

ISSN 1759-0116 (Online)

# ZooNova

## Occasional Papers in Zoology

Number 29, Pages 1 – 22

**AN INORDINATE FONDNESS FOR SPINNERETS: ON SOME SPIDERS OF  
THE GENERA *DIPLURA* C. L. KOCH, 1850 AND *LINOTHELE* KARSCH,  
1879 WITH NEW SPECIES, RECORDS, AND NOTES ON TYPES  
(ARANEAE: DIPLURIDAE)**

Danniella Sherwood, Bastian Drolshagen, Luis M. Osorio,  
Léiner Benavides & Michael Seiter

Published on-line at <https://zoonova.afriherp.org>

Afriherp Communications, Greenford, United Kingdom

Date of publication: 23 November 2023

Copyright: Danniella Sherwood, Bastian Drolshagen, Luis M. Osorio,  
Léiner Benavides & Michael Seiter 2023

*Digital copies are archived in <https://zenodo.org> and the British Legal Deposit Libraries  
(The British Library; National Library of Scotland; National Library of Wales; Bodleian  
Library, Oxford; University Library, Cambridge and the Library of Trinity College, Dublin)*

**An inordinate fondness for spinnerets: on some spiders of the genera *Diplura* C. L. Koch, 1850 and *Linothele* Karsch, 1879 with new species, records, and notes on types (Araneae: Dipluridae)**

**LSID: [zoobank.org:pub:E3EBBD99-C9AF-4692-B142-D5167B2E2804](https://zoobank.org/pub:E3EBBD99-C9AF-4692-B142-D5167B2E2804)**

**Danniella Sherwood<sup>1,2,\*</sup>, Bastian Drolshagen<sup>3</sup>, Luis M. Osorio<sup>4</sup>, Léiner Benavides<sup>5</sup> & Michael Seiter<sup>6,7</sup>**

<sup>1</sup> Arachnology Research Association, London, United Kingdom

<sup>2</sup> Fundación Ariguanabo, San Antonio de los Baños, Cuba

<sup>3</sup> Karlsruhe, Germany

<sup>4</sup> Semillero de investigación Artrópodos del Caribe Colombiano “NEOPTERA”. Universidad del Atlántico, Barranquilla, Colombia.

<sup>5</sup> Grupo de Investigación en Insectos Neotropicales. Universidad del Magdalena, Santa Marta Colombia.

<sup>6</sup> Naturhistorisches Museum Wien, Vienna, Austria

<sup>7</sup> Department of Evolutionary Biology, Unit Integrative Zoology, University of Vienna, Vienna, Austria

\* Corresponding author: [danni.sherwood@hotmail.com](mailto:danni.sherwood@hotmail.com)

#### **ABSTRACT**

During recent routine curatorial work in the Natural History Museum, London three additional specimens, two of *Diplura nigra* (F. O. Pickard-Cambridge, 1896) and one of *D. sanguinea* (F. O. Pickard-Cambridge, 1896) – previously not known to have been separated from the original respective type samples according the museum database – were located in a box of returned material from an external loan. Thus, the number of paralectotypes of these taxa must be revised. We also record *D. sanguinea* from Colombia for the first time, further expanding the distribution range of this widespread taxon. Knowledge of the linothelid taxa of Colombia is advanced, with description of *Linothele gaboi* **sp. nov.** and *Linothele wiwa* **sp. nov.**, and the first Colombian distribution records of *L. curvitaris* Karsch, 1879. Additionally, we also describe two new species from Peru: *L. abispa* **sp. nov.** and *L. wallacei* **sp. nov.** *Linothele melloleitaoi* (Brignoli, 1983), from Colombia, is considered a **nomen dubium**.

#### **KEY WORDS**

curatorship, museum, diplurid, Brazil, Colombia, new species

#### **INTRODUCTION**

The family Dipluridae Simon, 1889 presently contains seven genera: *Diplura* C. L. Koch, 1850, *Harmonicon* F. O. Pickard-Cambridge, 1896, *Linothele* Karsch, 1879, *Masteria* L. Koch, 1873, *Siremata* Passanha & Brescovit, 2018, *Striamea* Raven, 1981, and *Trechona* C. L. Koch, 1850 (World Spider Catalog 2023). Recent work has advanced the taxonomy of this group (e.g. Brescovit *et al.* 2021; Sherwood 2022; Bäckstam *et al.* 2023; Dupérré *et al.* 2023) but much remains to be resolved for historical species and the number of undescribed species is likely to remain high.

In this work, we discuss recently rediscovered paralectotypes of two Brazilian *Diplura* which were recently revised (Brescovit *et al.* 2021) and newly record *Diplura sanguinea* (F. O. Pickard-Cambridge, 1896) from Colombia. We advance the knowledge of Colombian *Linothele* through the description of new species and report the first distribution records of *L. curvitaris* in this country. Furthermore, we describe *Linothele abispa* **sp. nov.**, and *Linothele wallacei* **sp. nov.** from Peru. Finally, we address an enigmatic Colombian species, rendering it a *nomen dubium*.

## MATERIAL AND METHODS

Specimens were examined under binocular microscopes. Photographs of habitus and genitalia for non-Colombian specimens were made by DS using a Canon EOS 6D Mark II attached to a Leica MZ12.5 with images stacked using Helicon Focus software; those for Colombian specimens were mostly made by LO with a Leica S8AP0 stereoscope and LAS V3.4.0 software, except for the habitus of the rediscovered paralectotypes of *D. sanguinea*, made by DS using an Olympus TG-6, and the habitus and genitalia of the Meta, Colombia *D. sanguinea* specimen, made by BD using a Fujifilm X-E1. Abbreviations: BMNH = Natural History Museum, London, United Kingdom; CAUA = Colección de Artrópodos de la Universidad del Atlántico, Colombia; coll. = collected by; D = ventral median depression; don. = donated by; ICN = Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia; imm. = immature; MACN = Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina; MNHN = Muséum National d'Histoire Naturelle, Paris, France; NHMW = Naturhistorisches Museum Wien, Vienna, Austria. Maps were made using SimpleMappr (Shorthouse, 2010).

## RESULTS

### Taxonomy

#### *Diplura nigra* (F. O. Pickard-Cambridge, 1896)

(Fig. 1)

*Melodeus niger* F. O. Pickard-Cambridge, 1896: 759, pl. 33, figs. 2, 5.

*Thalerothele nigra*: Petrunkevitch 1911: 91.

*Thalerothele nigra*: Mello-Leitão 1923: 102, fig. 12.

*Diplura nigra*: Raven 1985: 74.

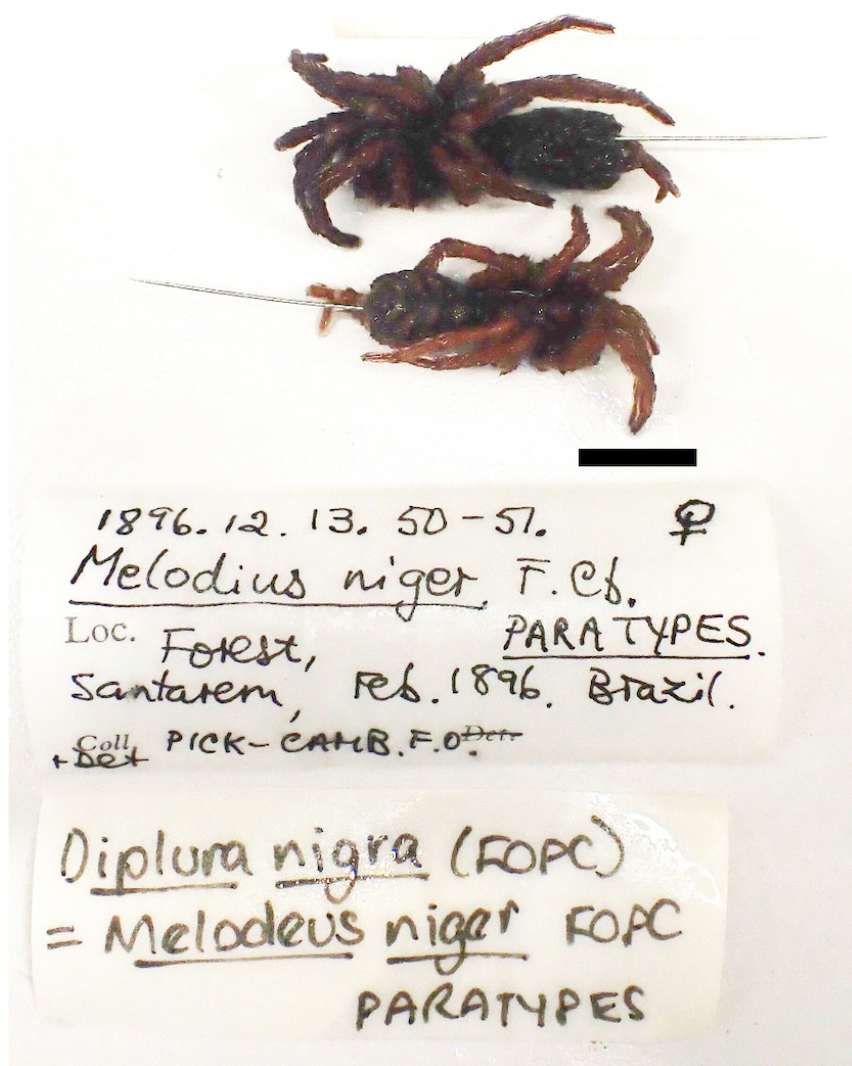
*Diplura nigra*: Brescovit *et al.* 2021: 684, figs. 2A–E, 3B–D, 9A–G, 10A–D, 11A–F, 12A–D.

**Type material:** Lectotype ♀ (BMNH 1896.12.13.49), [designated by Brescovit *et al.* (2021)] Santarém, Pará, Brazil, II/1896, coll. F. O. Pickard-Cambridge, examined; paralectotype 2 imm. ♀ (BMNH 1896.12.13.50–57), [same data, recently rediscovered in collections], examined; paralectotypes 14 imm. (BMNH 1896.12.13.52–58), [same data, designated by Brescovit *et al.* (2021)], examined.

