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Research article

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The spider genus *Medionops* Sánchez-Ruiz & Brescovit (Araneae: Caponiidae) in Colombia, with the description of four new species

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Abstract. Four new Colombian species of the spider genus *Medionops* Sánchez-Ruiz & Brescovit, 2017 are described and illustrated: *M. carolinae* sp. nov. (male and female) from Boyacá department, *M. cauca* sp. nov. (male) from Cauca department, *M. luiscarlosi* sp. nov. (male and female) from Caldas department and *M. santarosa* sp. nov. (male) from Risaralda department. Additionally, the distribution of the type species of *M. blades* Sánchez-Ruiz & Brescovit, 2017, previously known only from Bogotá, Cundinamarca department, is extended to several localities in the Boyacá department. An updated identification key for all *Medionops* species is provided.

Keywords. Arachnida, Synspermiata, Nopinae, taxonomy, Neotropical region.

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Introduction

The family Caponiidae Simon, 1890 is an unusual group of ground-wandering spiders, commonly found under rocks, tree trunks and leaf litter. Currently, it is represented by 19 genera and 127 species (World Spider Catalog 2021) occurring in America, Africa and Asia. The generic and specific diversity of the family is certainly great in the New World, where 108 species (15 genera) are known; while only 16 species (two genera) occur in Africa, a single monotypic genus is recorded in Iran and only two species (one genus) are known from Southeast Asia (World Spider Catalog 2021). The Caponiidae are

divided into two subfamilies according to Petrunkevitch (1939): Nopininae, a subfamily exclusive to the New World and probably a monophyletic lineage, which includes those genera with tarsi divided by one or more adesmatic joints (Sánchez-Ruiz & Brescovit 2018), and Caponiinae including all other non-nopine genera.

The Nopininae genus *Medionops* Sánchez-Ruiz & Brescovit, 2017 was proposed by Sánchez-Ruiz & Brescovit (2017) for seven species distributed in Trinidad, Panama, Colombia, Ecuador, Venezuela and Brazil. Members of this genus are characterized by having all legs with an elongated and dorsally reflexed unpaired claw, associated with a large and globose arolium (Sánchez-Ruiz & Brescovit 2017). Previous studies of pretarsal morphology in *Medionops* by Sánchez-Ruiz & Brescovit (2017; 2018) suggest that the genus is closely related to *Nops* MacLeay, 1839 and *Nopsides* Chamberlin, 1924, since some characteristics, such as the elongated unpaired claws and the presence of an arolium, are exclusive to these three genera.

The discovery of *Medionops* by Sánchez-Ruiz & Brescovit (2017) was based on the examination of specimens gathered for the revision of *Nops*, published by Sánchez-Ruiz & Brescovit (2018). Specimens from 30 caponiid collections around the world were examined for the *Nops* revision, nine of which containing specimens later described as *Medionops*, many of them even identified and labeled as *Nops* at that time.

Despite the fairly large sample of Caponiidae examined by Sánchez-Ruiz & Brescovit (2017, 2018), only a few dozen Colombian specimens came to light, none belonging to Colombian collections. As a result, no additional Colombian specimens were revised in either of these two studies. The scarce material reviewed from Colombia led to the fact that, till now, only one species of *Nops* (*N. variabilis* Keyserling, 1877) and one species of *Medionops* (*M. blades* Sánchez-Ruiz & Brescovit, 2017) were recorded from Colombia.

Recent examination of material from a Colombian arachnological collection (Instituto Alexander Von Humboldt), allowed the discovery of four undescribed *Medionops* species. These species are herein described and new distribution records for *M. blades* are given based on material also found in this arachnological collection. A detailed description of somatic and genitalic characteristics, images of the habitus, male palpal morphology and female genital organs, line drawings of the male copulatory bulbs and a distribution map for all Colombian species are provided. Additionally, an updated identification key for all species of the genus is presented.

Material and methods

Morphological observations and illustrations were made using a Leica MC125 stereo microscope with a camera lucida. Multifocal images were taken with Leica MC-190 HD and Leica MC-170 HD digital cameras attached to Leica S8AP0 and Leica MC125 stereo microscopes, respectively, with extended focal range. All multifocal images were assembled using Helicon Focus Pro ver. 5.3.14. Measurements are provided in millimeters (mm) and were made using an ocular micrometer. Descriptions and measurements follow Sánchez-Ruiz & Brescovit (2017). Coloration patterns were described based on specimens preserved in 70–80% ethanol. All type specimens are in good conditions of preservation; the left male palp and female internal genitalia of holotypes and paratypes were dissected for detailed examination and documentation and stored in microvials inside their respective vials. The terminology for copulatory structures follows Sánchez-Ruiz *et al.* (2015). For *M. blades*, the female genitalia were dissected with fine forceps and scalpel and their soft tissues were digested for 24 hours within a solution of pancreatin following Álvarez-Padilla & Hormiga (2007). For the remaining species the female genitalia were extracted in the same way but digested with Ultrazime® contact lens cleaner enzyme (1 tablet/5 ml distilled water).

The digital photos were edited using Adobe Photoshop® CS ver. 12.0 and figures were edited with Corel Draw® X7 ver. 17.1. Maps were prepared in QGIS (QGIS Development Team 2021). All locality coordinates were obtained from specimen labels and converted to the DMS format (degrees, minutes and seconds). Locality elevations refer to meters above sea level in all cases.

Institutional abbreviations

IAvH = Instituto Alexander Von Humboldt (curator: J.C. Neita), Bogotá, Colombia
 AMNH = American Museum of Natural History (curator: L. Prendini), New York, USA

Abbreviations for morphological terms used in the figures

ap = anterior plate
 b = area below genital opening
 e = embolus
 ess = external sclerotization around spiracles
 go = genital opening
 mc = median concavity on receptaculum
 re = receptaculum
 t = tegulum
 ue = uterus externus

Results

Taxonomy

Class Arachnida Cuvier, 1812
 Order Araneae Clerck, 1757
 Family Caponiidae Simon, 1890

Genus *Medionops* Sánchez-Ruiz & Brescovit, 2017

Updated key to the species of *Medionops* Sánchez-Ruiz & Brescovit, 2017

1. Abdomen dorsally with remarkable pattern of gray chevrons or stains (Figs 1A, C, 2A, C, 3A) 2
 - Abdomen dorsally with unremarkable pattern of very fine gray chevron lines, almost unnoticeable (Sánchez-Ruiz & Brescovit 2017: figs 17a–b, 20a) 10
2. Abdomen dorsally with five pairs of irregular dark gray stains forming two longitudinal bands (Sánchez-Ruiz & Brescovit 2017: figs 18a–b, 10a) 3
 - Abdomen dorsally with five whitish gray chevron stripes, which decrease in size towards the posterior part of abdomen (Figs 1A, C, 2A, C, 3A) 4
3. Dorsal irregular dark gray stains on abdomen very close to each other, almost touching (Sánchez-Ruiz & Brescovit 2017: fig. 18a–b); crista very short; body more than 5 mm total length *M. simla* (Chickering, 1967)
 - Dorsal irregular dark gray stains on abdomen widely separated from each other, not touching (Sánchez-Ruiz & Brescovit 2017: fig. 10a); crista absent (Sánchez-Ruiz & Brescovit 2017: fig. 9k); body less than 3 mm total length *M. claudiae* Sánchez-Ruiz & Brescovit, 2017
4. Gladius absent (Sánchez-Ruiz & Brescovit 2017: figs 11c–d, F, 13b–c)
 - *M. murici* Sánchez-Ruiz & Brescovit, 2017
- Gladius present (Dupérré 2014: fig.4; Sánchez-Ruiz & Brescovit 2017: figs 3g, 9k, 15e) 5

