.....3

-. Frente de los machos con un tubérculo largo, agudo y ancho. Ápice truncado de la metatibia con nueve a doce espinulas pequeñas y gruesas. Ápice de los parámeros ensanchado (Fig. 2a, b)... ***H. caudipenis* Dupuis**

Superficie de la cabeza circularmente rugosa en la frente. Ápice del clípeo fuertemente acuminado y recurvado. Primer intervalo de surcos de estrías en los élitros con dos puntos pequeños. Mitad basal del pigidio setígera, sedas largas. Parámeros elongados, paralelos hacia la mitad api-

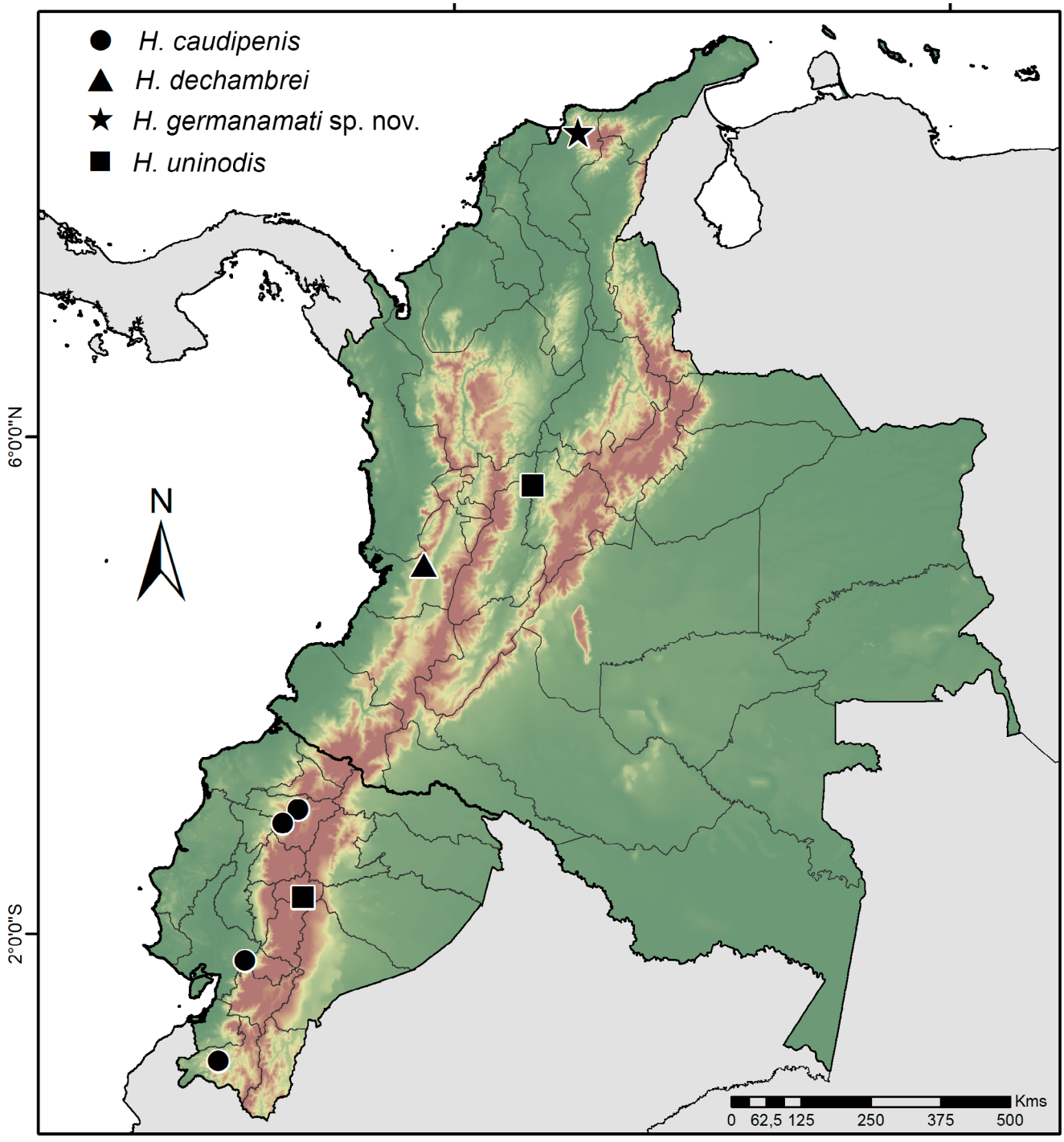


**Fig. 3.** Known geographic distribution for *Haplophileurus* species (Scarabaeidae) in Colombia and Ecuador, South America.

cal y ligeramente superpuestos al centro (Fig. 2c, d) ***H. dechambrei* Dupuis**

-. Superficie de la cabeza transversalmente rugosa en la frente. Ápice del clípeo ligeramente acuminado y recurvado. Primer intervalo de surcos de estrías en los élitros con sea a nueve puntos pequeños. Mitad basal del pigidio glabra, sin sedas. Parámeros elongados, paralelos y rectos hacia la mitad apical, no superpuestos al centro (Fig. 2g, h) ..... ***H. germanamati* sp. nov.**

**Fig. 4.** Humid montane forest habitat at the type locality of *Haplophileurus germanamati*, vereda Hierbabuena, San Pedro de la Sierra, Ciénaga, Magdalena, Colombia. Photographs by Ivan Mendoza-Pérez.

## REMARKS

*Haplophileurus germanamati* is the fourth species discovered in the genus. Species of *Haplophileurus* are restricted to the Andean region of northern South America (Fig. 3). Most of the species' records cover an altitudinal range between 1000 and 2900 m elevation. Only two isolated records for *H. caudipenis* and *H. uninodis* are below 400 m elevation.

## ZOOBANK REGISTRATION

urn:lsid:zoobank.org:pub:86D1AE0D-B3B8-42ED-BBBB-120E3B928FE3

## AUTHOR´S CONTRIBUTIONS

IM collected the field data, provided photos, and identified the specimen. HJGA identified and described the specimen, wrote the manuscript, and conducted the final corrections. IM and SGA added information and revised the manuscript.

## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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