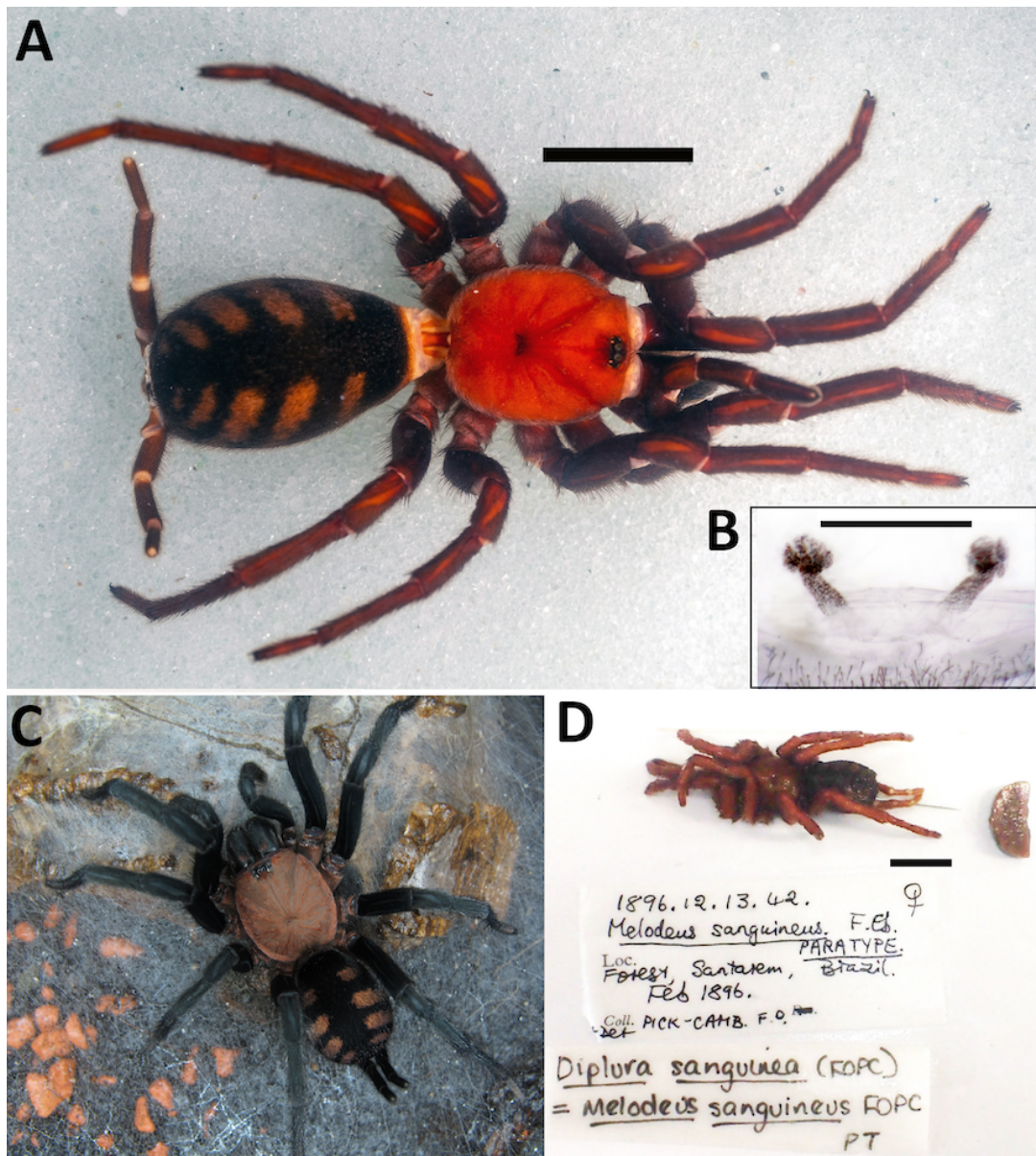
**Diagnosis:** See Brescovit *et al.* (2021).

**Distribution:** Brazil.

**Remarks:** During curatorial work reincorporating returned loans into the main collections of the Natural History Museum, London in December 2022, the senior author located two specimens of *D. nigra* and one of *D. sanguinea* (see below) returned from an external loan. These specimens contained label data indicating they were from the original type series of these taxa, but given no note was placed in the original jars, the existence of these additional specimens was not previously known when lectotypes and paralectotypes of these taxa were designated by Brescovit *et al.* (2021). For *D. nigra*, the two immature females (Fig. 1) revises the total number of specimens in the original type series to 17. This has no effect on the lectotype designation of Brescovit *et al.* (2021). One of the rediscovered paralectotypes has the epigastric area dissected but it is not present with the sample, the other paralectotype immature female is undissected.



**Fig. 1:** *Diplura nigra* (F. O. Pickard-Cambridge, 1896) rediscovered immature female paralectotypes. Scale bar = 10mm.



**Fig. 2:** *Diplura sanguinea* (F. O. Pickard-Cambridge, 1896), **A** habitus and **B** spermataecae of specimen from Meta, Colombia (NHMW), **C** same specimen *in vivo*, **D** rediscovered adult female paralectotype. Scale bars = 10mm (D), 5mm (A), 1mm (B).

***Diplura sanguinea* (F. O. Pickard-Cambridge, 1896)**

(Figs. 2–3)

*Melodeus sanguineus* F. O. Pickard-Cambridge, 1896: 758, pl. 33, figs. 1, 4, 7, pl. 35, figs. 1.

*Thalerothele sanguinea*: Simon 1903: 963.

*Thalerothele sanguinea*: Mello-Leitão 1923: 104, figs. 11.

*Diplura sanguinea*: Raven 1985: 74.

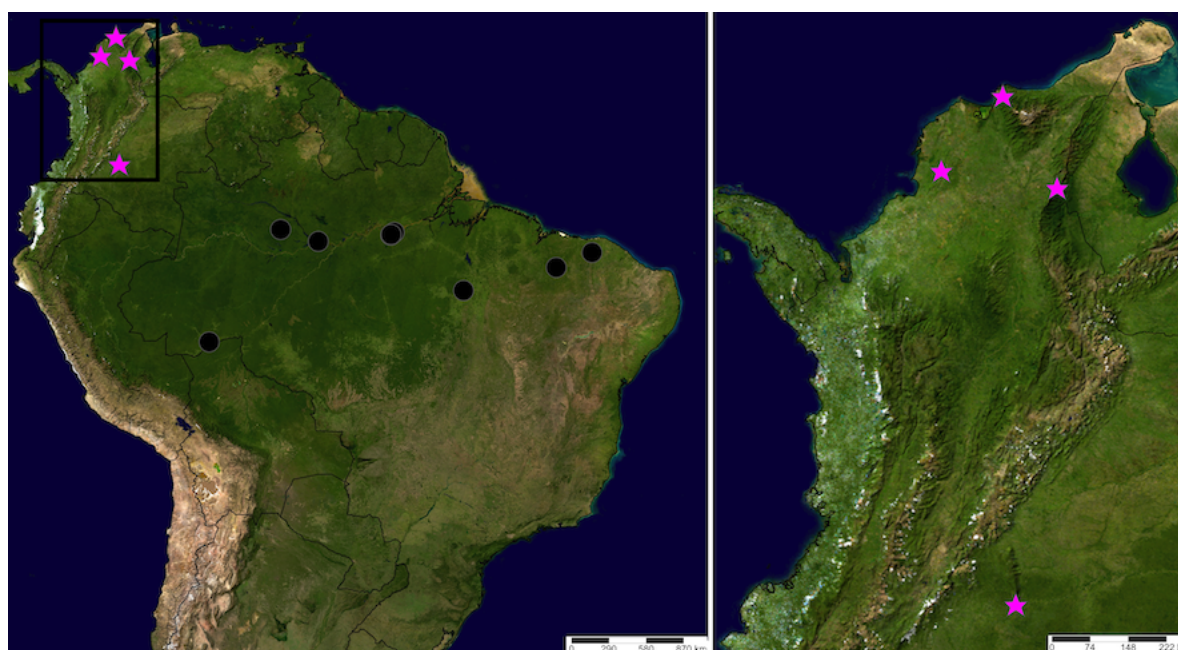
*Diplura sanguinea*: Brescovit *et al.* 2021: 682, figs. 1A–E, 3A, 4A–G, 5A–D, 6A–F, 7A–D, 8A–D.

**Type material:** Lectotype ♀ (BMNH 1896.12.13.41), Santarém, Pará, Brazil, II/1896, coll. F. O. Pickard-Cambridge, examined; paralectotype ♀ (BMNH 1896.12.13.42), [same data, newly rediscovered in collections], examined; paralectotypes 9 imm. (BMNH 1896.12.13.43–48), [same data], examined.

**Diagnosis:** See Brescovit *et al.* (2021).

**Other material examined:** COLOMBIA: 2 ♀♀ (CAUA-Ara052), Bolívar department, San Jacinto, Vda. La Flecha, ground hand collecting, 9°51'00.0"N 75°10'32.0"W, 324 m a.s.l, 10 Nov 2019, coll. L. Osorio; 1 ♀ (CAUA-Ara100), Magdalena department, Sierra Nevada de Santa Marta, Loc. Minca, ground hand collecting, 11°09'06.8"N 74°06'17.4"W, 809 m a.s.l; 16 Oct 2019, coll. L. Osorio; 2 ♀♀ (CAUA-Ara077), Cesar department, La Jagua de Ibirico, Vda. La Victoria, Loc. Nueva Granada, ground hand collecting, 9°33'10.95"N 73°09'34.28"W, 1097 m a.s.l., 05 Jun 2021, coll. L. Osorio & S. García; 1 ♀ (NHMW, no collection number), Río Guayabero, Macarena, Meta, Colombia, 2°17'40.6"N 73°52'44.5"W, 260m, January 2014, coll. M. Seiter.

**Distribution:** Brazil and Colombia (new record) (Fig. 3).

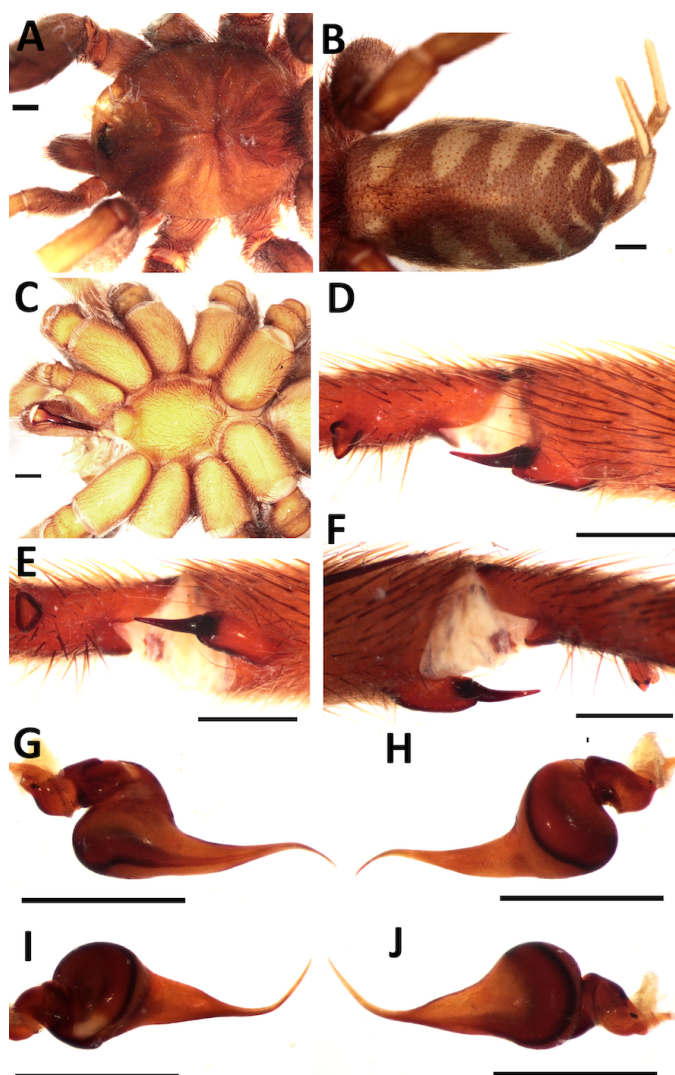


**Fig. 3:** Distribution of *Diplura sanguinea* (F. O. Pickard-Cambridge, 1896), black circles = previous specimens examined by Brescovit *et al.* (2021), pink stars = new localities.