5. Crista short but noticeable (Sánchez-Ruiz & Brescovit 2017: fig. 3g, j), reaching at least $\frac{1}{4}$ or $\frac{1}{5}$ of metatarsal length 6
 - Crista unnoticeable (Sánchez-Ruiz & Brescovit 2017: fig. 15e–f), only $\frac{1}{6}$ or less of metatarsal length, or absent 7
6. Males embolus tip with several blade-shaped projections (Sánchez-Ruiz & Brescovit 2017: fig. 2j–l); female posterior plate with internally projected median septum (Sánchez-Ruiz & Brescovit 2017: fig. 4j–l) *M. blades* Sánchez-Ruiz & Brescovit, 2017
 - Males with smooth embolus tip, without projections (Sánchez-Ruiz & Brescovit 2017: fig. 7d–e); female posterior plate without internally projected median septum (Sánchez-Ruiz & Brescovit 2017: fig. 7g–i) *M. cesari* (Dupérré, 2014)
7. Abdomen dorsally with pattern of five large, wide whitish gray chevrons, which reach the lateral whitish gray spots (Figs 2A, C, 3A), ventrally with a pair of longitudinal stripes occupying only the posterior third of the abdomen (Figs 2B, D, 3B); males with bulb greater than patella length (Fig. 2E–F) 8
 - Abdomen dorsally with pattern of five small, narrow whitish gray chevrons, that never reach the lateral whitish gray spots (Figs 4A, C, 5A), ventrally without a pair of longitudinal stripes (Figs 4B, D, 5B); males with bulb equal to or smaller than the patella length (Fig. 4E–F) 9
8. Embolus slightly curved anteriorly, tip with accentuated curvature (Fig. 2E–F)
 - *M. carolinae* sp. nov. (only males)
 - Embolus strongly angled at base and slightly sinuous (Figs 3C–D, 7C), tip almost straight (Fig. 3C–D) *M. cauca* sp. nov. (only males)
9. Embolus more than $3 \times$ the maximum tegular width, tip pointed (Fig. 4E–F)
 - *M. luiscarlosi* sp. nov. (only males)
 - Embolus less than $3 \times$ the maximum tegular width, tip truncated (Fig. 5C–D)
 - *M. santarosa* sp. nov. (only males)
10. Crista short but noticeable, not reaching one fourth of metatarsal length; body more than 4.5 mm total length; males with embolus length more than $3 \times$ the maximum diameter of the tegulum (Sánchez-Ruiz & Brescovit 2017: fig. 19g–h), known only from Venezuela *M. tabay* Sánchez-Ruiz & Brescovit, 2017
 - Crista unnoticeable (Sánchez-Ruiz & Brescovit 2017: fig. 15d–f); body less than 3.5 mm total length; males with embolus length over less than $3 \times$ the maximum diameter of the tegulum (Sánchez-Ruiz & Brescovit 2017: fig. 16a–b), known only from southeast coast of Brazil *M. ramirezi* Sánchez-Ruiz & Brescovit, 2017

Medionops blades Sánchez-Ruiz & Brescovit, 2017

Figs 1, 6, 7A, 8A–B

Medionops blades Sánchez-Ruiz & Brescovit 2017: 122, figs 1e, 2a–l, 3a–l, 4a–l, 5a–l, 6a–e (♀♂).

Medionops blades – Sánchez-Ruiz, Brescovit & Bonaldo 2020: 485, fig. 19e (♂).

Diagnosis

Males resemble those of *M. carolinae* sp. nov. in having similar copulatory bulb shape, but can be distinguished by the straighter embolus tip and by the size of the tegulum, only $\frac{1}{2}$ as long as the cymbium length (Figs 1E–F, 7A) (in *M. carolinae* sp. nov., only $\frac{1}{3}$ as long, Figs 2E–F, 7B). Females of *M. blades*

differ from those of *M. carolinae* sp. nov. by the wide, concave area below the genital opening (Fig. 1G) (in *M. carolinae* sp. nov., narrower and triangular, Fig. 2G).

Material examined

Holotype

COLOMBIA • ♂; Cundimarca department, Páramo de Monserrate, 40 km NE of Bogotá; 4°36' N, 74°3' W; alt. 2920 m; 23 Jul. 1968; H. Sturm leg.; AMNH.

Paratype

COLOMBIA • 1 ♀; same collection data as for holotype; AMNH.

Additional material

COLOMBIA – **Boyacá department** • 1 ♂; Sotaquirá, Vereda Cuaguani; 5°48'32.8" N, 73°15'10.9" W; alt. 3502 m; 8–10 Jun. 2015; Y. Cifuentes and J. Moreno leg.; IAvH-I 3381 • 1 ♂; Paipa, Parque Municipal Ranchería; 05°51'08.1" N, 73°08'23.1" W; alt. 3554 m; 21 Dec. 2014; J. Barrera, M. Castro and S. Mondragón leg.; IAvH-I 3391 • 1 ♂; same collection data as for preceding; 05°50'56.6" N, 73°07'46.8" W; alt. 3390 m; 15–21 Dec. 2014; IAvH-I 3401 • 1 ♂; same collection data as for preceding; 05°50'57.3" N, 73°07'46.8" W; alt. 3392 m; 15–21 Dec. 2014; IAvH-I 3411 • 1 ♂, 1 ♀; same collection data as for preceding; IAvH-I 3382 • 1 ♂; Chaina, Santuario de Flora y Fauna Iguaque, Sector Chaina; 5°25' N, 73°27' W; alt. 2730 m; 11 Jul. 2001; J. Barrera and B. Robles leg.; IAvH-I 3773 • 1 ♂; Sector Chaina, Quebrada Los Mudos; 5°44' N, 73°26' W; alt. 2840 m; 5–9 Oct. 2002; P. Reina leg.; IAvH-I 3774.

Natural history

The holotype was found in the Andean moorland complex of the eastern hills of Colombia (Fig. 8A–B) which is predominantly populated by plant species such as *Espeletia grandiflora* Humb. & Bonpl. and *Cupressus* sp.

Description

Male and female described by Sánchez-Ruiz & Brescovit (2017).

Variation

Males from the Boyacá department population (Fig. 1A–B) have the embolus tip somewhat more curved than those from Cundinamarca department (see images from types in Sánchez-Ruiz & Brescovit 2017: figs 2h, 6d). Females from the Boyacá population (Fig. 1G) have a narrower and more sclerotized area under the genital opening than those from the Cundinamarca population.

Distribution

Known from Cundinamarca and Boyacá in Colombia (Fig. 6).

Medionops carolinae sp. nov.

[urn:lsid:zoobank.org:act:CD71F419-D3D8-4CED-AD43-08785FB0C57D](https://zoobank.org/act:CD71F419-D3D8-4CED-AD43-08785FB0C57D)

Figs 2, 6, 7B, 8C–F

Diagnosis

Males resemble those of *M. blades* in having a similar copulatory bulb shape, but can be distinguished by the accentuate curvature on the embolus tip (straighter in *M. blades*) and by the tegulum $\frac{1}{2}$ as long as the cymbium (Figs 2E–F, 7B) ($\frac{1}{2}$ as long in *M. blades*, Figs 1E–F, 7A). Females of *M. carolinae* sp. nov.

