

A new species of small myrmicine ant in the genus *Eurhopalothrix* Brown & Kempf, 1961 (Hymenoptera: Formicidae) from Colombia

Una nueva especie de hormiga myrmicina pequeña del género *Eurhopalothrix* Brown & Kempf, 1961 (Hymenoptera: Formicidae) de Colombia

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Abstract: A new species of *Eurhopalothrix* Brown & Kempf, *E. amati* Fiorentino, Tocora and Fernández, **n. sp.** is described based on workers collected in northwestern Colombia. A taxonomic key and distributional map for the new species in the country are provided. This new species differs from other *Eurhopalothrix* ants by the configuration of specialized setation, a decrease in its propodeal spines, its irregular metanotum profile, and the triangular shape of the head capsule.

Keywords: Attini, biodiversity, Colombia, *Eurhopalothrix*, Neotropics, taxonomy.

Resumen: Una nueva especie de *Eurhopalothrix* Brown & Kempf, *E. amati* Fiorentino, Tocora and Fernández, **n. sp.** se describe con base en obreras colectadas en el noroccidente de Colombia. Se proporciona una clave taxonómica y un mapa de distribución para las especies en el país. La nueva especie se diferencia de las demás hormigas *Eurhopalothrix* por la configuración de pilosidad especializada, disminución de sus espinas propodeales, perfil irregular del metanoto y la forma triangular de la cápsula cefálica.

Palabras clave: Attini, biodiversidad, Colombia, *Eurhopalothrix*, Neotrópico, taxonomía.

Introduction

Eurhopalothrix Brown & Kempf, 1961 is a myrmicine ant genus with 53 species known from the Neotropics and the Indo-Australian region (Mezger and Pfeiffer 2010; Longino 2013a). They are recognized by their deep antennal socket, seven-segmented antennae, and triangular mandibles (Longino 2013a). These ants inhabit soil and litter, and prey on other insects (Longino 2013a). In the phylogenetic analysis by Ward *et al.* (2015), *Eurhopalothrix* appears paraphyletic with respect to *Talaridris* Weber, 1941. For the Neotropical region, Ketterl *et al.* (2004) and Longino (2013a) described and presented keys for the species of the genus. Longino (2013a) recognized 28 species for the Neotropics, describing 14 new species for the Mesoamerican subregion. This author also predicted the possibility of discovering numerous new species for South America with the expanded implementation of Winkler traps in many parts of the territory (Longino 2013a). Recent field trips throughout the Colombian territory have validated these predictions (Guerrero *et al.* 2018; García *et al.* 2020, as the country currently ranks as the second most diverse Neotropical country with 105 genera and more than 1100 ant species. In this paper, a new *Eurhopalothrix* from Colombia is described, being the smallest known species of the genus to date. *Eurhopalothrix amati* **n. sp.** is described in honor of the friend and colleague Germán Amat (National University of Colombia).

Materials and methods

The examined specimens came from the entomological collection of Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH), Villa de Leyva, Colombia. The samples were mounted and imaged with a Nikon SMZ25 stereomicroscope and DS-Ri2 camera with NIS Elements software at the New Jersey Institute of Technology (NIJT).

The terminology for external morphology follows Bolton (1994) for most body structures, as well as Harris (1979) for sculpture. Terms more specific to *Eurhopalothrix* follow Longino (2013a, 2013b). All measurements are given in millimeters (mm).

HW: head width; in full-face view, maximum width of head capsule.

HL: head length; in full-face view, maximum length of head, from line tangent to anteriormost projection of clypeus to line tangent to posteriormost projection of vertex margin.

SL: scape length; in dorsal view, maximum length of scape from apex to furthest extension of basal lobe.

SLL: scape lobe length; measured along the same line as scape length, distance from furthest extension of basal lobe to point perpendicular to anterior sinus formed by the neck and basal condyle of scape.

ML: mesosoma length; in lateral view, distance from base of anterior face of pronotum to posteriormost extension of metapleural or propodeal lobe (whichever extends further).

CI: cephalic index; $100 \cdot HW/HL$.