**Remarks:** We verified Colombian material based on examination of the genitalia and the colouration (orange carapace with black opisthosoma adorned with orange stripes laterally) (Figs. 2A–C). Discovery of an additional undissected paralectotype adult female (Fig. 2D) revises the total number of specimens in the original type series to 11. This has no effect on the lectotype designation of Brescovit *et al.* (2021).

This species has a wide distribution across many ecoregions in Brazil (Brescovit *et al.*, 2021). Recently, we noticed records on the citizen science website iNaturalist which showed

diplurids in Colombia with opisthosomal patterning and other somatic characteristics which matched with *D. sanguinea*, suggesting this species may be distributed outside Brazil. Fortunately, MS collected an adult female diplurid specimen in Meta, Colombia (Figs. 2A–C) with near-identical opisthosomal patterning, which was subsequently examined first by BD and then by DS. The female is unquestionably *D. sanguinea*, agreeing with the genitalic and opisthosomal characters for this species as diagnosed by Brescovit *et al.* (2021). Further museum specimens were collected by LO (see Other material examined) and confirmed an even wider Colombian distribution. Thus, we could subsequently confirm the presence of this species in Colombia based on direct examination of collected material.



**Fig. 4:** *Linothele abispa* Sherwood, Drolshagen, Osorio, Benavides & Seiter **sp. nov.** holotype male (BMNH 1905.3.31.149–152), **A** carapace, dorsal view, **B** opisthosoma, dorsal view, **C** labium, sternum and maxilla, ventral view, **D** tibial megaspine and metatarsal protuberance, retrolateral view, **E** same, retro-ventral view, **F** same, prolateral view, **G** palp bulb (left hand side), prolateral view, **H** same, retrolateral view, **I** same, dorsal view, **J** same, ventral view. Scale bars = 1mm.

***Linothele abispa* Sherwood, Drolshagen, Osorio, Benavides & Seiter sp. nov.**

(Figs. 4–5, 11)

**LSID:** [zoobank.org:act:FAA60832-2C7A-4B4A-AC5D-705614252A7D](https://zoobank.org/act:FAA60832-2C7A-4B4A-AC5D-705614252A7D)

**Type material:** Holotype ♂ (BMNH 1905.3.31.149), paratypes 3 ♂♂ (BMNH 1905.3.31.150–152), Oconoque, Carabaya, Peru, 7000ft [= ~2133 m]; paratypes 1 ♂, 1 ♀ (BMNH 1903.7.1.140–142), Marcapata Valley, Peru, [don. W. F. H. Rosenberg].

**Diagnosis:** *Linothele abispa* sp. nov. most closely resembles *Linothele fallax* (Mello-Leitão, 1926) based on the opisthosomal pattern (Figs. 4A, 5A) but can be differentiated by the male embolus being less than twice as long as the base of the palpal bulb (Figs. 4G–J) (embolus more than twice as long as base of palpal bulb in *L. fallax*, see Drolshagen & Bäckstam 2021: 174, figs. 7A–B), the shorter MP (Figs. 4D–F) (MP elongate in *L. fallax*, see Drolshagen & Bäckstam 2021: 174, figs. 7C–D) and by each opposing side of the female spermathecae with two receptacles, essentially equidistant in length (Figs. 5E–F) (each opposing side with two receptacles, outer receptacle much shorter than inner receptacle in *L. fallax*, see Drolshagen & Bäckstam 2021: 174, fig. 7G).

**Etymology:** The specific epithet is a noun in apposition and is derived from the Cusco Quechan word *abispa* which means wasp, in reference to alternate black banding pattern of the opisthosoma.

**Description of holotype male:** Total length including chelicerae: 17.5. Carapace: length 7.5, width 6.7. Caput: slightly raised. Ocular tubercle: raised, length 0.7, width 1.4. Eyes: AME > ALE, ALE > PLE, PLE > PME, anterior eye row slightly procurved, posterior row recurved (Fig. 4A). Clypeus: narrow; clypeal fringe: medium. Fovea: deep slightly recurved. Chelicera: length 1.8, width 1.0. Abdomen: length 8.2, width 4.2. Maxilla with 20–25 cuspules covering approximately 23% of the proximal edge. Labium: length 0.7, width 0.9, lacking cuspules. Labio-sternal mounds: separate. Sternum: length 2.8, width 2.6, with three pairs of sigilla (Fig. 4C). Pseudoscopulae: undivided on tarsi I–II, divided by line of setae on tarsi III–IV. Metatarsal pseudoscopulae: I 53%; II 27%; III 17%; IV ascopulate. Preening combs: absent. Lengths of legs and palpal segments: see table 1, legs 4,1,2,3. Spination: femur I d5, II d5, III d9, IV d10, palp d4, tibia I d3, v5, II d2, v6, III d4, v6, IV d4, v7, palp v2, p5, metatarsus I d1, v2, II d2, v7, III d8, v8, IV d9, v8. Tibia I with single retrolateral megaspine (Figs. 4D–F). Femur III: slightly incrassate. Palpal tibia: unmodified. Palpal cymbium: unmodified. Metatarsus I: metatarsal protuberance present and situated ventrally, triangular when viewed ventrally, with two asymmetrical apical points (Figs. 4D–F). PLS with three segments, basal 1.9, median 1.6, digitiform apical 2.1, rigid. PMS with one segment. Palpal bulb with embolus short, developed retrolateral curve at apex, D absent (Figs. 4G–J). Colour: overall alcohol preserved brown, carapace darker than legs, opisthosoma with alternate black bands across dorsal face (Figs. 4A–C).



**Table 1: *Linothele abispa* Sherwood, Drolshagen, Osorio, Benavides & Seiter sp. nov. holotype male (BMNH 1905.3.31.149–152), podomere lengths.**

	I	II	III	IV	Palp
Femur	7.6	7.4	6.6	8.3	4.6
Patella	3.6	3.5	2.6	3.0	2.1
Tibia	7.2	6.3	4.8	7.0	3.3
Metatarsus	6.6	6.9	7.3	9.5	–
Tarsus	4.5	4.9	3.6	4.0	1.0
Total	29.5	29.0	24.9	31.8	11.0

**Description of paratype female:** Total length including chelicerae: 22.5. Carapace: length 9.5, width 9.0. Caput: slightly raised. Ocular tubercle: raised, length 0.9, width 1.8. Eyes: AME > ALE, ALE > PLE, PLE > PME, anterior eye row procurved, posterior row recurved (Fig. 5A). Clypeus: narrow; clypeal fringe: medium. Fovea: deep recurved. Chelicera: length 3.8, width 2.1. Abdomen: length 9.2, width 4.4. Maxilla with 25 cuspules covering approximately 22% of the proximal edge. Labium: length 0.9, width 1.1, without cuspules. Labio-sternal mounds: separate. Sternum: length 3.3, width 3.6, with three pairs of sigilla (Fig. 5C). Pseudoscopula: undivided on tarsi I–II, divided by line of setae on tarsi III–IV. Metatarsal pseudoscopulae: I 97%; II 61%; III 28%; IV ascopulate. Preening combs: absent. Lengths of legs and palpal segments: see table 2, legs 4,1,2,3. Spination: femur II d1, III d5, IV d4, palp d1, patella palp v1, p1, tibia I v3, II v3, III d4, v4, IV d4, v4, palp v3, p5, metatarsus I v5, II v5, III d5, v5, IV d8, v9. PLS with three segments, basal 2.8, median 2.4, digitiform apical 2.9, rigid. PMS with one segment. Spermathecae: with two receptacles, each with two vesicles essentially equidistant in length, each vesicle bearing a single indistinct lobe (Figs. 5E–F). Colour: as in male, but chelicerae darker than carapace (Figs. 5A–D).

**Distribution:** Carabaya and Marpacata valleys, Peru (Fig. 11).

**Table 2: *Linothele abispa* Sherwood, Drolshagen, Osorio, Benavides & Seiter sp. nov. paratype female (BMNH 1903.7.1.140–142), podomere lengths.**

	I	II	III	IV	Palp
Femur	7.8	7.7	6.6	8.3	4.9
Patella	3.9	3.5	3.2	3.9	2.7
Tibia	6.7	5.4	4.9	6.8	3.9
Metatarsus	5.7	5.6	6.6	9.3	–
Tarsus	5.1	4.3	4.0	5.0	3.5
Total	29.2	26.5	25.3	33.3	15.0

***Linothele curvitorsis* Karsch, 1879**

(Figs. 6, 11)

*Linothele curvitorsus* Karsch, 1879: 546.

*Diplura soricina* Simon, 1889: 189.

*Linothele soricina*: Dupérré & Tapia 2021: 268, figs. 9A–D, 10A–B, 11A–D.

*Linothele curvitorsis*: Drolshagen & Bäckstam 2021: 171, figs. 3A, 5A–B, 6A–I, 17A–E, 19A–B.

**Type material:** Holotype imm. *Linothele curvitorsus* (ZMB Arach-458), Caracas, Venezuela, coll. Golmer, examined; separate preparation of tarsal claw (ZMB Arach-458a), [same data, dissected from holotype], examined; lectotype ♂, paralectotypes 4 ♀♀, 2 imm. *Diplura soricina* (MNHN AR-339), Caracas, Colonie Tovar and San Esteban, Venezuela, coll. E. Simon, examined.