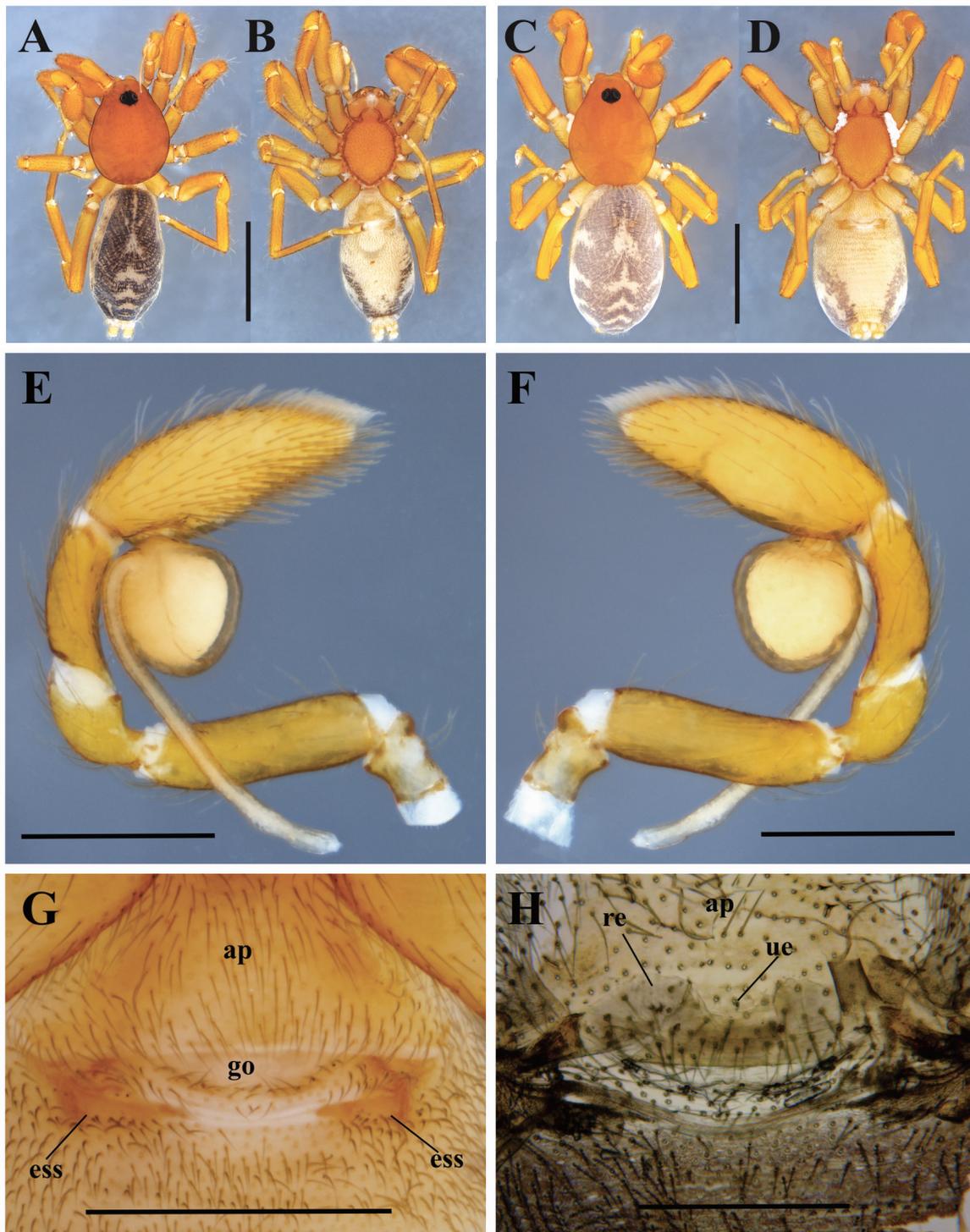


Fig. 1. *Medionops blades* Sánchez-Ruiz & Brescovit, 2017. **A–B, E–F.** Male, Boyacá population (IAvH-I 3381). **C–D, G–H.** Female, Boyacá population (IAvH-I 3382). **A.** Habitus, dorsal view. **B.** Habitus, ventral view. **C.** Habitus, dorsal view. **D.** Habitus, ventral view. **E.** Left palp, retrolateral view. **F.** Left palp, prolateral view. **G.** External genitalia, ventral view. **H.** Internal genitalia, dorsal view. Scale bars: A–D = 1.5 mm; E–F = 0.7 mm; G = 0.5 mm; H = 0.2 mm. Abbreviations: ap = anterior plate; ess = external sclerotization around spiracles; go = genital opening; re = receptaculum; ue = uterus externo.

differ from those of *M. blades* by the narrow, triangular area below the genital opening (Fig. 2G) (wider and concave in *M. blades*, Fig. 1G).

Etymology

The specific name is a patronym in honor of Carolina Gomez, director of the collections of the Institute Alexander Von Humboldt, Bogotá, Colombia.

Type material

Holotype

COLOMBIA • ♂; Boyacá department, Sutamarchán; 5°45'1" N, 73°40'2" W; alt. 3220 m; 9–11 Apr. 2003; E. González and C. Reina leg.; IAvH-I 3782.

Paratypes

COLOMBIA – **Boyacá department** • 1 ♂; same collection data as for holotype; IAvH-I 3781 • 1 ♀; Sector Carrizal, Santuario de Flora y Fauna Iguaque; 5°42'13" N, 73°27'18" W; alt. 2910 m; 4–11 Nov. 2006; J. Arias and P. Delgado leg.; IAvH-I 3771 • 1 ♂; Arcabuco, Vereda Rupavita; 5°44'26.5" N, 73°23'2.3" W; alt. 3340 m; 25–27 Feb. 2015; Y. Cifuentes and D. Espejo leg.; IAvH-I 3343.

Description

Male (holotype, Figs 2A–B, E–F, 7B)

MEASUREMENTS. Total length 4.94. Carapace 2.01 long, 1.49 wide. Sternum 1.23 long, 1.02 wide. Legs: I: 4.61; II: 4.59; III: 3.91; IV: 5.82.

COLORATION. Carapace, chelicerae, sternum, labium and endites reddish (Fig. 2A–B). Palps and legs light orange. Abdomen dorsally dark gray with dorsal pattern formed by five wide light chevron stripes, medially joined by thin longitudinal band; ventrally whitish gray (Fig. 2A–B).

LEGS AND PALPS. Crista absent or unnoticeable; gladius with common nopine shape. Palp with small globose tegulum and embolus slightly curved anteriorly, tip with accentuated curvature with subdistal modification and beveled opening (Figs 2E–F, 7B, G).

Female (paratype, Fig. 2C–D, G–H)

MEASUREMENTS. Total length 5.91. Carapace 2.11 long, 1.74 wide. Sternum 1.33 long, 1.08 wide. Legs: I: 5.01; II: 4.36; III: 3.51; IV: 5.74.

COLORATION. As in the male (Fig. 2C–D).

GENITALIA. External genitalia with narrow, triangular area below genital opening (Fig. 2G); internal genitalia not studied (internal membranous structures completely destroyed during enzymatic digestion, Fig. 2H).

Variation

Males (n = 3): total length: 4.72–4.94; carapace length: 2.01–2.05.

Natural history

All types were collected with pitfall traps baited with human excrement, used to collect dung beetles and ants, mainly in frailejón plants (*Espeletia grandiflora* Humb. & Bonpl.) and grassland. Specimens belonging to ant-eating spiders such as Zadariidae Thorell, 1881 were collected together with *Medionops* in large numbers, probably due to the high availability of prey. Aspects on the natural history of Nopinae spiders are poorly known and only a few studies on the trophic specialization of *Nops* have been done (see

