

## Three new species of *Paratropis* Simon, 1889 (Araneae: Mygalomorphae: Paratropididae) from Brazil and Colombia

Naila Amanda S. Santos<sup>1</sup>, Joao Pedro C. Gomes<sup>1</sup>, Marlus Queiroz Almeida<sup>1</sup>, Jose Wellington de Morais<sup>1</sup> and Rogério Bertani<sup>2</sup>: <sup>1</sup>Instituto Nacional de Pesquisas da Amazônia, Laboratório de Sistemática e Ecologia de Invertebrados do Solo, CEP 690160-001, Av. André Araújo, Manaus, AM, Brazil. E-mail: nailaamanda.s.santos@gmail.com; <sup>2</sup>Instituto Butantan, Laboratório de Ecologia e Evolução, Av. Vital Brazil, 1500 CEP 05503-900, São Paulo, SP, Brazil

**Abstract.** The Paratropididae Simon, 1889 comprises small to medium-sized (6.0–18.5 mm) mygalomorph spiders with 26 species distributed in four genera: *Anisaspis* Simon, 1892; *Anisaspoides* F. O. Pickard-Cambridge, 1896; *Paratropis* Simon, 1889 and *Stormtropis* Perafán, Galvis & Pérez-Miles, 2019. Paratropidids can be found in tropical and mountain forests, in caves, near rivers, under fallen logs and rocks, leaf litter, moss and ravines. Most species are distributed in South America, mainly in Colombia, Ecuador and Brazil. Despite recent efforts in understanding the taxonomy of the family, paratropidids are still poorly studied. Herein, three new species of *Paratropis* are described: *Paratropis celiae* sp. nov. and *Paratropis manauara* sp. nov., both from Manaus in the state of Amazonas, Brazil; and *Paratropis vulcanix* sp. nov. from Departamento Tolima-Calda Nevado del Ruiz, Colombia. An updated geographical distribution map for the entire genus is presented and a discussion on the taxonomic problems of the family is provided.

**Keywords:** Arachnida, biodiversity, taxonomy

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**ZooBank Registration:** <http://zoobank.org/?lsid=urn:lsid:zoobank.org:pub:6C7A0FB7-4FFB-4CB3-98C4-900BCF6130AF>

The family Paratropididae Simon, 1889, comprises 26 described species in four genera: *Anisaspis* Simon, 1892; *Anisaspoides* F. O. Pickard-Cambridge, 1896; *Paratropis* Simon, 1889 and *Stormtropis* Perafán, Galvis & Pérez-Miles, 2019 (World Spider Catalog 2025). *Paratropis* is composed of eighteen species: *P. arenosa* Dupérré & Tapia, 2024, *P. carcosita* Dupérré & Tapia, 2024, *P. cryptica* Dupérré & Tapia, 2024, *P. elicioi* Dupérré, 2015, *P. esmeraldas* Dupérré & Tapia, 2024, *P. florezi* Perafán, Galvis & Pérez-Miles, 2019, *P. kapak* Dupérré & Tapia, 2024, *P. minuscula* Almeida & de Morais, 2022, *P. otonga* Dupérré & Tapia, 2020, *P. papilligera* F. O. Pickard-Cambridge, 1896, *P. paschoa* Dupérré & Tapia, 2024, *P. pristirana* Dupérré & Tapia, 2020, *P. pukallucha* Dupérré & Tapia, 2024, *P. sanguinea* Mello-Leitão, 1923, *P. scruposa* Simon, 1889, *P. seminermis* Caporiacco, 1955, *P. tortue* Sherwood, Lucas & Brescovit, 2023 and *P. tuxtensis* Valdez-Mondragón, Mendoza & Francke, 2014 (World Spider Catalog 2025).