**Diagnosis:** see Drolshagen & Bäckstam (2021).

**Other material examined:** COLOMBIA: 1 ♀ (CAUA\_Ar079) Cesar department, Becerril, Vda. Estados Unidos, ground hand collecting, forest edge, 11°06'18.2"N 74°03'31.8"W, 2511m a.s.l., 11–13 Apr 2022; coll. L. Osorio; 1 imm. (CAUA\_Ar095) Cesar department, La Jagua de Ibirico, Vda. La Victoria, Loc. Nueva Granada, ground hand collecting, 9°33'10.95"N 73°09'34.28"W, 1097 m a.s.l., 08–10 Apr 2022, coll. L. Osorio & S. García; 4 ♀♀ (CAUA\_Ar096) Cesar department, La Jagua de Ibirico, Vda. La Victoria, Loc. Nueva Granada, ground hand collecting, 9°33'10.95"N 73°09'34.28"W, 1097 m a.s.l., 05 Jun 2021, coll. L. Osorio.

**Distribution:** Colombia (new record) and Venezuela (Fig. 11).

**Remarks:** Recent material collected by LO enables us to record *L. curvitorsis* from Colombia for the first time (Figs. 6A–F).

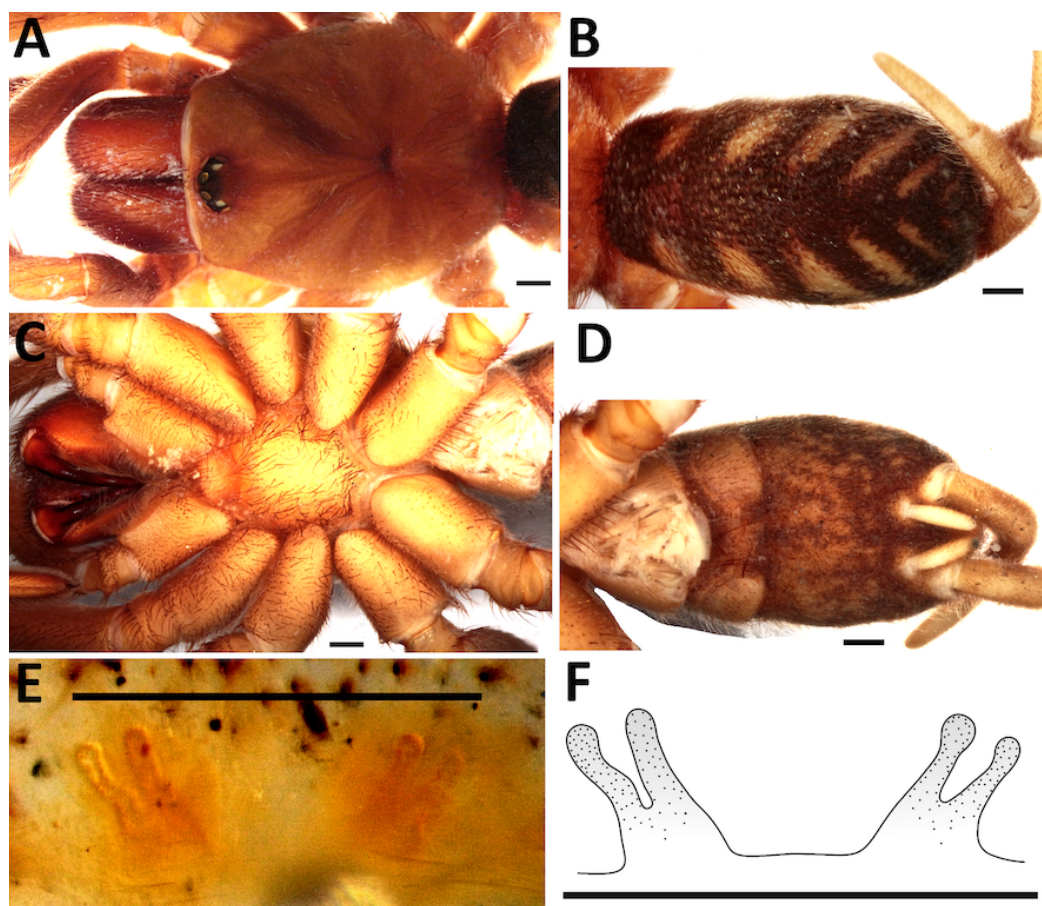
***Linothele gaboi* Osorio, Benavides, Sherwood, Drolshagen & Seiter sp. nov.**

(Figs. 7, 11)

**LSID:**[zoobank.org:act:A22931C8-D64B-4CBE-B0E9-5663AC4B2BED](https://zoobank.org/act:A22931C8-D64B-4CBE-B0E9-5663AC4B2BED)

**Type material:** Holotype ♀ (ICN-Ar 12982), Magdalena department, San Lorenzo, Colombia (11°06'17.3"N 74°03'31.2"W), ground hand collecting, 2800 m a.s.l., 25–28 Mar 2022, coll. L. Osorio & L. Beneavides; paratype ♀ (ICN-Ar 12983), [same data]; paratypes 2 ♀♀, 4 imm. (ICN-Ar 12984), [same data].

**Diagnosis:** *Linothele gaboi* sp. nov. can be distinguished from all other known female congeners by the basally fused area of the spermathecae apically bifurcate and without two disjunct and distinct receptacles (Fig. 7F) (spermathecae with two disjunct and distinct receptacles, without basally fused area, nor apically bifurcate, in all other known female congeners).



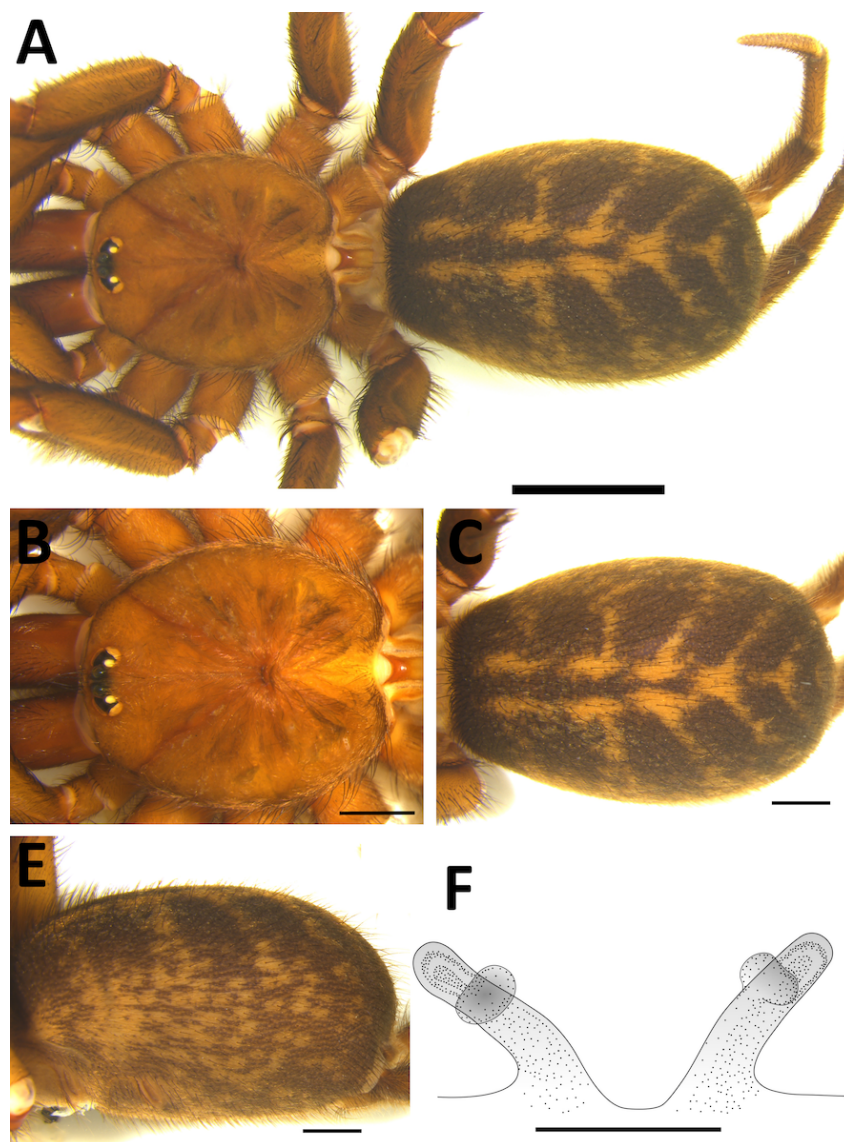
**Fig. 5:** *Linothele abispa* Sherwood, Drolshagen, Osorio, Benavides & Seiter **sp. nov.** paratype female (BMNH 1903.7.1.140–142), **A** carapace, dorsal view, **B** opisthosoma, dorsal view, **C** labium, sternum and maxilla, ventral view, **D** opisthosoma, ventral view, **E** spermathecae, dorsal view, **F** illustration of spermathecae, dorsal view. Scale bars = 1mm.

**Etymology:** The specific epithet is a patronym in honour of Gabriel García Márquez, affectionately known as Gabo, author of the book *Cien años de soledad*, and to his iconic yellow butterflies that resemble the dorsal pattern present on the opisthosoma of this species.

**Description of holotype female:** Total length including chelicerae: 16.7. Carapace: length 5.7, width 5.1. Caput: slightly raised. Ocular tubercle: raised, length 1.5, width 1.0. Eyes: ALE > AME, ALE > PLE, PLE > PME, anterior eye row slightly procurved, posterior row recurved (Fig. 7A). Clypeus: narrow; clypeal fringe: medium. Fovea: deep recurved. Chelicera: length 1.9, width 1.2. Abdomen: length 9.0, width 6.0. Maxilla with 13–16 cuspules covering approximately 17% of the proximal edge. Labium: length 1.1, width 0.8, lacking cuspules. Labio-sternal mounds: separate. Sternum: length 2.8, width 2.9, with three pairs of sigilla (Fig. 7C). Pseudoscopula: tarsi I–IV and metatarsi I–IV with very weakly developed pseudoscopulae, almost indiscernible (e.g. Fig. 7E). Preening combs: absent. Lengths of legs and palpal segments: see table 3, legs 4,1,3,2. Spination: femur I d5, II d4, III d4, IV d3, palp d6, patella I r1, II p1, III p2, r2, v4, IV p1, r1, palp p2, tibia I p1, v4, II p2, r2, v4, III p2, r2, v4, IV p2, r3, v6, palp p1, v2, metatarsus I v6, II p1, v7, III d5, p3, v7, IV p6, r4, v8. Femur III: not incrassate. PLS with three segments, basal 1.6, median 2.0, apical 2.1,

flexible. PMS with one segment. Spermathecae: with broad, high base, apically bifurcate, with two short, medially fused vesicles emerging laterally, each vesicle with a single rounded, laterally projecting lobe (Fig. 7F). Coloration in alcohol: Prosoma, chelicerae, pedipalps and legs pale yellow. Anterior and lateral border of prosoma black, medially with a dorsal pattern consisting of two parallel black stripes extending posteriorly from the middle of the cephalic region, dark brown opisthosoma with a distinct pattern in the mid-dorsal part consisting of pale-yellow spots that may merge medially giving an appearance similar to butterfly wings, laterally with several spots; ventrally with longitudinal lines and spots; maculae on legs present (Figs. 7A–D).