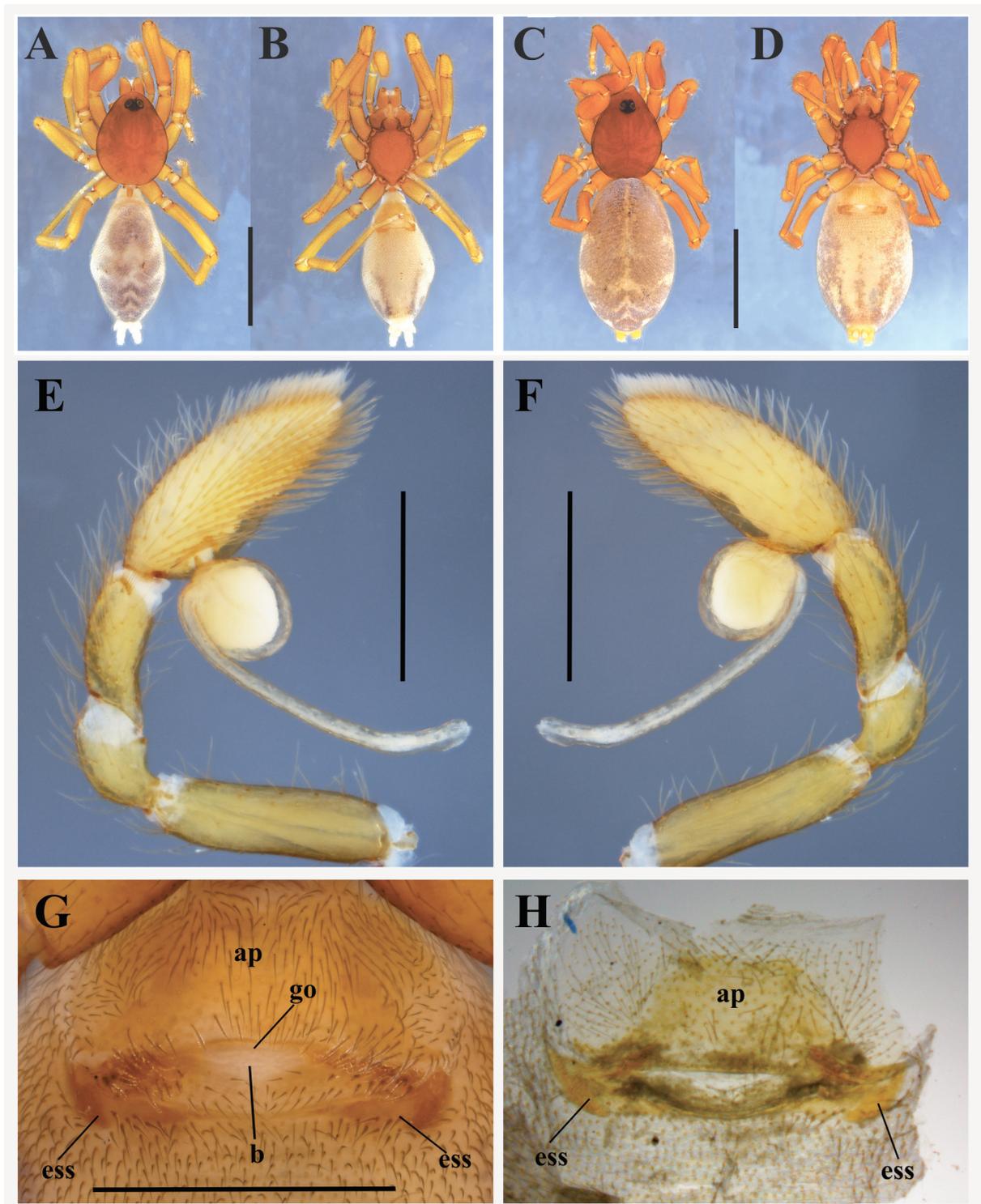


Fig. 2. *Medionops carolinae* sp. nov. **A–B, E–F.** Holotype, ♂ (IAvH-I 3782). **C–D, G–H.** Paratype, ♀ (IAvH-I 3771). **A.** Habitus, dorsal view. **B.** Habitus, ventral view. **C.** Habitus, dorsal view. **D.** Habitus, ventral view. **E.** Left palp, retrolateral view. **F.** Left palp, prolateral view. **G.** External genitalia, ventral view. **H.** Internal genitalia, dorsal view. Scale bars: A–D = 1.5 mm; E–F = 0.7 mm; G = 0.5 mm; H = 0.2 mm. Abbreviations: ap = anterior plate; b = area below genital opening; ess = external sclerotization around spiracles; go = genital opening.

García *et al.* 2018; Teruel & Sánchez-Ruiz 2000). These studies highlight the remarkable preference of some nopine species for feeding on arachnids (little scorpions and other spiders). Although no detailed studies have been conducted, the adhesive membranous structures (crista and gladius) on the first two pairs of nopine legs are probably involved in the prey capture process.

Distribution

Known only from Boyacá department, Colombia (Fig. 6).

Remarks

The holotype was found in a high Andean humid forest (Fig. 8C–D) and the female paratype was found in a protected area (Sanctuary of Flora and Fauna Iguaque) where human intervention is limited (Fig. 8E–F). The record of this female specimen is separated by only 24 km from the type locality and 8 km from the most distant examined specimen located outside the type locality. The height above sea level between type and female localities hardly differs by about 300 m and even the environments are very similar in both locations (Fig. 8C–F). We tentatively matched this female with males from the type locality by similarities in the coloration pattern, but confirmation of this association will be possible only when more samples come to light. We believe that proposing this doubtful association is preferable to making available a possibly unnecessary specific name.

Medionops cauca sp. nov.

[urn:lsid:zoobank.org:act:A686E3FD-E3A4-4093-8BCD-6B3DE54C6B50](https://doi.org/10.21203/rs.3.rs-10000000/v1)

Figs 3, 6, 7C

Diagnosis

Males of *M. cauca* sp. nov. are readily recognized from other species of *Medionops* by the embolus strongly angled at the base and slightly sinuous (Figs 3C–D, 7C). Females unknown.

Etymology

The specific epithet refers to the type locality ‘Cauca department’; noun in apposition.

Type material

Holotype

COLOMBIA • ♂; Cauca department, Parque Natural Nacional Isla Gorgona, Antigua Laguna Claro; 2°58′ N, 78°11′ W; alt. 70 m; 11 Apr. 2000; R. Duque leg.; IAvH-I 3788.

Description

Male (holotype, Figs 3A–D, 7C)

MEASUREMENTS. Total length 3.84. Carapace 1.76 long, 1.34 wide. Sternum 1.06 long, 0.86 wide. Legs: I: 3.61; II: 3.43; III: 2.79; IV: 4.15.

COLORATION. Carapace, chelicerae, sternum, palps and legs orange (Fig. 3A); coxae, trochanters and tarsi lighter. Endites and labium light orange (Fig. 3B). Abdomen dorsally dark gray with dorsal pattern formed by five whitish gray chevron stripes, medially joined by thin longitudinal band, and laterally extended as thin stripes; ventrally yellowish (Fig. 3A–B).

LEGS AND PALPS. Crista unnoticeable; gladius with common nopine shape. Palp with spherical oval tegulum and slightly sinuous embolus longer than cymbium and strongly angled at base (Figs 3C–D, 7C), with acuminate tip and rounded opening.

Female
Unknown.