*Paratropis* Simon, 1889, are semi-fossorial spiders, whose biology and ecology are still poorly known (Raven 1999). They are among the most enigmatic of Mygalomorphae due to their cryptic habits, unique biology and controversial phylogenetic position (Bond et al. 2012; Perafán et al. 2019). These visually unusual arachnids coat themselves with a layer of sand or earth (Dupérré & Tapia 2020). They are found in tropical and temperate forests, in caves, in mountainous regions, living in different microhabitats on the forest floor. In the Amazon, they are found foraging in burrows in sloping areas (abandoned termite mounds) and in litter on the forest floor (Raven 1999; Valdez-Mondragón et al. 2014; Dupérré 2015; Perafán et al. 2019; Almeida & Morais 2022).

Herein, we describe three new species of *Paratropis* from Brazil and Colombia, and we present an updated geographical distribution map for the entire genus.

### METHODS

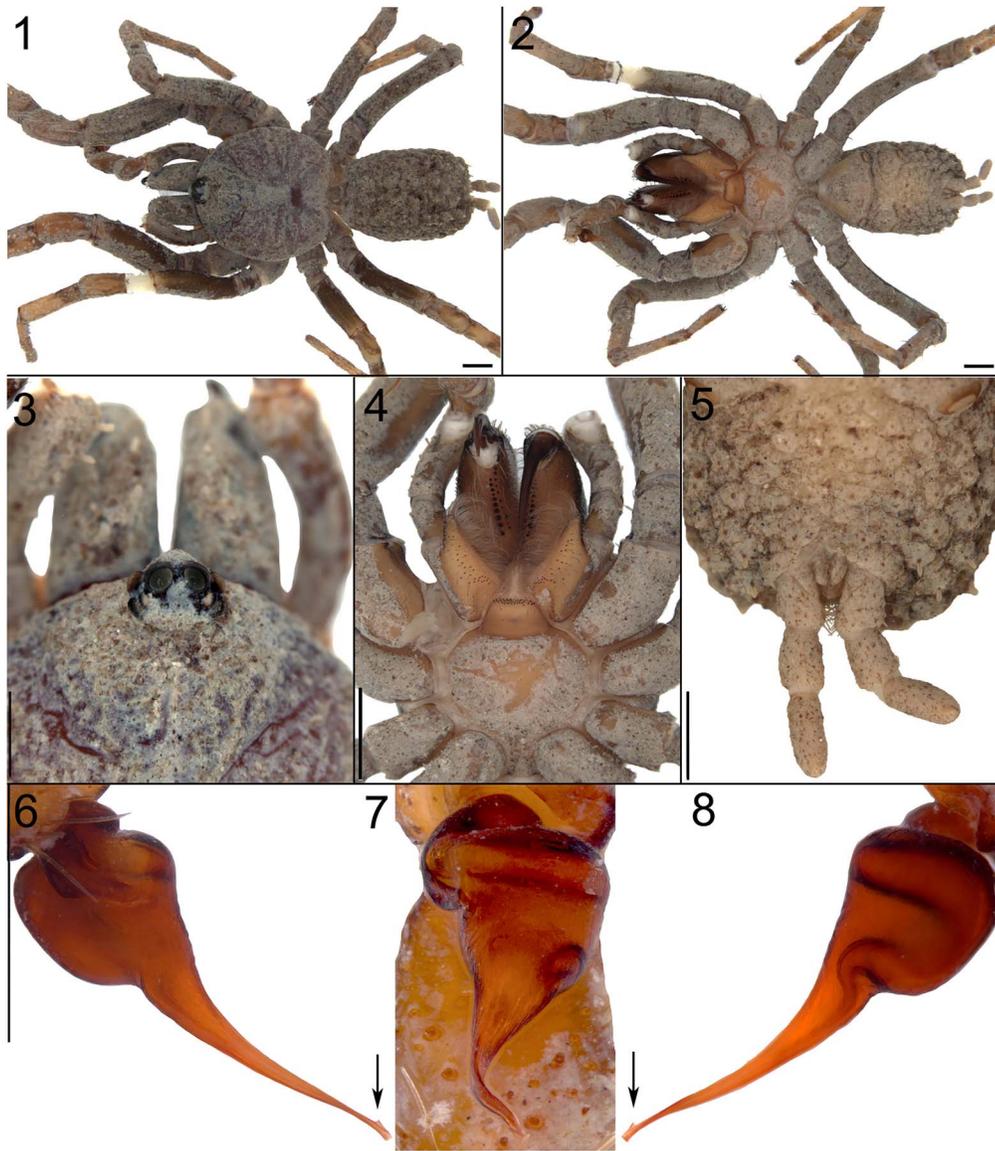
Collections were made in Brazil, in the state of Amazonas, Manaus, Acariquara Ecological Reserve, -3.081221°, -059.958518°, located in a housing condominium area, and at the Universidade