**Distribution:** Known only from type locality, San Lorenzo, Magdalena, Colombia (Fig. 11).



**Fig. 6:** *Linothele curvitaris* Karsch, 1879, non-type female from Colombia (CAUA\_Ar096), **A** habitus, dorsal view, **B** carapace, dorsal view, **C** opisthosoma, dorsal view, **D** opisthosoma, lateral view, **E** spermathecae, dorsal view, **F** illustration of spermathecae, dorsal view. Scale bars = 5mm (A), 2mm (B–D), 0.5mm (E–F).

**Table 3:** *Linothele gaboi* Osorio, Benavides, Sherwood, Drolshagen & Seiter sp. nov. holotype female (ICN-Ar 12982), podomere lengths.

	I	II	III	IV	Palp
Total	15.5	13.6	14.6	19.0	9.0
Femur	4.2	4.1	3.9	5.4	3.0
Tibia	3.1	2.7	2.7	4.1	2.3
Tarsus	2.6	1.9	2.4	3.1	2.3
Patella	2.3	2.1	1.5	1.4	1.4
Metatarsus	3.3	2.8	4.1	5.0	–

***Linothele melloleitaoi* (Brignoli, 1983) nomen dubium***Diplura maculata* Mello-Leitão, 1941: 236 (preoccupied nomen).*Diplura melloleitaoi* Brignoli, 1983: 124 (replacement name).**Type material:** Holotype ♀ (MNRJ), Cúcuta, Santander, Colombia, lost in fire (World Spider Catalog 2023).

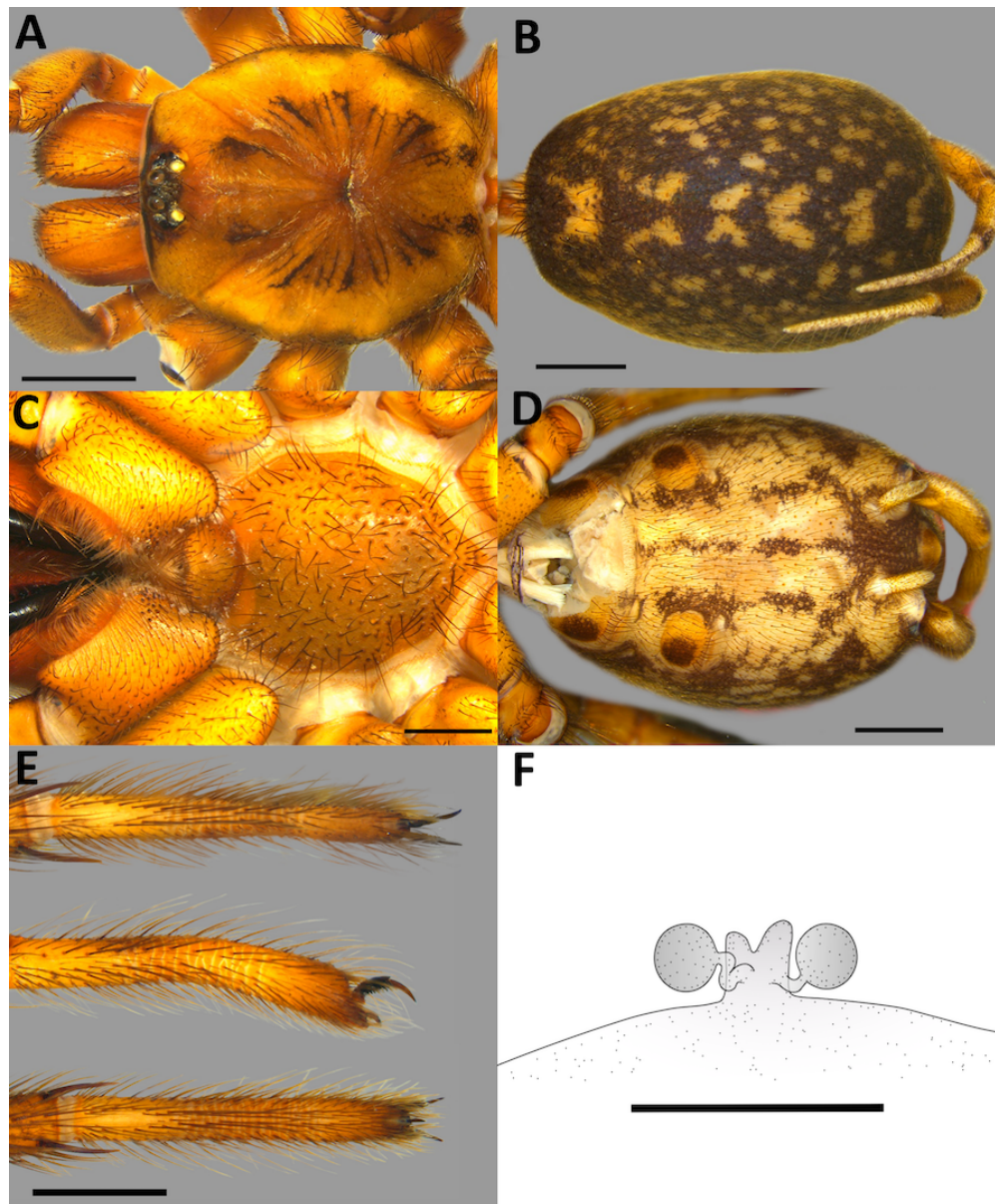
**Remarks:** The species was described, based on a single supposed female specimen, as *Diplura maculata* by Mello-Leitão (1941), who mentioned it to be a rather small specimen (13 mm body length) with flexible leg tarsi, leg segments with maculae, and an opisthosomal pattern common among many species of *Linothele*. As the type is lost, Drolshagen & Bäckstam (2021) referred to the description and stated the species mostly resembled *Linothele quori* Dupérré & Tapia, 2015, but might be distinguished from it by the flexible leg tarsi (vs. only few medial cracks in *L. quori*), the absence of a ventral pattern, and its distribution. The state of leg tarsi segmentation and the ventral markings of the opisthosoma are known to vary during the ontogeny of many species. This leaves one character to distinguish *L. melloleitaoi* from other species in the area: the presence of maculae, another character found to vary during the ontogeny of some species. Considering the specimen described by Mello-Leitão (1941) is probably immature, based on body length, the description thus does not state any valuable characters to securely distinguish the species from congeners. Therefore, based on all of the above argumentation, we hereby propose *Linothele melloleitaoi* as a **nomen dubium**.

***Linothele wallacei* Sherwood, Drolshagen, Osorio, Benavides & Seiter sp. nov.**

(Figs. 8, 11)

**LSID:** [zoobank.org:act:B8D2CA02-B6EA-4F20-AC94-6B52A3BB1A0E](https://zoobank.org/act:B8D2CA02-B6EA-4F20-AC94-6B52A3BB1A0E)**Type material:** Holotype ♂, (BMNH 1900.5.10.41), Eten, Peru, coll. P. O. Simons.**Diagnosis:** *Linothele wallacei* sp. nov. most closely resembles *L. spinosa* in general palpal bulb morphology but differs by the more tapered and thinner apex of the embolus (Figs. 8G–

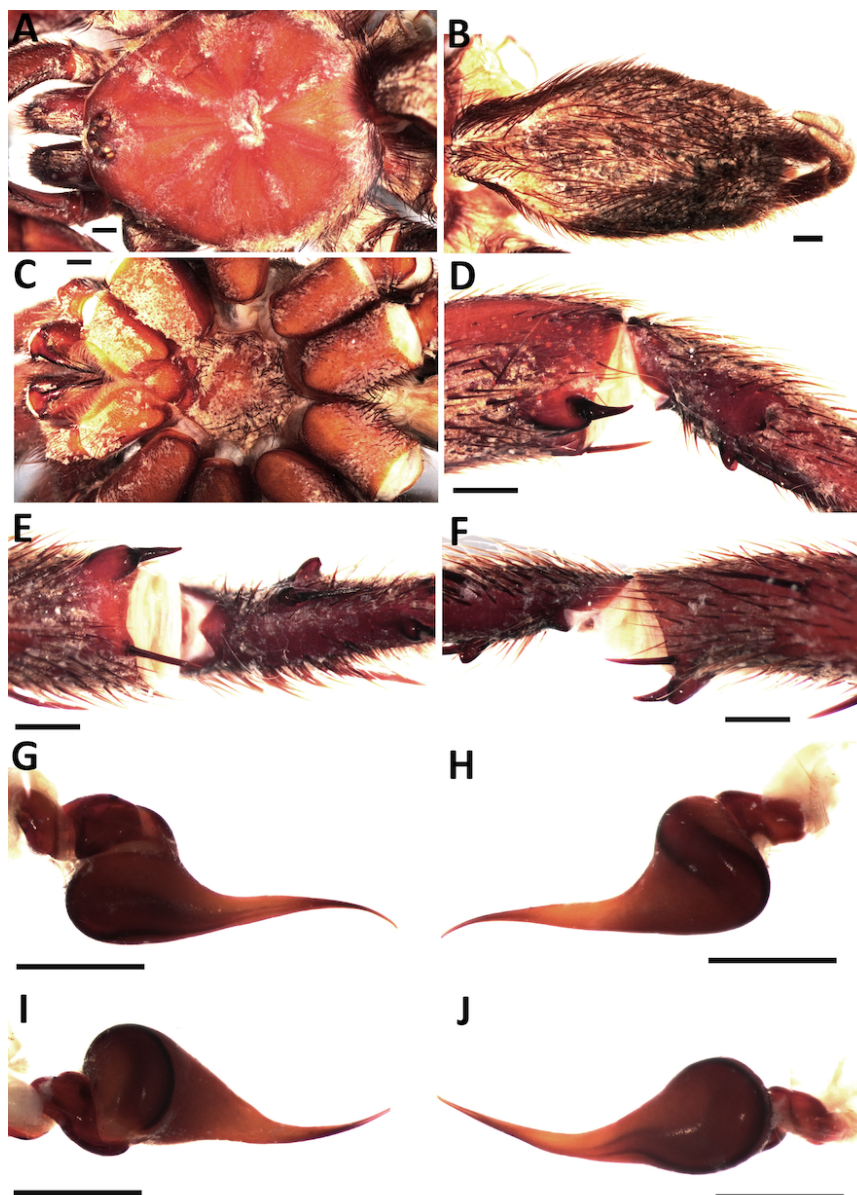
J) (embolus comparatively wider and less tapered in *L. spinosa*, see Drolshagen & Bäckstam 2021: 174, figs. 15A–B) and the developed MP (Figs. 8D–F) (MP weakly developed in *L. spinosa*, see Drolshagen & Bäckstam 2021: 174, fig. 15G).