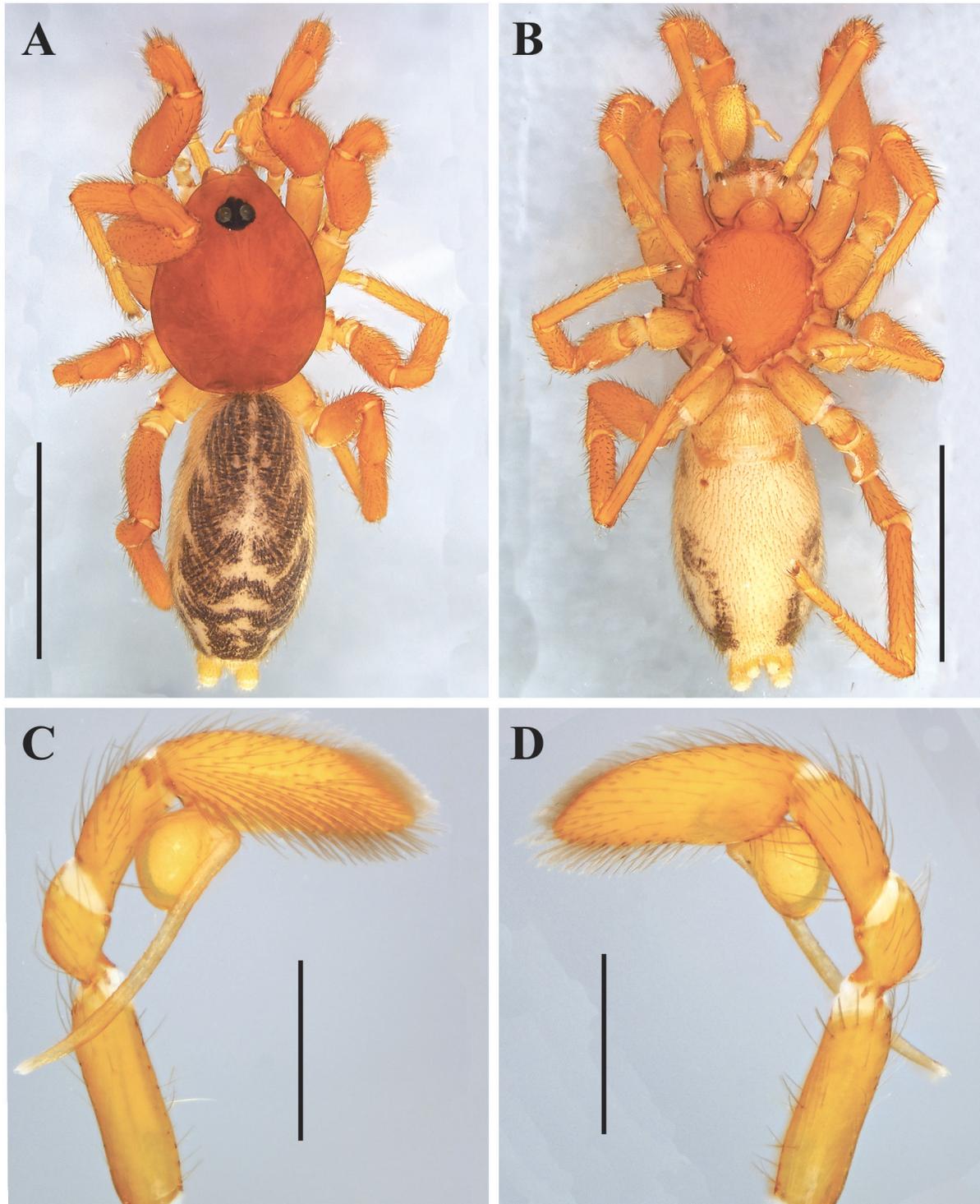


Fig. 3. *Medionops cauca* sp. nov., holotype, ♂ (IAvH-I 3788). **A.** Habitus, dorsal view. **B.** Habitus, ventral view. **C.** Left palp, retrolateral view. **D.** Left palp, prolateral view. Scale bars: A–B = 1.5 mm; C–D = 0.5 mm.

Distribution

Known only from the type locality in Colombia (Fig. 6).

Medionops luiscarlosi sp. nov.

[urn:lsid:zoobank.org:act:96AC990B-8993-478A-A4FD-2BEE997C0347](https://doi.org/10.21203/rs.3.rs-10000000)

Figs 4, 6, 7D

Diagnosis

Males resemble those of *M. santarosa* sp. nov. in having a similar copulatory bulb shape, but can be distinguished by the embolus length more than $3 \times$ the maximum tegular width, with pointed tip (Figs 4E–F, 7D) (shorter, with truncated tip in *M. santarosa* sp. nov., Figs 5C–D, 7E). Females are distinguished from those of all other species by the flat median concavity on the receptaculum (Fig. 4H).

Etymology

The specific name is a patronym in honor of Luis Carlos Gutierrez, an unforgettable professor from the Universidad del Atlántico in Colombia who passed away in 2021.

Type material

Holotype

COLOMBIA • ♂; Caldas department, Pensilvania, Berlín; 5°21'08" N, 75°11'10" W; alt. 2750 m; 24–26 Jul. 2004; E. González and L. Arango leg.; IAvH-I 3361.

Paratypes

COLOMBIA • 1 ♂; Caldas department, Pensilvania, Finca La Cabaña; 5°22'05" N, 75°10'12" W; alt. 2650 m; 30 Jul.–Aug. 2004; E. González, L. Arango and J. Montes leg.; IAvH-I 3352 • 1 ♀; same collection data as for preceding; IAvH-I 3772.

Description

Male (holotype, Figs 4A–B, E–F, 7D)

MEASUREMENTS. Total length 3.65. Carapace 1.60 long, 1.21 wide. Sternum 0.98 long, 0.81 wide. Legs: I: 3.68; II: 3.45; III: 2.89; IV: 3.84.

COLORATION. Carapace, chelicerae, palps and legs orange (Fig. 4A); coxae and trochanters lighter (Fig. 4B). Endites, labium and sternum light orange (Fig. 4B). Abdomen dorsally with dorsal pattern of five small, thin, whitish gray chevron stripes, not extending laterally (Fig. 4A); ventrally yellowish gray (Fig. 4B).

LEGS AND PALPS. Crista unnoticeable; gladius with common nopine shape. Palps with spherical tegulum with small projection on posterior side, embolus length more than $3 \times$ the maximum width of tegulum, with pointed tip (Figs 4E–F, 7D), tip of embolus slightly curved and sharp, with small opening.

Female (paratype, Fig. 4C–D, G–H)

MEASUREMENTS. Total length 4.49. Carapace 1.92 long, 1.42 wide. Sternum 1.10 long, 0.85 wide. Legs: I: 4.13; II: 3.82; III: 3.31; IV: 4.53.

COLORATION. As in male (Fig. 4C–D).

LEGS AND PALPS. Crista and gladius as in male. External genitalia with white triangular area below genital opening (Fig. 4G), internal genitalia with flat median concavity on receptaculum (Fig. 4H).