Federal do Amazonas (UFAM), -3.040082°, -059.376535°, a Brazilian public higher education institution.

Specimens were examined in 70% ethanol using a stereomicroscope (Leica M80). All photographs and measurements were taken under a Leica M205A stereomicroscope using the Leica V4.10 application package. Left appendages were measured and used for descriptions and images. Total length was measured with the spider in dorsal view, including the chelicerae. All measurements are in millimeters. After dissection, the female spermathecae were cleared in clove oil (pure) for 30 minutes. For a better visualization, they were then immersed in 85% lactic acid for 5 to 10 min (Cumming 1992). Images of spermathecae were taken using a Leica DFC295 stereomicroscope. Specimens were deposited at the collections of the Museum of Comparative Zoology at Harvard University, New York, USA (MCZ) and at the Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (INPA). Descriptions and terminology follow Raven (1999) with some modifications proposed by Bertani (2013).

The integument of paratropidid spiders is covered with different types of setae, and we note that there has historically been some confusion in descriptions regarding the differentiation of spines and megabristles. We considered spines to be thick and short, with the distal ends not forming a thin point, but rather ending abruptly. The megabristles are intermediate structures between the body setae and spines. They are thicker than the covering setae and longer than spines, ending in a long slender distal portion. Paratropidids are covered in megabristles and have few spines. However, most females and some males have two rows of short spines on the pro and retroventral faces of the anterior tarsi, and sometimes metatarsi. We distinguish the different setae types in the descriptions.

For scanning electron microscope (SEM) imaging, appendages and other body parts were dissected and cleaned (first with a needle and fine brush, then with an ultrasonic cleaner at 20–40 kHz, to remove soil particles embedded on the exoskeleton); subsequently, they were dehydrated using a series of ethanol solutions from 70% to 100% concentration, and finally critical point dried. They were examined under low vacuum in a scanning electron microscope (SEM) and



Figures 1–8.—*Paratropis celiae* sp. nov., holotype male: 1, habitus, dorsal view; 2, habitus, ventral view; 3, ocular tubercle; 4, sternum, labium and maxillae, ventral view; 5, spinnerets, ventral view; 6, left palpal bulb, prolateral view; 7, left palpal bulb, ventral view; 8, left palpal bulb, retrolateral view. Arrow points to the triangular tooth on the subapical region of the embolus. Scale bars: 1 mm.

images were obtained using a Tescan Vega 3 coupled to an energy dispersive X-ray spectroscopy system (EDS; INCA energy, United Kingdom). All scale measurements on SEM photomicrographs are in microns. The map was made with SimpleMapp, version 3.0, OpenAPI (Shorthouse 2010). The photographs and the map were edited in Adobe Photoshop CC 2017.

Geographic coordinates are approximate and were obtained with Google Earth™ and indicated by square brackets.

Abbreviations: ALE, anterior lateral eye; AME, anterior median eye; fe, femur; ITC, inferior tarsal claw; me, metatarsus; p, prolateral; pa, patella; pd, prolatero-dorsal; PME, posterior median eye; PMS, posterior median spinneret; PLE, posterior lateral eye; PLS, posterior lateral spinneret; pv, prolatero-ventral; r, retrolateral; rv, retrolatero-ventral; STC, superior tarsal claw; ta, tarsus; ti, tibia; tr, trichobothria.