SLI: scape lobe index; $100 \cdot SLL/SL$

Results and discussion

Key to workers of the species of *Eurhopalothrix* for Colombia (adapted from Longino, 2013a)

1. In profile, posterior face of propodeum with broad, rectangular lamella, not differentiated into acute propodeal spines (Fig. 1A); $HW < 0.6$ 2

- In profile, posterior face of propodeum with distinct acute propodeal spines (Fig. 1B, C); HW variable 3

2. Larger-sized species (HW 0.53–0.58); dorsal surface of the scape uniformly covered with scale-like, fully appressed setae, absence of differentiated setae projecting from the anterior margin of the scape; promesonotal profile elevated, three pairs of projecting pompon-like setae on promesonotum (Fig. 1B) *E. pilulifera* Brown & Kempf, 1960

- Smaller-sized species (HW 0.42–0.44); dorsal surface of scape with differentiated setae projecting from the anterior margin; promesonotal profile low, single pair of projecting pompon-like setae on promesonotum (Fig. 1A) *E. amati* n. sp.

3. Relatively small species (HW < 0.56 ; CI = 96); basal pilosity conspicuous, spatulate; distinct erect setae, strongly spatulate, as wide as they are long; first gastral tergum with spatulate setae in double row, 4–5 pairs from the middle down, flanked by 2 or 3 additional setae *E. alopeciosa* Brown & Kempf, 1960

- Relatively large species (HW > 0.55 ; CI > 95); other traits variable; not with the above combination of features 4

4. Masticatory margin of mandible with double row of teeth, outer series of lower triangular teeth, inner row of 3 long, spiniform teeth; erect setae on face strongly spatulate; frons with a distinct raised median carina 5

- Masticatory margin of mandible with single row of teeth; erect setae on face weakly spatulate to simple; frons without a distinct raised median carina 6

5. Larger species (HW 0.83–0.94); basal lobe of scape less developed, SLI < 14 ; vertex of head straight to slightly convex; posterior mesonotum with pronounced longitudinal keel (Fig. 1C) *E. gravis* Mann, 1922

- Smaller species (HW 0.57–0.66); basal lobe of scape strongly developed, SLI > 15 ; vertex of head strongly convex; posterior mesonotum lacking pronounced longitudinal keel *E. xibalba* Longino, 2013

6. Promesonotal dorsum with 3 pairs of large, broadly spatulate setae; projecting setae of face prominent, spatulate, of uniform size, strongly differentiated from ground pilosity; ground pilosity of face more or less uniformly distributed across frons, vertex lobes, and frontal carinae; first gastral ter-



Figure 1. Propodeal spines in some Colombian *Eurhopalothrix* species. Overall, three kinds of propodeal spines can be identified: (A) spine absent, originating a translucent lamella, as seen in *E. amati* n. sp. (IAvH-E-55017), (B) spine reduced but still present, originating a translucent lamella, as seen in *E. pilulifera* (Honduras, CASENT0618717), and (C) well-developed spine, without translucent lamella, *E. gravis* (Costa Rica, CASENT0107554) and most other species. Images modified from AntWeb.org (v8.64.2).

gite with 4 pairs spatulate setae, these of similar size and shape to those on face, distributed in two longitudinal rows

.....*E. bolau*i Mayr, 1870
 - Promesonotal dorsum with 0-2 pairs of filiform to spatulate setae, clearly differentiated from ground pilosity; ground pilosity of face relatively thin and sparse; face often with pair of spatulate setae on outermost angles of sides of head, such that full complement of projecting setae is often 20; first gastral tergite with 4 pairs projecting spatulate setae *E. schmidt*i Menozzi, 1936

TAXONOMY

Order: Hymenoptera Linnaeus, 1758
Superfamily: Formicoidea Latreille, 1809
Family: Formicidae Latreille, 1809
Subfamily: Myrmicinae Lepeletier de Saint-Fargeau, 1835
Genus: *Eurhopalothrix* Brown & Kempf, 1961

Eurhopalothrix amati Fiorentino, Tocora & Fernández, n. sp. (Fig. 2A, 2B, and 2C).