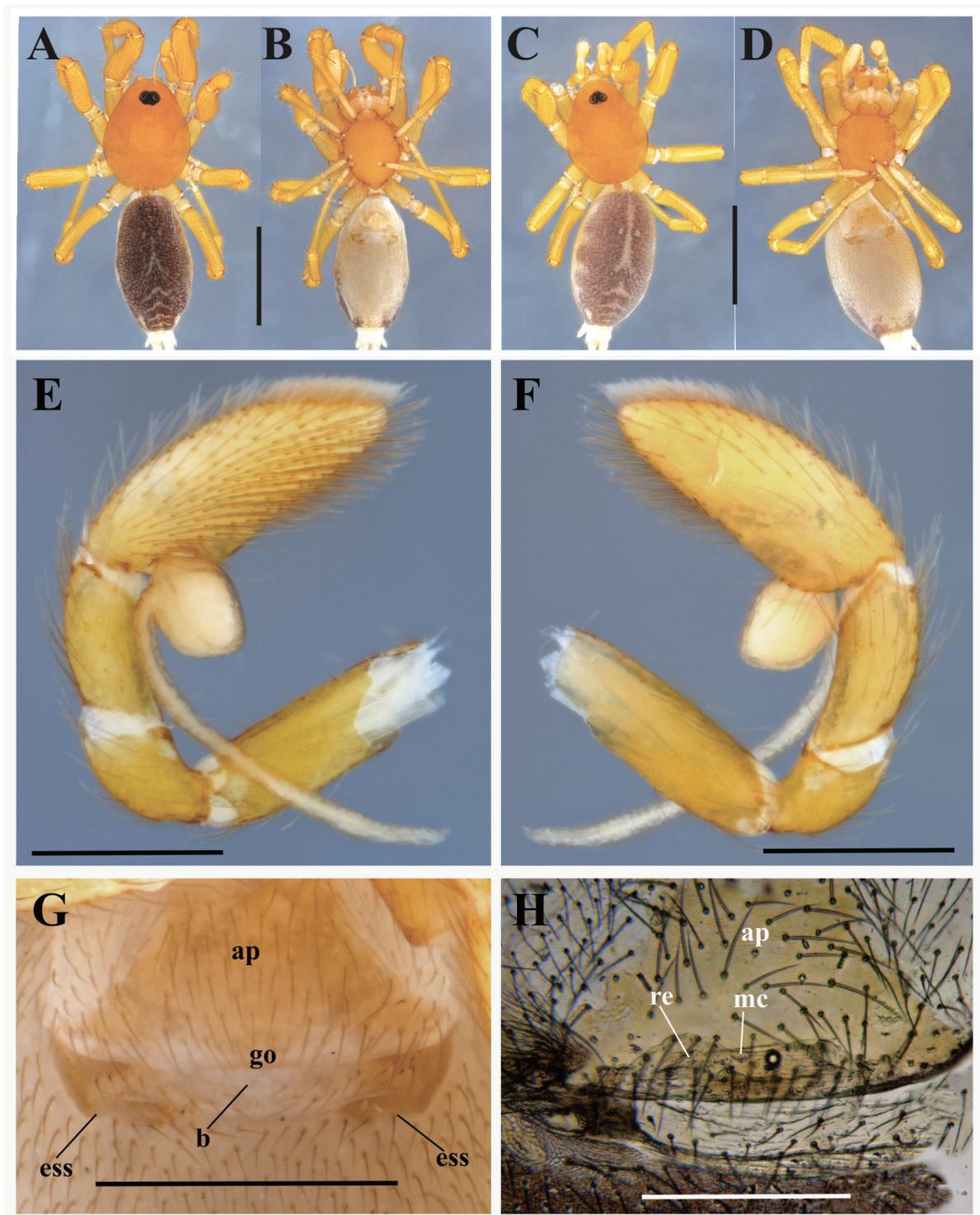


Fig. 4. *Medionops luiscarlosi* sp. nov. **A–B, E–F.** Holotype, ♂ (IAvH-I 3361). **C–D, G–H.** Paratype, ♀ (IAvH-I 3772). **A.** Habitus, dorsal view. **B.** Habitus, ventral view. **C.** Habitus, dorsal view. **D.** Habitus, ventral view. **E.** Left palp, retrolateral view. **F.** Left palp, prolateral view. **G.** External genitalia, ventral view. **H.** Internal genitalia, dorsal view. Scale bars: A–D = 1.5 mm; E–F = 0.7 mm; G = 0.5 mm; H = 0.2 mm. Abbreviations: p = anterior plate; b = area below genital opening; ess = external sclerotization around spiracles; go = genital opening; re = receptaculum; mc = median concavity.

Variation

Males (n = 2): total length: 3.35–3.65; carapace length: 1.60–1.72.

Distribution

Known from two localities in Caldas department, Colombia (Fig. 6).

Remark

All type specimens were collected with pitfall traps.

Medionops santarosa sp. nov.

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Figs 5–6, 7E

Diagnosis

Males resemble those of *M. luiscarlosi* sp. nov. in having a similar copulatory bulb shape but can be distinguished by the embolus length less than $3 \times$ the maximum width of the tegulum, with truncated tip (Figs 5C–D, 7E) (larger, with pointed tip in *M. luiscarlosi*, Figs 4E–F, 7D). Females unknown.

Etymology

The specific epithet refers to the type locality ‘Santa Rosa de Cabal’; noun in apposition.

Type material

Holotype

COLOMBIA • ♂; Risaralda department, Parque Municipal Natural Campo Alegre, Santa Rosa de Cabal, Vereda La Linda, Finca La Granja; 4°52′26″ N, 75°31′21″ W; alt. 2490–2659 m; 26–28 Feb. 2004; A. Pulido and Y. Martínez leg.; IAvH-I 3362.

Paratypes

COLOMBIA • 1 ♂; same collection data as for holotype; IAvH-I 3371 • 1 ♂; same collection data as for holotype; IAvH-I 3372.

Description

Male (holotype, Figs 5A–D, 7E)

MEASUREMENTS. Total length 4.31. Carapace 1.83 long, 1.38 wide. Sternum 1.10 long, 0.85 wide. Legs: I: 4.09; II: 3.75; III: 3.31; IV: 4.81.

COLORATION. Carapace, chelicerae, sternum, labium and endites reddish (Fig. 5A). Palps and legs light orange (Fig. 5B). Abdomen dorsally dark gray, with dorsal pattern of five small, thin, whitish gray chevron stripes, not extending laterally (Fig. 5A); ventrally yellowish gray (Fig. 5B).

LEGS AND PALPS. Crista unnoticeable; gladius with the common nopine shape. Palp with spherical tegulum; embolus length less than $3 \times$ the maximum width of the tegulum, with truncated tip (Figs 5C–D, 7E) and rounded opening.

Female

Unknown.

Variation

Males (n = 3): total length: 3.74–4.31; carapace length: 1.73–1.83.

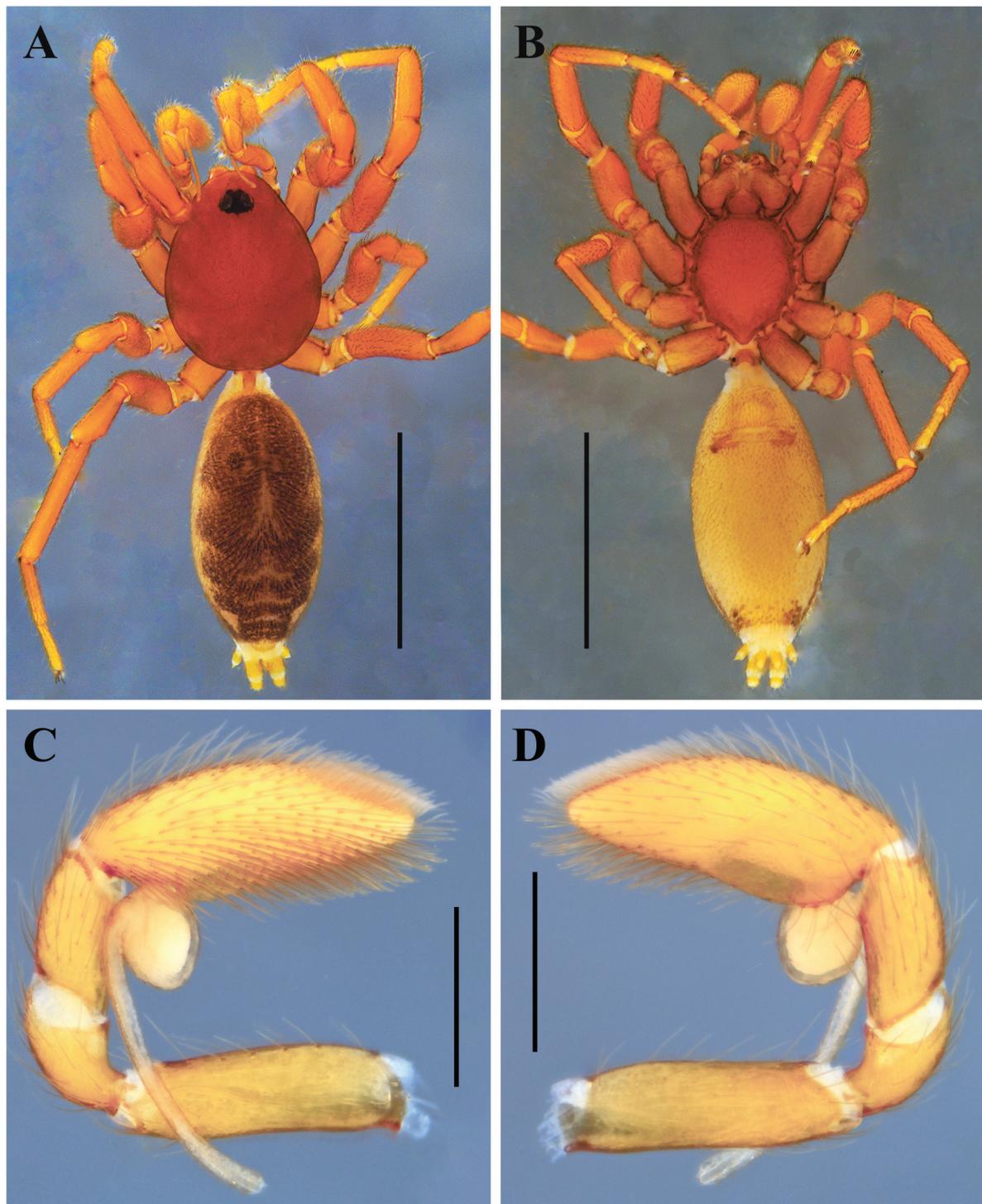


Fig. 5. *Medionops santarosa* sp. nov., holotype, ♂ (IAvH-I 3362). **A.** Habitus, dorsal view. **B.** Habitus, ventral view. **C.** Left palp, retrolateral view. **D.** Left palp, prolateral view. Scale bars: A–B = 1.5 mm; C–D = 0.5 mm.