## TAXONOMY

### Family Paratropididae Simon, 1889

#### Genus *Paratropis* Simon, 1889

**Type species.**—*Paratropis scruposa* Simon, 1889, by monotypy.

**Diagnosis.**—*Paratropis* can be distinguished from other genera of Paratropididae by the following combination of characters (*sensu* Dupérré & Tapia 2020): narrow cheliceral groove, with teeth on both margins in two juxtaposed rows (Figs. 4, 24); two pairs of spinnerets (PMS and PLS) (Figs. 28, 43, 70, 81); third claw (ITC) on leg I only (except in *P. vulcanix* sp. nov., on which it is present on all legs) (Figs. 33, 48, 62, 73); males without tibial apophysis, and palp bulb with embolus long, thin and straight (except in *P. celiae* sp. nov. which has



Figures 9–12.—*Paratropis celiae* sp. nov., holotype male: 9, left tarsal claws I, retrolateral view; 10, left leg I, tibia, metatarsus and tarsus, dorsal view; 11, left tarsus II, retrolateral view; 12, left leg II, tibia, metatarsus and tarsus, dorsal view (arrow points to ITC present on leg I). Scale bars: 1 mm.

the embolus curved on the retrolateral side) (Figs. 59–61). Females with long spermathecae with or without longitudinal folds (except in *P. vulcanix* sp. nov., which has the spermathecae short and rounded) (Figs. 18, 19, 71, 72).

**Distribution.**—Brazil, Colombia, Ecuador, French Guiana, Mexico, Venezuela, Peru, Guyana (WSC 2025).

*Paratropis celiae* sp. nov.

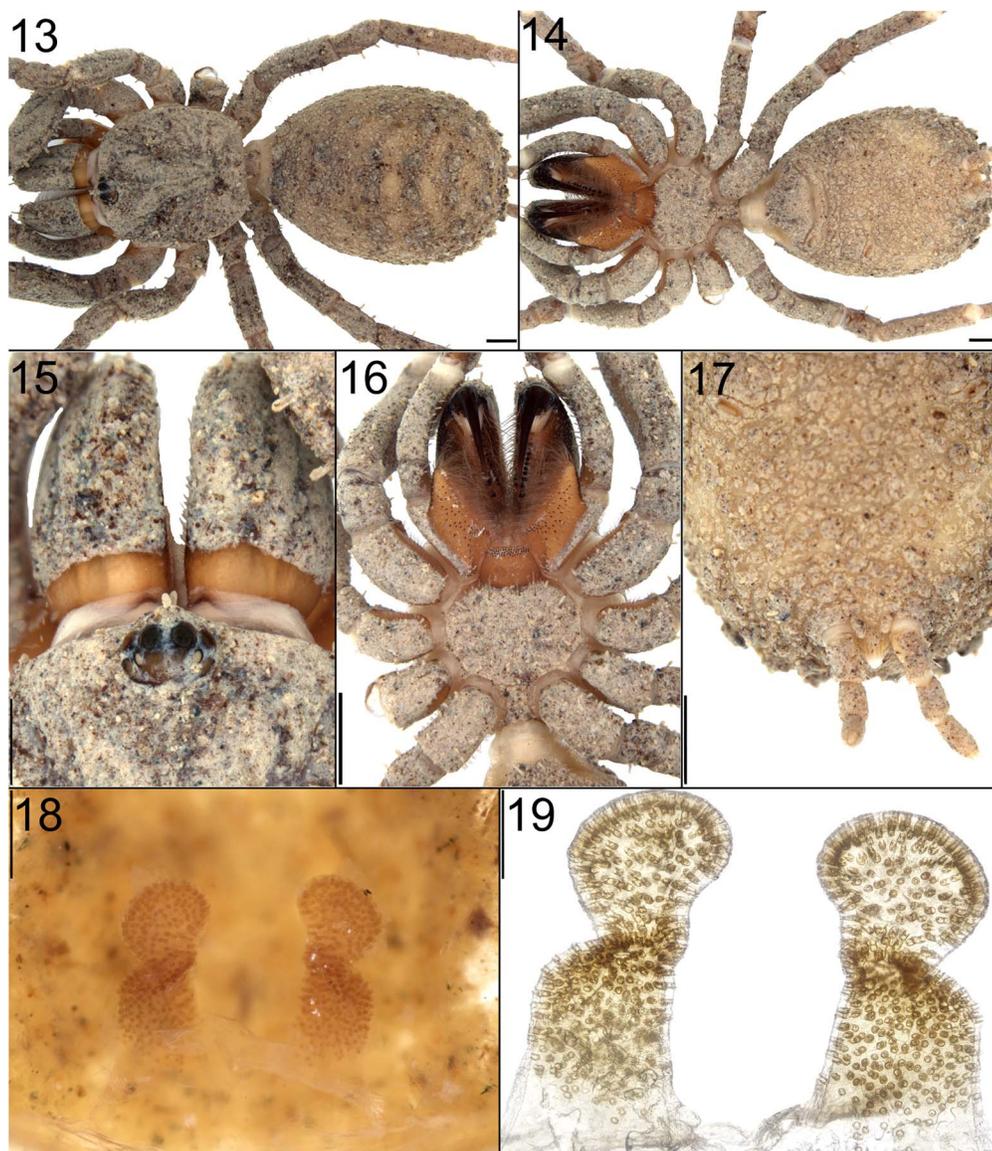
<http://zoobank.org/?lsid=urn:lsid:zoobank.org:act:244E9340-7E05-4DE5-8CD1-E23852D28AFD>  
(Figs. 1–53)