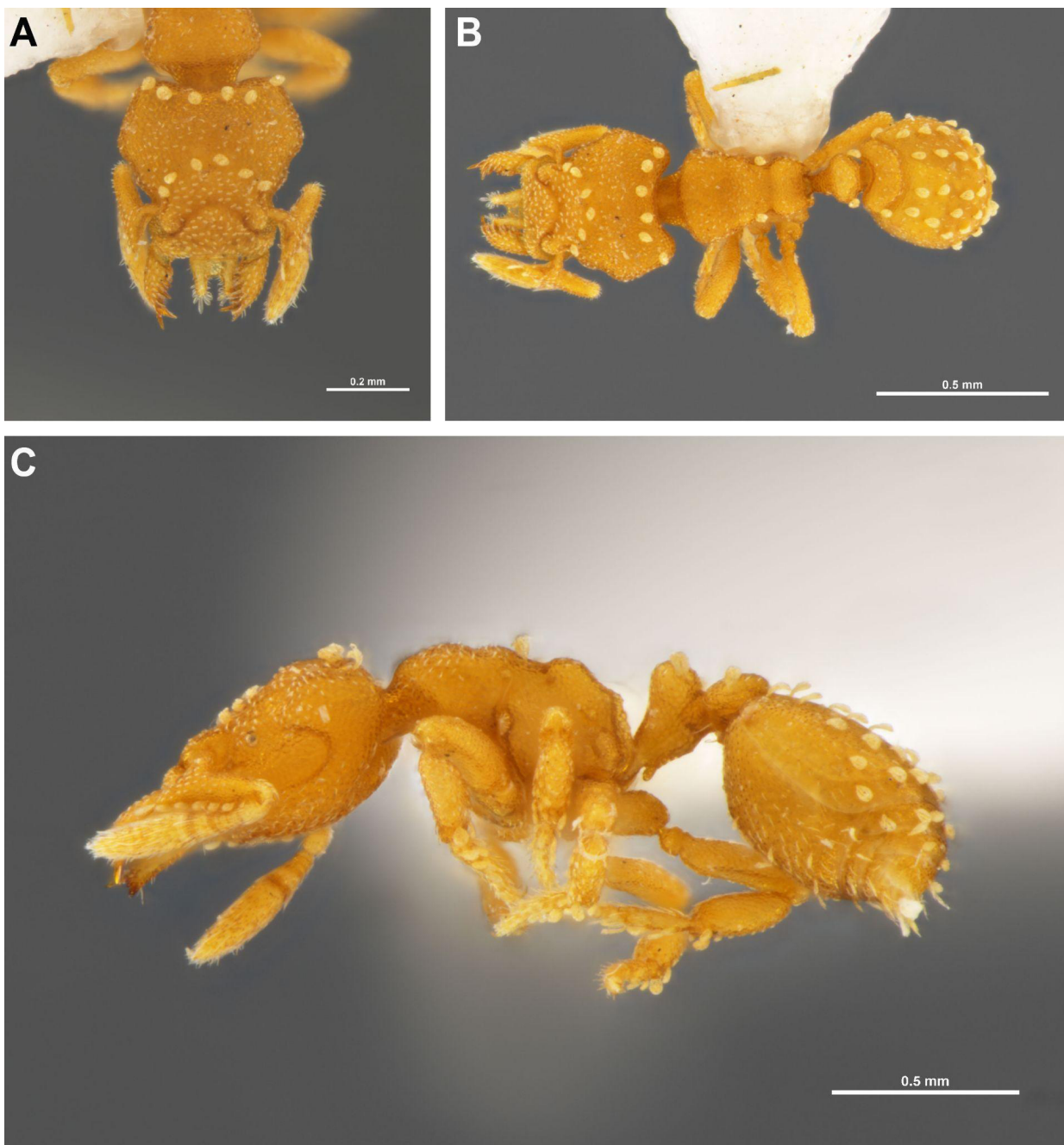


Figure 2. *Eurhopalothrix amati* n. sp. (IAvH-E-55017) A. Frontal view; B. Dorsal view; and C. Lateral view. Scale bars: 0.2 mm (A); 0.5 mm (B-C).