Distribution

Known only from the type locality in Colombia (Fig. 6).

Discussion

The present study increases from one to five the number of Colombian *Medionops* species recorded. All these species are known from only a few localities within the country. Among the nopines, *Medionops* is one of the few genera presenting all three membranous structures of the pretarsal morphology (crista, gladius and arolium) that appear in members of this subfamily (Sánchez-Ruiz & Brescovit 2018). These three membranous structures have been known since Keyserling (1877), who was the first to detect them; however their characteristics remained little studied until Sánchez-Ruiz & Brescovit (2017) standardized their terminologies. The arolium is present only in *Nops*, *Nopsides* and *Medionops*, while the adhesive structures crista and gladius are more common within the nopines. *Nyctnops* is the only nopine lineage that does not have any of these three structures (Platnick & Lise 2007). The arolium is evolutionarily related to the elongated unpaired claw, since the unpaired claws became elongated to shelter an enlarged arolium (Sánchez-Ruiz & Brescovit 2018). However, *Nops* species are characterized by a very short or reduced arolium, yet the anterior unpaired claws are elongated in all species, and only in a few species are the posterior unpaired claws not elongated. Conversely, *Medionops* and *Nopsides* are characterized by a large arolium and an elongated unpaired claw (Sánchez-Ruiz & Brescovit 2018). Generally, the gladius is homogeneous in size and shape in all lineages that present this structure. Within the nopines with gladius, *Medionops* is the only genus with at least one species lacking this structure (*M. murici* Sánchez-Ruiz & Brescovit, 2017); coincidentally, the crista is also absent in this Brazilian species. This would be the first documented instance of gladius and crista loss within a nopine genus. The crista is also

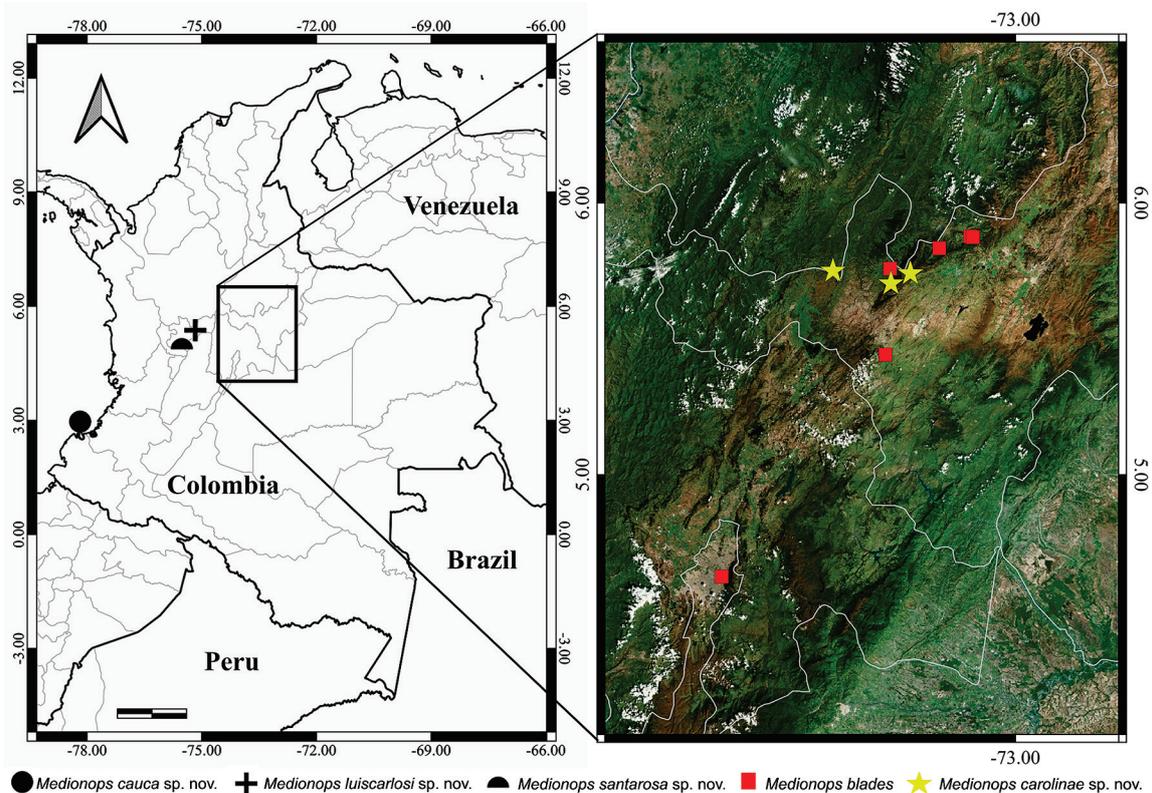


Fig. 6. Distribution map of Colombian species of *Medionops* Sánchez-Ruiz & Brescovit, 2017.

fairly homogeneous among genera, but *Medionops* again diverges from that pattern, presenting diverse conformations of crista shape and size across species. This genus is generally characterized by a very short crista, but it's unnoticeable in *M. ramirezi* Sánchez-Ruiz & Brescovit 2017 and completely absent