**Fig. 7:** *Linothele gaboi* Osorio, Benavides, Sherwood, Drolshagen & Seiter **sp. nov.** holotype female (ICN-Ar 12982), **A** carapace, dorsal view, **B** opisthosoma, dorsal view, **C** labium, sternum and maxilla, ventral view, **D** opisthosoma, ventral view, **E** tarsi, showing reduced scopulae, **F** illustration of spermathecae, dorsal view. Scale bars = 2mm (A, B, D), 1mm (C, E), 0.5mm (F).

**Etymology:** The specific epithet is a patronym in honour of the co-discoverer of evolution by natural selection, Alfred Russel Wallace (1823–1913), on the occasion of the bicentenary year of his birth. Wallace led a fascinating life, making contributions to many fields of science and also to social justice, including women’s suffrage. The senior author spent nine months in 2020 during the pandemic employed as a project coordinator and researcher for the Alfred

Russel Wallace Correspondence Project – transcribing Wallace’s interesting correspondence was a great constant during that time of global uncertainty.



**Fig. 8:** *Linothele wallacei* Sherwood, Drolshagen, Osorio, Benavides & Seiter **sp. nov.** holotype male (BMNH 1900.5.10.41), **A** carapace, dorsal view, **B** opisthosoma, dorsal view, **C** labium, sternum and maxilla, ventral view, **D** tibial megaspine and metatarsal protuberance, retrolateral view, **E** same, ventral view, **F** same, prolateral view, **G** palpal bulb (left hand side), prolateral view, **H** same, retrolateral view, **I** same, dorsal view, **J** same, ventral view. Scale bars = 1mm.

**Description of holotype male:** Total length including chelicerae: 25.7. Carapace: length 11.3, width 9.7. Caput: slightly raised. Ocular tubercle: raised, length 1.2, width 1.9. Eyes: AME > ALE, ALE > PLE, PLE > PME, anterior eye row slightly procurved, posterior row recurved (Fig. 8A). Clypeus: narrow; clypeal fringe: medium. Fovea: deep recurved. Chelicera: length 3.4, width 1.7. Abdomen: length 11.0, width 4.8. Maxilla with 30–35

cuspules covering approximately 23% of the proximal edge. Labium: length 1.2, width 1.5, lacking cuspules. Labio-sternal mounds: separate. Sternum: length 3.9, width 4.2, with three pairs of sigilla (Fig. 8C). Pseudoscopula: undivided on tarsi I–II, divided by line of setae on tarsi III–IV. Metatarsal pseudoscopulae: I 52%; II 46%; III 35%; IV ascopulate. Preening combs: present. Lengths of legs and palpal segments: see table 4, legs 4,1,2,3. Spination: femur I d7, II d5, III d8, IV d12, palp d4, patella II p1, III p2, tibia I v3, II v6, III d2, v7, IV d5, v7, palp p8, r4, metatarsus I d3, v7, II v7, III d10, v10, IV d6, v7. Tibia I with single retrolateral megaspine (Figs. 8D–F). Femur III: slightly incrassate. Palpal tibia: unmodified. Palpal cymbium: unmodified. Metatarsus I: metatarsal protuberance present, situated laterally, almost triangular with single apex (Figs. 8D–F). PLS with three segments, not measured due to fragility. PMS with one segment. Palpal bulb with embolus of moderate length, with weakly developed retrolateral curve at apex, D absent (Figs. 8G–J). Colour: overall alcohol-preserved brown, abdomen sunken in from prior desiccation without signs of opisthosomal pattern [although this may be an artefact of preservation] (Figs. 8A–C).

**Distribution:** Known only from the type locality, Eten, Peru (Fig. 11).

Remarks: An immature *Linothele* specimen is also present in the tube with the holotype. Whilst it is probably conspecific with the male, we hereby explicitly state it is a non-type specimen and exclude it from type status.

**Table 4:** *Linothele wallacei* Sherwood, Drolshagen, Osorio, Benavides & Seiter sp. nov. holotype male (BMNH 1900.5.10.41), podomere lengths.

	I	II	III	IV	Palp
Femur	10.2	9.8	9.3	10.9	6.5
Patella	5.7	5.0	4.0	4.6	2.8
Tibia	8.8	7.8	6.7	8.4	5.3
Metatarsus	9.4	9.0	9.9	13.7	–
Tarsus	7.8	6.6	5.8	7.3	1.9
Total	41.9	38.2	35.7	44.9	16.5

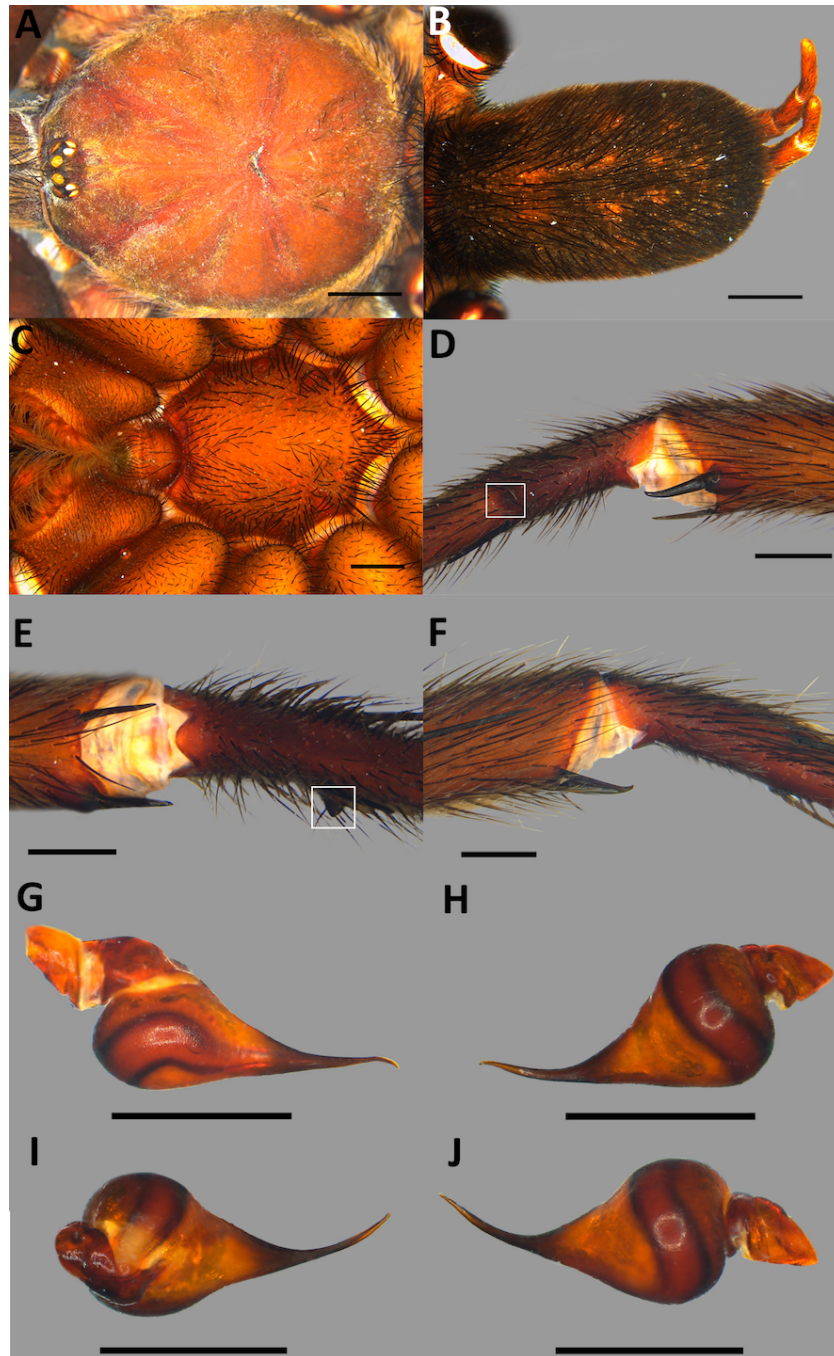
***Linothele wiwa* Osorio, Benavides, Sherwood, Drolshagen & Seiter sp. nov.**

(Figs. 9–11)

**LSID:** [zoobank.org/act:F1D53A99-9049-460F-8164-DCC4223781AB](https://zoobank.org/act:F1D53A99-9049-460F-8164-DCC4223781AB)

**Type material:** Holotype ♂ (ICN-Ar 12985), Cesar department, Becerril, Vda. Estados Unidos, Colombia (9°35'51.2"N, 73°09'46.7"W), ground hand collecting, 591 m a.s.l, 8–13 Apr 2022, coll. L. Osorio & S. García; paratype ♀ (ICN-Ar 12986), [same data]; paratype ♀ (ICN-Ar 12987), La Jagua de Ibirico, Vda. La Victoria, Nueva Granada, Colombia (9°35'51.2"N, 73°09'46.7"W), ground hand collecting, 810 m a.s.l, 8–13 Apr 2022, L. Osorio & S. García.