Material examined. Holotype worker. Colombia. Risaralda, Pereira. SFF El Otún Quimbaya, Vda. La Suiza Plantación Urupán 7, transecto 2, 04°43'55.91"N, 75°34'43.93"W, 1870 m, Winkler, coll. Reina, M.F and Franco, L.E. [IAvH-E-55017].

Paratype. 1 Worker. Colombia. Risaralda, Pereira, Vda. La Suiza, Fca. El Amparo de Niños, Bosque maduro 1, 04°44'47.86"N, 75°36'48.98"W, 1810 m, Winkler, coll. Franco, E.L. [IAvH-E-55018].

Additional, non-type material examined. 5 Workers. Colombia: Caldas, Aranzazu, Vda. La Gaura, Fca. Chambery Cañada 5, Trans ect 1, 05°16'58.5"N, 75°28'26.9"W, 1940 m, Winkler, coll. Franco, E.L. and Cruz, J. [IAvH-E-55012]. **Colombia:** Caldas, Aranzazu, Vda. Sabana Larga, Fca. Cañada, 05°18'36.1"N, 75°28'22.8"W, 1920 m, Winkler, coll. Franco, E.L. and Cruz, J. [IAvH-E-5509]. **Colombia:** Caldas, Aranzazu, Vda. La Gaura, Fca. Villa Ofelia, 05°17'8.59"N 75°27'54.0"W, 1965 m, Winkler, coll. Franco, E.L. and Cruz, J. [IAvH-E-5505]. **Colombia:** Antioquia, Támesis, Vda. Alacena, Fca. Villa Fatima, Potrero con rastrojo, 05°42'47.0"N, 75°43'18.6"W, 1900 m, Winkler, coll. García, R. [IAvH-25326]. **Colombia:** Antioquia, Támesis, Vda. Alacena, Fca. Villa Fatima, Potrero con rastrojo, 05°42'47.0"N, 75°43'18.6"W, 1900 m, Winkler, coll. García, R. [IAvH-25324].

Geographic range. Northwestern Colombia (Fig. 3).



Figure 3. Geographic distribution of *Eurhopalothrix amati* n. sp. The black star denotes the type locality.

Diagnosis. Very small species (HW 0.42-0.44). Mandible with single tooth row; face with 12 specialized spatulate setae (anterior row 6, posterior row 6); ground pilosity of face spatulate, decumbent, more abundant on clypeus; eyes minute; propodeal spines translucent, reduced to a laminar corner.

Worker measurements

Holotype: HW 0.44, HL 0.39, SL 0.22, SLL 0.09, ML 0.49, CI 113, SLI 41.

Non type workers (n = 6): HW 0.42-0.44, HL 0.37-0.39, SL 0.22-0.23, SLL 0.07-0.09, ML 0.41-0.49, CI 108-113, SLI 41-54.

Worker description.

Head - In face view, labrum broad and anteriorly bilobed, each lobe ending in 5-7 distinct non-capitate whitish setae; mandible sub-triangular, dorsal surface strongly convex, apical half strongly down-curved, surface punctate; masticatory margin with a single row of ~13 long needle shaped teeth, ninth tooth conspicuously long; scape with very strongly developed basal lobe, anterior half of lobe with sublucid lamella; scrobe deep, sharply delimited dorsally and less so ventrally, sitting below the deep antennal socket; surface of scrobe foveolate; eye minute, comprising 3-4 fused ommatidia; clypeus straight medially with coarse sculpture; sides of head above eyes angulate, surface of face evenly divided into anterior and posterior portions by strongly arcing transverse ridge, ridge terminates at antennal socket below compound eyes; anterior portion rugulose, lacking longitudinal carina; posterior portion flat, feebly rugulose, vertex margin strongly concave; occipital carina distinct; occiput delimited dorsally and ventrally by encircling carina, occiput foveolate; under-surface of head rugulose; postgenal suture a well-developed longitudinal trough.