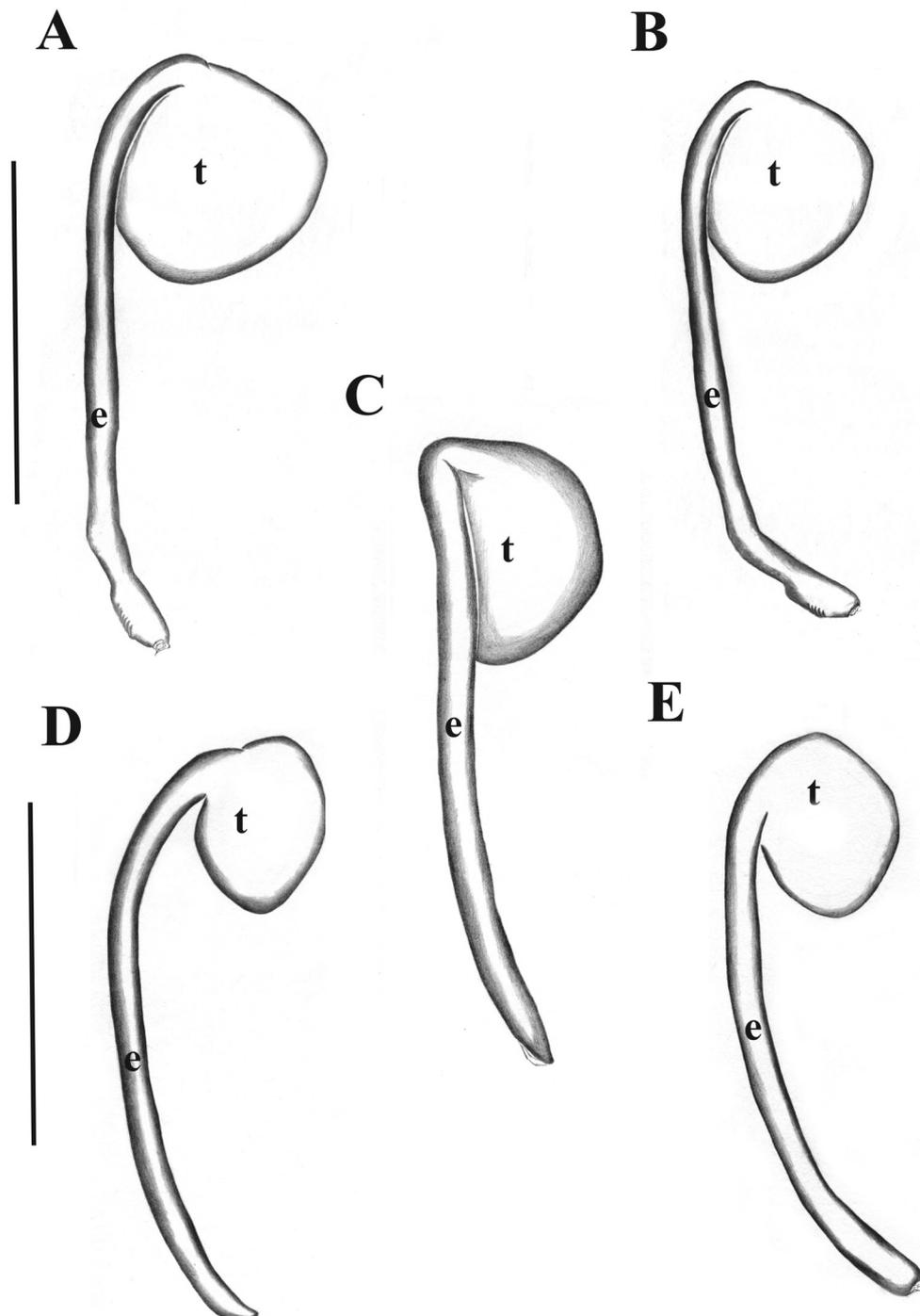


Fig. 7. Drawings of the male copulatory bulbs (retrolateral view) in Colombian species of *Medionops* Sánchez-Ruiz & Brescovit, 2017. **A.** *M. blades* Sánchez-Ruiz & Brescovit, 2017. **B.** *M. carolinae* sp. nov. **C.** *M. cauca* sp. nov. **D.** *M. luiscarlosi* sp. nov. **E.** *M. santarosa* sp. nov. Scale bars = 0.5 mm. Abbreviations: e = embolus; t = tegulum.

in *M. claudiae* Sánchez-Ruiz & Brescovit, 2017 and *M. murici* Sánchez-Ruiz & Brescovit, 2017. The Colombian species herein addressed, except for *M. blades*, present an unnoticeable crista. According to the Nopinae hypothesis proposed by Sánchez-Ruiz & Brescovit (2018), the crista, gladius and arolium seem to be membranous leg structures that could appear and disappear more easily than other structures.

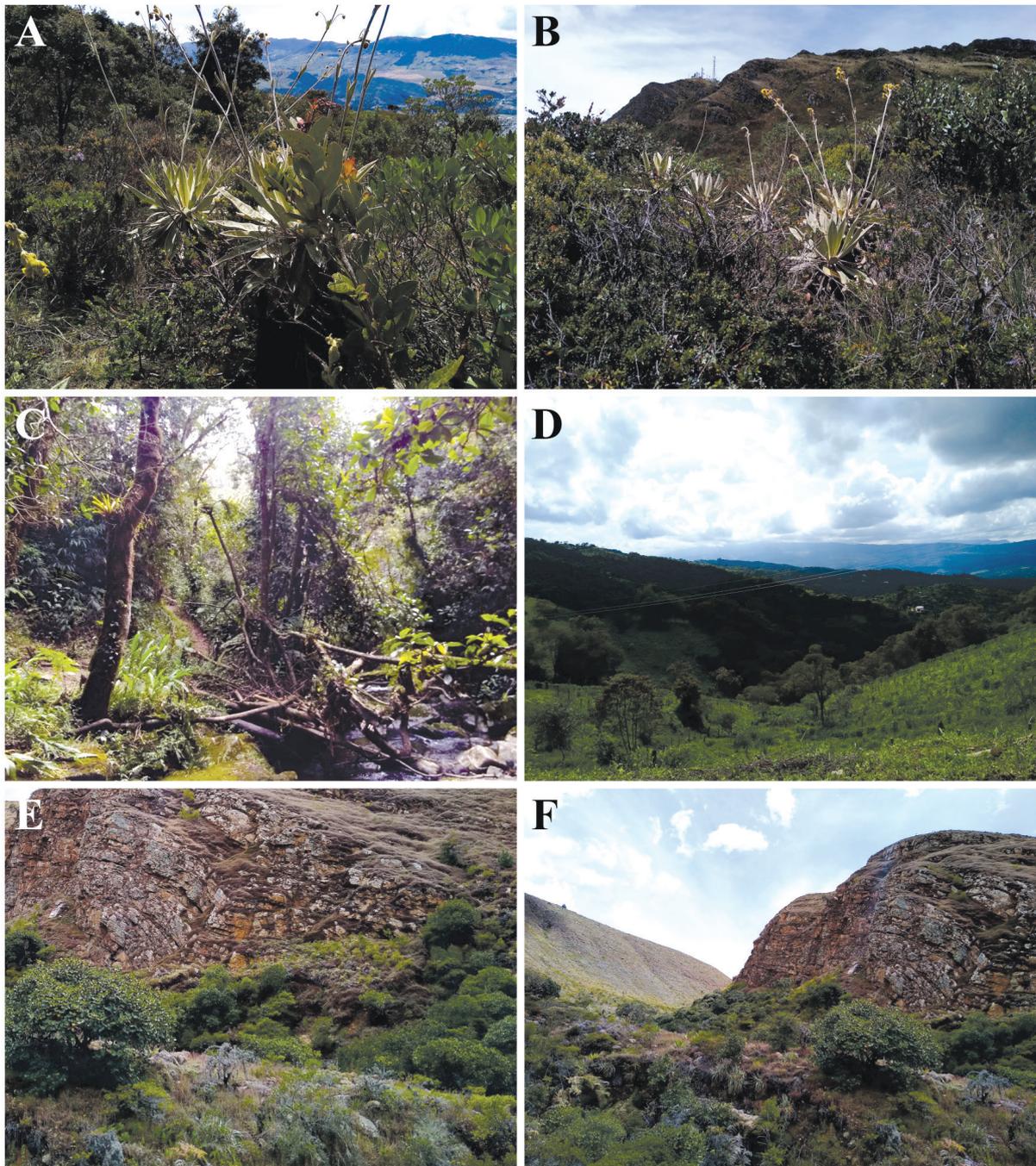


Fig. 8. Habitats of Colombian species of *Medionops* Sánchez-Ruiz & Brescovit, 2017. **A–B.** Type locality of *M. blades* Sánchez-Ruiz & Brescovit, 2017, Páramo de Monserrate, Cundimarca department, Colombia. **C–D.** Type locality of *M. carolinae* sp. nov., Sutamarchán, Boyacá department, Colombia. **E–F.** Habitat of female paratype (IAvH-I 3771) of *M. carolinae* sp. nov., Sector Carrizal, Santuario de Flora y Fauna Iguaque, Boyacá department, Colombia.

Although the presence and shape of these membranous structures may vary interspecifically in *Medionops*, intraspecific variation is not common in the genus. As far as we know, detectable morphological variation between populations is present only in *M. blades*, specifically in the male palpal morphology and the female external genitalia. The populations from Boyacá department have the embolus tip somewhat more curved than those from Cundinamarca department, where the holotype comes from. In females, the area under the genital opening is narrower and more sclerotized in the populations from Boyacá than in those from Cundinamarca department, but the internal receptaculum is very similar in both populations.

On the other hand, *M. blades* appears to be close to *M. carolinae* sp. nov. and *M. cesari* (Dupérré, 2014). The males of these three species have a similar copulatory bulb shape with an oval tegulum and an elongated embolus curved at the tip. However, these species are distinguished by some diagnostic characteristics that suggest a close relationship between the members of *M. carolinae* sp. nov. and *M. cesari*. Both species have the tegulum $\frac{1}{3}$ as long as the cymbium length (larger in *M. blades*) and an accentuated curvature at the embolus tip (straighter in *M. blades*). However, the morphology of the emboli tips, both in *M. carolinae* sp. nov. and in the two known populations of *M. blades*, is quite similar. In that regard, the several blade-shaped embolar projections, which were diagnostic for members of *M. blades*, are also present in *M. carolinae* sp. nov.

Considering the variations of both known populations of *M. blades* and their similarities with *M. carolinae* sp. nov. and *M. cesari*, the hypothesis that *M. blades* represents a complex of closely related species cannot be dismissed with the available evidence. We hope soon to be able to obtain more specimens from other localities from Colombia and Ecuador to test this hypothesis with both molecular and additional morphological studies.

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