**Type material.**—*Holotype male*. BRAZIL: Amazonas: Manaus, Acariquara, Barranco/Plato, [−3.081221°, −059.958518°], 17 April 2018, M. Almeida (INPA-ARA 9115).

*Paratypes*. BRAZIL: Amazonas: 1 ♀, Manaus, Acariquara, Barranco/Plato, [−3.081221°, −059.958518°], 9 March 2018, M. Almeida (INPA-ARA 9115); 1 ♂, 3 ♀, same data (INPA-ARA 9115).

**Etymology.**—The specific epithet is a matronym in honor of Celia Maria Sousa Ribeiro, mother of the first author, who died in the 2021 COVID-19 pandemic.

**Diagnosis.**—Males of *Paratropis celiae* sp. nov. resemble those of *P. manauara* sp. nov. and *Stormtropis muisca* Perafán, Galvis & Pérez-Miles, 2019 (see Discussion, below) by having a translucent triangular tooth on the subapical region of the embolus in combination with the absence of a tibial apophysis (Figs. 6–8). They can be distinguished from *P. manauara* by their smaller size and the embolus having a curvature to the retrolateral side (Figs. 8, 31); and from *S. muisca* by the embolus narrowing abruptly at its base (Figs. 31, 32). Females resemble those of *P. manauara* sp. nov., *S. paisa* Perafán, Galvis & Pérez-Miles, 2019 (see discussion below), *P. esmeraldas* Dupérré & Tapia, 2024, *P. pukallucha* Dupérré & Tapia, 2024, *P. kapak* Dupérré & Tapia, 2024, *P. carcosita* Dupérré & Tapia, 2024, and *P. pasochoa* Dupérré & Tapia, 2024 by the non-multilobular shape of the spermathecae, but can be