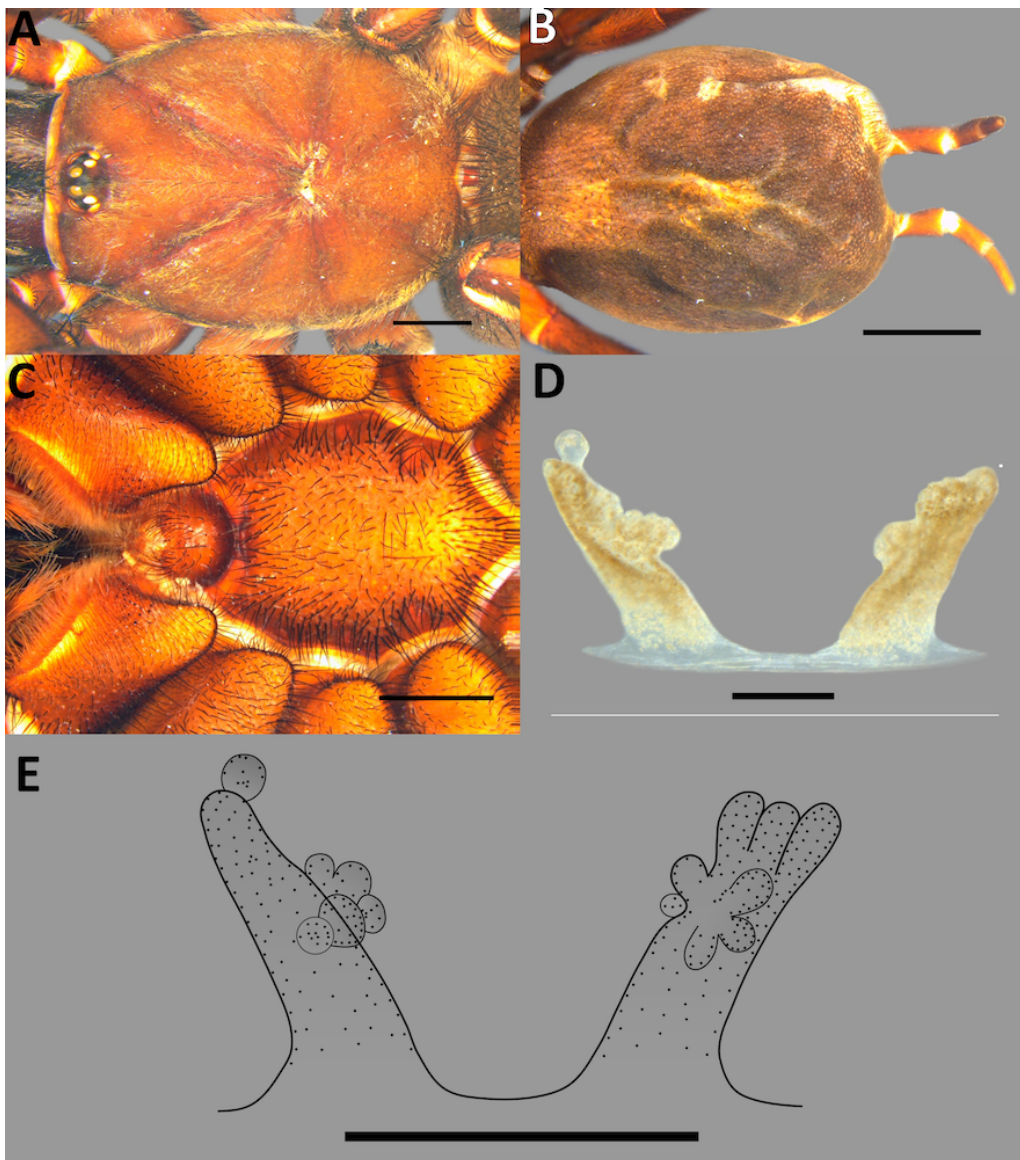




**Fig. 9:** *Linothele wiwa* Osorio, Benavides, Sherwood, Drolshagen & Seiter **sp. nov.** holotype male (ICN-Ar 12985), **A** carapace, dorsal view, **B** opisthosoma, dorsal view, **C** labium, sternum and maxilla, ventral view, **D** tibial megaspine and metatarsal protuberance, retrolateral view, **E** same, ventral view, **F** same, prolateral view, **G** palpal bulb (left hand side), prolateral view, **H** same, retrolateral view, **I** same, dorsal view, **J** same, ventral view. Scale bars = 2mm (A–B), 1mm (C–J). Metatarsal protuberance indicated with white square due to darkness of structure and leg segment.

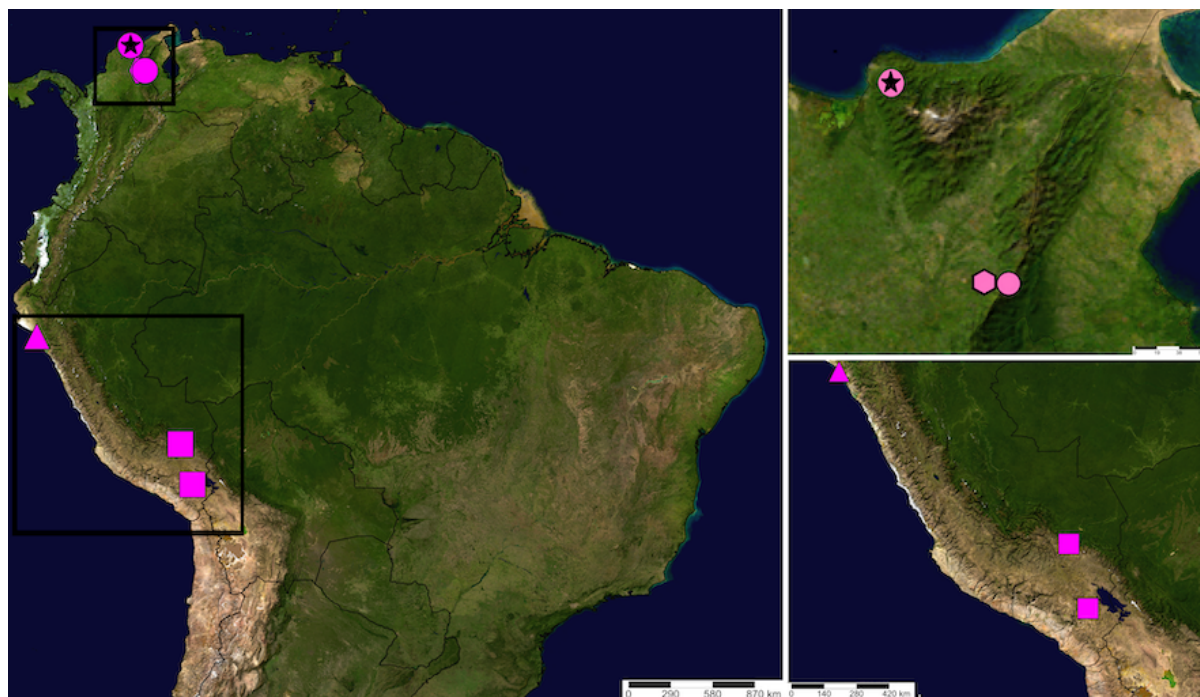
**Diagnosis:** *Linothele wiwa* **sp. nov.** can be distinguished from all other known male congeners by the short embolus, its total length equal to or slightly less than the length of the

base of the bulb (Figs. 9G–J) (embolus always noticeably longer than base of bulb in all other known congeners e.g. Drolshagen & Bäckstam 2021; Sherwood 2022; this work). The female of *L. wiwa* **sp. nov.** most closely resembles *L. agelenoides*, *L. gaujoni* and *L. uniformis* by the wide spermathecal receptacles with multiple lobes on the necks of the respective receptacles, but can be distinguished by the presence of lobes on the prolateral face (Figs. 10D–E) (lobes only present apically in *L. agelenoides* see Bäckstam *et al.*, 2023: 7, fig.1D–E and *L. gaujoni*, see Dupérré *et al.*, 2023: 262, fig. 162D–G; and lobes present only apically and retrolaterally in *L. uniformis*, see Drolshagen & Bäckstam, 2021: 187, fig. 16D).



**Fig. 10:** *Linothele wiwa* Osorio, Benavides, Sherwood, Drolshagen & Seiter **sp. nov.** paratype female (ICN-Ar 12986), **A** carapace, dorsal view, **B** opisthosoma, dorsal view, **C** labium, sternum and maxilla, ventral view, **D** spermathecae, dorsal view, **E** illustration of spermathecae, dorsal view. Scale bars = 2mm (A, C), 5mm (B), 0.5mm (E), 0.2mm (D).

**Etymology:** The specific epithet is a noun in apposition and pays homage to the indigenous Wiwa people, who inhabit the departments of Magdalena, Guajira, and Cesar.



**Fig. 11:** Distribution of new species of *Linothele* Karsch, 1879 in Colombia and Peru described herein (*L. abispa* **sp. nov.**, squares; *L. gaboi* **sp. nov.**, star; *L. wallacei* **sp. nov.**, triangle; *L. wiwa* **sp. nov.**, hexagon), plus localities of the newly-reported specimens of *L. curvitaris* Karsch, 1879 from Colombia (circles).

**Description of holotype male:** Total length including chelicerae: 21.5. Carapace: length 9.9, width 8.2. Caput: slightly raised. Ocular tubercle: raised, length 0.9, width 1.6. Eyes: ALE > AME, AME > PLE, PLE > PME, anterior eye row slightly procurved, posterior row recurved (Fig. 9A). Clypeus: narrow; clypeal fringe: medium. Fovea: deep recurved. Chelicera: length 1.8, width 1.7. Abdomen: length 9.8, width 5.2. Maxilla with 22 cuspules covering approximately 23% of the proximal edge. Labium: length 1.1, width 1.4, lacking cuspules. Labio-sternal mounds: separate. Sternum: length 4.7, width 4.4, with three pairs of sigilla (Fig. 9C). Pseudoscopula: undivided on anterior tarsi, tarsi III and IV divided by a broad line of setae. Metatarsal pseudoscopulae: I 54%; II 47%; III 32%; IV ascopulate. Preening combs: present. Lengths of legs and palpal segments: see table 5, legs 4,1,2,3. Spination: femur I d8, II d10, III d11, IV d9, palp d7, tibia I d3, v4, II d2, v6, III d7, v6 IV d7, v6 palp v4, p1, metatarsus I v5 II d2, v6, III d9, v6 IV d10, v11. Tibia I with single retrolateral megaspine (Figs. 9D–F). Femur III: slightly incrassate. Palpal tibia: unmodified. Palpal cymbium: unmodified. Metatarsus I: metatarsal protuberance present, situated laterally, almost triangular with single apex (Figs. 9D–F). PLS with three segments, basal 2.3, median 1.2, digitiform apical 1.7, rigid. PMS with one segment. Palpal bulb with embolus short, very weakly retrolaterally curved, D absent (Figs. 9G–J). Colour: prosoma, chelicerae, legs and pedipalps dark brown; opisthosoma dark brown, dorsally with pattern consisting of two discontinuous parallel pale-yellow lines (Figs. 9A–C).