Mesosoma - Promesonotal profile low, shallowly convex, promesonotal groove deeply impressed dorsally, with distinct carina, posterior margin of promesonotum a short step dropping to sloping face?, dorsal face of propodeum slightly convex; metanotal groove slightly impressed dorsally; dorsal and posterior faces of propodeum distinct, meeting at obtuse angle, dorsal face shorter than posterior face; the posterior face of the propodeum has a longitudinal subrectangular lamella instead of an acute propodeal spine; propodeal spiracle small, directed somewhat posteriorly; entire mesosoma minutely foveolate.

Metasoma - Petiolar peduncle joins anterior face of petiolar node at rounded obtuse angle; anterior face of node meets dorsal face at rounded right angle; posterior face of node short; ventral margin of petiole with large, blunt anteroventral tooth; postpetiole low and broad, with a feeble longitudinal sulcus dorsally; first gastral sternite with anterior sagittal keel; petiole, postpetiole, and gaster densely foveolate.

Pilosity - Dorsal surface of scape distinctly lacking ground pilosity, only present on basal lobe; 3-4 projecting spatulate setae on leading edge of scape; dense ground pilosity on clypeus; ground pilosity of face conspicuous, ground setae decumbent, pompon-like, similar in form to the larger specialized projecting setae, but much smaller, about 1/6 the size, denser medially below anterior row of specialized setae, sparser between anterior and posterior rows; projecting specialized setae large, strongly pompon-like, full complement 12, with curved ante-

rior row of 6 and posterior row of 6 on vertex margin; ground setae similar to those on face sparse on promesonotal dorsum, dorsal half of propodeal spines, moderately abundant on first gastral tergite; 1 pair of projecting spatulate setae on mesonotum; legs with dense, spatulate, subdecumbent setae on entire midtibia, and anterior face of hindtibia, somewhat sparser on other surfaces; apices of tibiae ringed with larger spatulate setae; basitarsus and remaining tarsomeres with abundant, strongly spatulate setae; 1 pair of large projecting spatulate setae on lateral margins of dorsal face of petiolar node; 1 pair of projecting spatulate setae on lateral margins of postpetiole; first gastral tergite with 5-6 rows of projecting spatulate setae.

Queen. Unknown.

Male. Unknown.

Etymology. We named this new species in honor of our mentor, friend and colleague Germán Amat, associate professor at the Institute of Natural Sciences of the National University of Colombia in Bogotá. Germán was a great researcher of the insect fauna of Colombia, with a special interest in scarabaeid beetles. He was also a great explorer and field collector, with many contributions to the knowledge of the fauna of Passali-

dae and other coleopterans. At the University he was always a great teacher, attentive to helping and training many generations of students.

Biology. This is an uncommon species, known only from 7 workers distributed in 5 nearby localities. Collections have been in dry forest and second-growth wet forest habitats, all from Berlese or Winkler samples of forest floor litter and rotten wood, in moderate to high elevations (above 1800 m) in the West Andes of Colombia.

Comments. *Eurhopalothrix amati* n. sp. is likely most closely related to *E. bruchi* Santschi, 1922, as they share a somewhat similar coloration pattern, general mesosoma shape, petiole shape, and propodeal lamellas. These two species can be easily distinguished by the general setation on the face mesosoma and metasoma (abundant specialized setae in *E. amati* vs. only abundant spatulate ground pilosity in *E. bruchi*, lacking any specialized setae) (Fig. 4A-C), the head shape (posterolateral margin meeting the anterolateral margin at a sharp angle, giving head a more triangular appearance in *E. amati* vs. posterolateral margin and anterolateral margin continuously curved, giving head a bilobed and rounded appearance in *E. bruchi*) (Fig. 4A, B), and the mesonotum profile