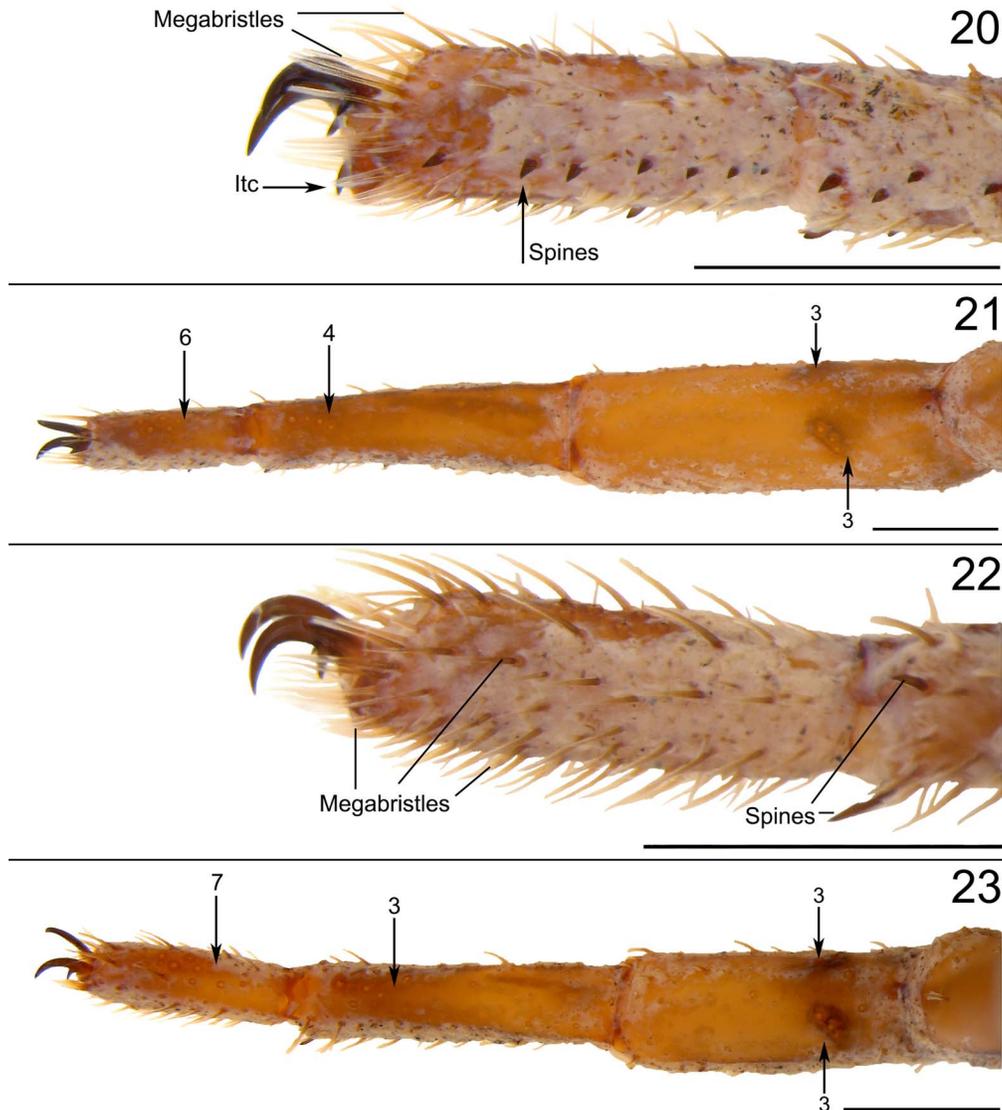


Figures 13–19.—*Paratropis celiae* sp. nov., paratype female: 13, habitus, dorsal view; 14, habitus, ventral view; 15, ocular tubercle; 16, sternum, labium and maxillae, ventral view; 17, spinnerets, ventral view; 18, 19, spermathecae. Scale bars: 1 mm.

distinguished from all these species by a torsion on the median area of spermathecae and the smaller terminal lobe of the spermathecae (Figs. 18, 19).