**Table 5: *Linothele wiwa* Osorio, Benavides, Sherwood, Drolshagen & Seiter sp. nov. holotype male (ICN-Ar 12985), podomere lengths.**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>Palp</b>	
Femur	8.8	8.4	7.7	9.9	5.0	
Patella	4.7	4.5	3.7	4.0	2.7	
Tibia	7.1	6.6	5.5	7.1	4.4	
Metatarsus	7.9	8.7	8.6	10.3	–	
Tarsus	6.6	5.9	5.5	5.6	1.8	
Total	35.1	34.1	31.0	36.9	13.9	

**Description of paratype female:** Total length including chelicerae: 29.5. Carapace: length 10.4, width 9.3. Caput: slightly raised. Ocular tubercle: raised, length 1.3, width 1.7. Eyes: ALE > AME, AME > PLE, PLE > PME, anterior eye row procurved, posterior row recurved (Fig. 10A). Clypeus: narrow; clypeal fringe: medium. Fovea: deep recurved. Chelicera: length 2.8, width 2.4. Abdomen: length 16.2, width 8.6. Maxilla with 20 cuspules covering approximately 21% of the proximal edge. Labium: length 1.3, width 1.8, without cuspules. Labio-sternal mounds: separate. Sternum: length 5.3, width 4.8, with three pairs of sigilla (Fig. 10C). Pseudoscopula: undivided on anterior tarsi, tarsi III and IV divided by a broad line of setae. Metatarsal pseudoscopulae: I 80%; II 91%; III 68%; IV ascopulate. Preening combs: present. Lengths of legs and palpal segments: see table 6, legs 4,1,2,3. Spination: femur I d3, II d2, III d5, IV d4, palp d3, tibia I d2, v3, II d2, v2, III d5, v6, IV d3, v2 palp v5, p3, metatarsus I v6, II v6 III d7, v5 IV d7, v8. PLS with three segments, basal 2.3, median 1.5, digitiform apical 2.1, rigid. PMS with one segment. Spermathecae: with two receptacles, each bearing multiple vesicles from medial to apical portion of the prolateral face, lobes distinct or indistinct (Figs. 10D–E). Colour: prosoma, chelicerae, legs, pedipalps and opisthosoma dark brown; opisthosoma without an evident dorsal pattern (Figs. 10A–C).

**Distribution:** Serranía del Perijá, Cesar, Colombia (Fig. 11).

**Table 6: *Linothele wiwa* Osorio, Benavides, Sherwood, Drolshagen & Seiter sp. nov. paratype female (ICN-Ar 12986), podomere lengths.**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>Palp</b>	
Femur	8.3	7.9	6.4	9.0	5.7	
Patella	4.7	4.6	3.8	4.3	3.4	
Tibia	6.5	5.9	5.0	6.9	3.8	
Metatarsus	6.4	6.5	5.6	8.7	–	
Tarsus	5.0	4.4	3.6	4.9	3.8	
Total	30.9	29.3	24.4	33.8	16.7	

## DISCUSSION

The present contribution adds a further four new species to the genus *Linothele*. We also remove one dubious Colombian species of this genus. Whilst this genus has received much attention in the last few years (Dupérré & Tapia 2015, 2021; Drolshagen & Bäckstam 2021; Sherwood 2022; Nicoletta *et al.* 2022; Peñaherrera-R. *et al.* (2023); Bäckstam *et al.* 2023; Dupérré *et al.* 2023), other diplurine genera (except *Trechona*) are in need of more thorough modern revisions. Most importantly, work to clarify the identities of historically described *Harmonicon* and *Diplura* species which have not yet been revised using modern methods is a priority. For the latter, only a handful of works have been written in the last eight years, addressing the taxonomy of only a few old and novel taxa (Bäckstam 2015; Pedroso *et al.*, 2016, 2018; Brescovit *et al.*, 2021; Dupérré & Tapia, 2021) with many historical taxa yet awaiting redescription. For the former, a description of the adults of both sexes of the type species *H. rufescens* F. O. Pickard-Cambridge, 1896 (see above) and a redescription of *H. audeae* Maréchal & Marty, 1998 are required, and further new species are likely to be described (DS pers. obs.).

## ACKNOWLEDGEMENTS

We would like to thank Jan Beccaloni (BMNH), William Galvis (ICN), Christine Rollard and Elise-Anne Leguin (MNHN), Christoph Hörweg (NHMW), and Jason Dunlop and Anja Friederichs (ZMB) for access to material in these respective collections. DS also thanks George Beccaloni (Alfred Russel Wallace Correspondence Project) for commenting on the etymology for the species dedicated to Alfred Russel Wallace. MS is most grateful to Javier Alejandro Maldonado-Ocampo (Museo Javeriano de Historia Natural Lorenzo Uribe, Bogotá) and Oliver Lucanus (McGill University, Montreal, Canada) for their logistic support and help with collecting permissions during the field trip in Colombia. We thank Christian Bäckstam and an anonymous reviewer for their very thoughtful comments which improved this work, and Andrew Whittington (Pentrefoelas, Wales) for his diligent editing.

## REFERENCES

- Bäckstam, C. M. 2015.** Complementary taxonomic data on the Bolivian spider *Diplura erlandi* (Tullgren, 1905) with emphasis on complications with the male lectotype (Araneae: Dipluridae: Diplurinae). *Arachnology*, 16(7): 255–259.
- Bäckstam, C. M., Drolshagen, B. & Seiter, M. 2023.** *Linothele agelenoides* sp. n., a new species of *Linothele* Karsch, 1879 (Araneae, Dipluridae) from central Colombia. *Annalen des Naturhistorischen Museums in Wien, Serie B*, 125: 5–12.
- Brescovit, A. D., Sherwood, D. & Lucas, S. M. 2021.** First description of the males of *Diplura sanguinea* (F. O. Pickard-Cambridge, 1896) and *Diplura nigra* (F. O. Pickard-Cambridge, 1896) from Brazilian Amazonia, with notes on biogeography and opisthosomal patterning (Araneae: Dipluridae). *Arachnology*, 18(7): 681–689.
- Brignoli, P. M. 1983.** *A catalogue of the Araneae described between 1940 and 1981*. Manchester University Press, 755 pp.
- Drolshagen, B. & Bäckstam, C. M. 2021.** A taxonomic review of the mygalomorph spider genus *Linothele* Karsch, 1879 (Araneae, Dipluridae). *Zoosystema*, 43(10): 163–196.
- Dupérré, N. & Tapia, E. 2015.** Descriptions of four kleptoparasitic spiders of the genus *Mysmenopsis* (Araneae, Mysmenidae) and their potential host spider species in the genus *Linothele* (Araneae, Dipluridae) from Ecuador. *Zootaxa*, 3972: 343–386.

- Dupérré, N. & Tapia, E. 2021.** The endless search for type specimens; illustrations of eleven spider (Araneae, Mygalomorphae) species described by Eugène Simon. *Zootaxa*, 4951(2): 259–282.
- Dupérré, N., Tapia, E. & Bond, J. 2023.** Review of the Spider Genus *Linothele* (Mygalomorphae, Dipluridae) from Ecuador — An Exceptional Case of Speciation in the Andes. *Arthropoda*, 1(3): 68–341.
- Karsch, F. 1879.** Arachnologische Beiträge. *Zeitschrift für die gesammten Naturwissenschaften*, 52: 534–562.
- Koch, C. L. 1850.** *Übersicht des Arachnidensystems*. Heft 5. J. L. Lotzbeck, Nürnberg, 77 pp.
- Koch, L. 1873.** Die Arachniden Australiens, nach der Natur beschrieben und abgebildet [Erster Theil, Lieferung 8-9]. Bauer & Raspe, Nürnberg, 369–472, pl. 28–36.
- Maréchal, P. & Marty, C. 1998.** Réhabilitation du genre *Harmonicon* (Pickard-Cambridge, 1896) et description d'une nouvelle espèce de Guyana française (Araneae, Mygalomorphae, Dipluridae). *Zoosystema*, 20: 499–504.
- Mello-Leitão, C. F. de 1923.** Theraphosideas do Brasil. *Revista do Museu Paulista*, 13: 1–438.
- Mello-Leitão, C. F. de 1926.** Algumas Theraphosoides novas do Brasil. *Revista do Museu Paulista*, 14: 307–324.
- Mello-Leitão, C. F. de 1941.** Catalogo das aranhas da Colombia. *Anais da Academia Brasileira de Ciências*, 13: 233–300.
- Nicoletta, M., Ochoa, J. A., Chaparro, J. C. & Ferretti, N. 2022.** A new species of *Linothele* (Araneae: Dipluridae) from Peru. *Zoosystematica Rossica*, 31(1): 134–142.
- Passanha, V. & Brescovit, A. D. 2018.** On the Neotropical spider subfamily Masteriinae (Araneae, Dipluridae). *Zootaxa*, 4463(1): 1–73.
- Pedroso, D. R., Castanheira, P. de S. & Baptista, R. L. C. 2016.** Redescription and synonymies of *Diplura macrura* (C.L. Koch, 1841) and *D. lineata* (Lucas, 1857), with notes on the genus (Araneae, Dipluridae). *European Journal of Taxonomy*, 210: 1–21.
- Pedroso, D. R., Giupponi, A. P. D. L. & Baptista, R. L. C. 2018.** Comments on the genus *Diplura* C. L. Koch, 1850, with description of two new species (Araneae, Mygalomorphae, Dipluridae). *ZooKeys*, 771: 57–71.
- Peñaherrera-R., P., Guerrero-Campoverde, A., Pinos-Sanchez, A. & Cisneros-Heredia, D. F. 2023.** A new species of *Linothele* Karsch, 1879 (Araneae: Dipluridae) from south-eastern Ecuador. *Arachnology*, 19(4): 713–720.
- Petrunkevitch, A. 1911.** A synonymic index-catalogue of spiders of North, Central and South America with all adjacent islands, Greenland, Bermuda, West Indies, Terra del Fuego, Galapagos, etc. *Bulletin of the American Museum of Natural History*, 29: 1–791.
- Pickard-Cambridge, F. O. 1896.** On the Theraphosidae of the lower Amazons: being an account of the new genera and species of this group of spiders discovered during the expedition of the steamship “Faraday” up the river Amazons. *Proceedings of the Zoological Society of London*, 64: 716–766.
- Raven, R. J. 1981.** Three new mygalomorph spiders (Dipluridae, Masteriinae) from Colombia. *Bulletin of the American Museum of Natural History*, 170: 57–63.
- Raven, R. J. 1985.** The spider infraorder Mygalomorphae (Araneae): Cladistics and systematics. *Bulletin of the American Museum of Natural History*, 182: 1–18.

- Sherwood, D. 2022.** First description of the male of *Linothele longicauda* (Ausserer, 1871) and redescription of the male of *Linothele gaujoni* (Simon, 1889) (Araneae: Dipluridae). *Revista Ibérica de Aracnología*, 41: 3–8.
- Shorthouse, D. P. 2010.** *SimpleMappr*, an online tool to produce publication-quality point maps, online at <https://www.simplemappr.net>
- Simon, E. 1889.** Révision des Avicularidae de la République de l'Ecuador. *Actes de la Société Linnéenne de Bordeaux*, 42: 399–404.
- Simon, E. 1903.** *Histoire naturelle des araignées. Deuxième édition, tome second.* Roret, Paris, pp. 669–1080.
- World Spider Catalog 2023.** *World spider catalog, version 24.5.* Bern: Natural History Museum, online at <http://wsc.nmbe.ch>

**Submitted: 18 September 2023**

**Accepted for publication: 22 November 2023**