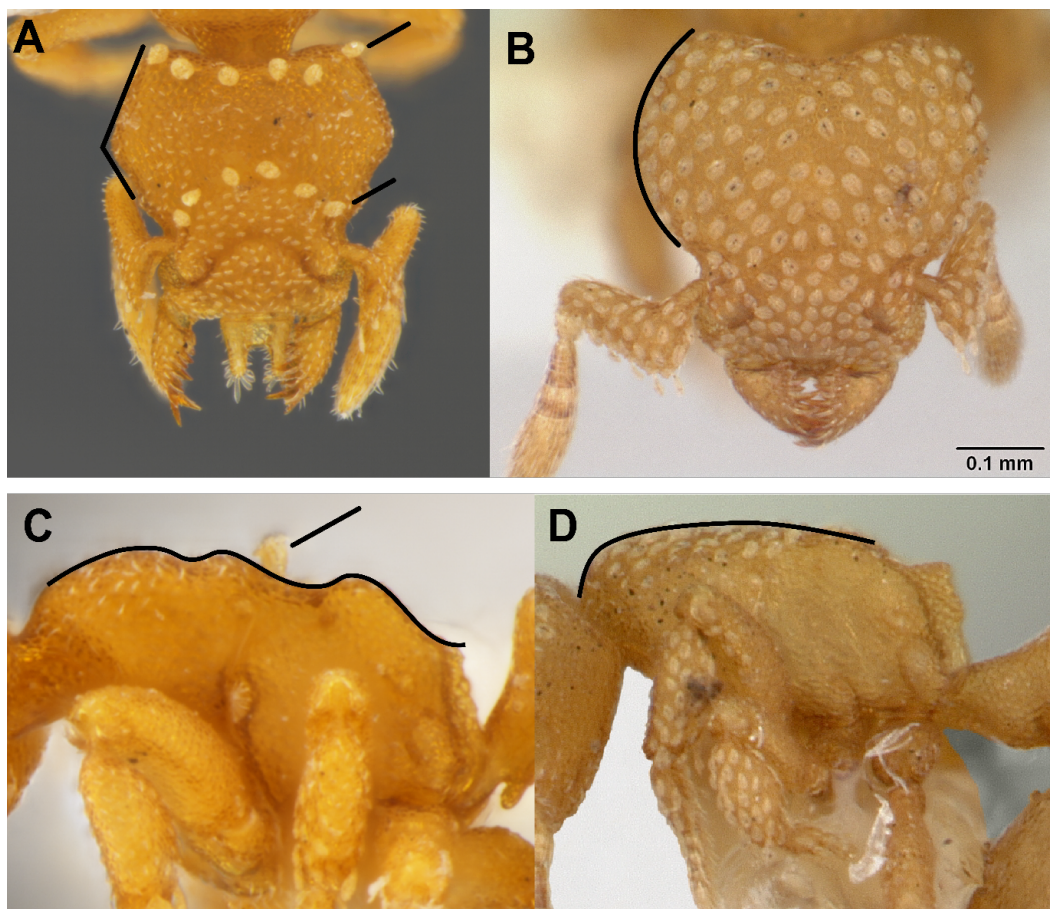


Figure 4. General differences between *E. bruchi* and *E. amati* n. sp. The main differences can be seen on the head capsule (A-B) and the mesonotum profile (C-D): (A) *E. amati* n. sp. head capsule (IAvH-E-55017), (B) *E. bruchi* head capsule (Argentina, CASENT 0173970), (C) *E. amati* n. sp. Mesosoma, (D) *E. bruchi* mesosoma. Lines highlight the head capsule shape (A, B), presence of specialized setae (A-C), and mesosoma profile (C, D).

(irregular, with marked prometanotal and mesonotal grooves in *E. amati* vs. straight in *E. bruchi*) (Fig. 4C, D). Remarkably, *E. amati* n. sp. appears to be smaller than *E. bruchi*, with a HW between 0.42-0.44 vs. 0.45-0.47, making it, perhaps, the smallest known *Eurhopalothrix* species.

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Author contribution

GF, MCT wrote the paper. All authors contributed to the taxonomical description, read and approved the final manuscript.

Conflict of interest

The authors participating in this publication made significant contributions to the manuscript; all authors agree and express that there are no conflicts of interest in this study.