**Description (male holotype).**—Total length 9.5, carapace length 4.89, width 4.64; abdomen length 4.61, width 3.24; chelicerae length 1.71. Fovea slightly procurved, 0.75 wide (Fig. 1). Eyes and ocular tubercle: tubercle length 0.84, width 0.97, very elevated (height 1.1), slightly forwardly directed, with few setae (Figure 3). Clypeus absent. Anterior eye row slightly procurved, posterior recurved. Ocular sizes and interdistances: AME 0.37, ALE 0.21, PME 0.14, PLE 0.19, AME–AME 0.05, AME–ALE 0.03, PME–PME 0.51, PME–PLE 0.02, ALE–PLE 0.05, AME–PME 0.04, ALE–ALE 0.70, PLE–PLE 0.71. Chelicerae: short sparse bristles on dorsal and lateral areas, long fine bristles on ventral and anterior area. Rastellum absent. Cheliceral furrow with two rows of well-

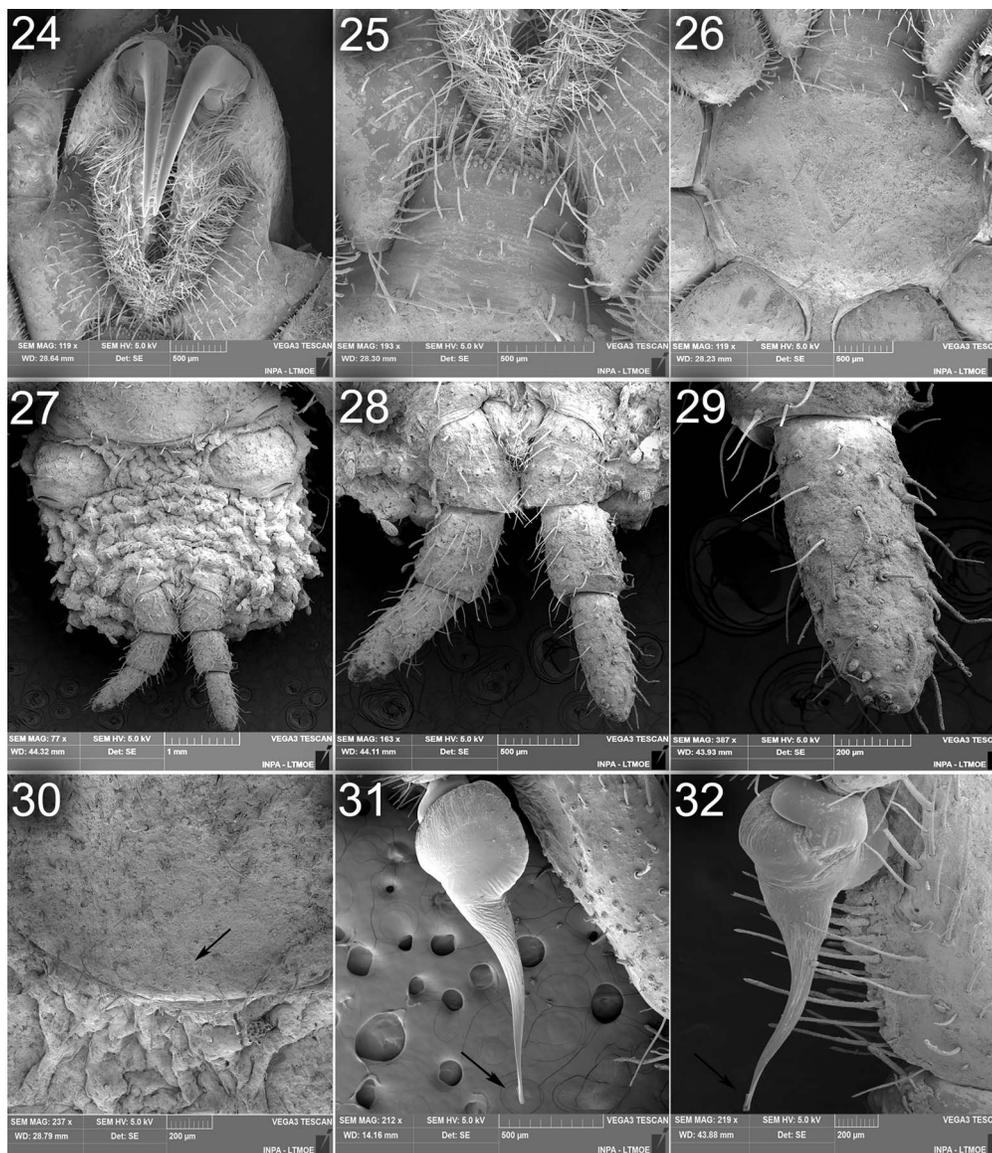
developed teeth, 11/12 and 10/11 teeth on promargin and retromargin, respectively. Labium: sub-rectangular, length 0.72, width 1.20, with 32 cuspules on anterior edge (Figs. 4, 25). Labio-sternal groove with two lateral sigilla. Maxillae longer than wide, the anterior prolateral lobe very elongated, conical (Figs. 4, 24); with 26/27 cuspules spaced, largely spread over prolateral-ventral border from the inner edge to anterior lobe. Sternum: heart shaped, length 1.91, width 2.44; three pairs of sigilla, anterior subcircular, median and posterior oval; anterior and median marginal, posterior submarginal. Anterior edge of sternum with a semicircular area slightly elevated (joined to labio-sternal groove) (Figs. 4, 26). Legs: cuticle with soil particles encrusted. Leg and palpal segments measurements in Table 1. Tarsi lacking small spines. Leg I clearly thicker than the others. Leg I without tibial spurs. Setae-like spines, and spines present. Trichobothria: filiform, on central



Figures 20–23.—*Paratropis celiae* sp. nov., paratype female: 20, left tarsal claws I, retrolateral view; 21, left tibiae I, metatarsi and tarsus, dorsal view; 22, left tarsus II, retrolateral view; 23, left tibiae II, metatarsi and tarsus, dorsal view (arrow points to ITC present on leg I). Scale bars: 1 mm.

2/3 of tarsi, palp 2, leg I 13, II 10, III 6, IV 8; on distal 1/4 of metatarsi, leg I 30, II 12, III 7, IV 15; on proximal 1/3 of tibiae, leg I 28, II 15, III 8, IV 8; palpal tibia with two, tarsi of legs I with six, tibiae I, II, III and IV with three trichobothria. Scopula or pseudoscopula absent. Claw tufts absent. Tarsal claws: ITC present on leg I (Figs. 33, 34); STC with one curved tooth on all legs. Spination: palp fe 0, pa 0, ti 0, ta 0; leg I fe 0, pa 0, ti 1pd, me 2pd, 1v, ta 1pd, 0v; leg II fe 0, pa 0, ti 2pd, 2v, me 3pd, 2v, ta 2pd, 0v; leg III fe 0, pa 0, ti 1pd, 4v, me 1pd, 2pv, 1rv, 3v, ta 0pd, 0v; leg IV fe 0, pa 0, ti 4v, me 2pd, 1pv, 2rv, 3v, ta 4v, principally spines-like setae on all segments. Megabristles: palp fe 0, pa 0, ti 0, ta 0pd, 0rv; leg I fe 3pv, 6v, pa 6pd, 1v, ti 10pd, 7v, me 14pv, 4rv, 21v, ta 13pv, 10rv; leg II fe 5pd, 7v, pa 7pd, 1v, ti 8pd, 4pv, 7rv, 15v, me 11pd, 14pv, 17rv, 22v, ta 10pd, 8pv, 16rv, 18v; leg III fe 6pd, 0v, pa 4pd, 0v, ti 7pd, 8pv, 0rv, 8v, me 8pd,

14pv, 9rv, 18v, ta 8pd, 7pv, 8rv; leg IV fe 11pd, 2pv, 0rv, 5, pa 3pd, 0pv, 1rv, 0v, ti 6pd, 0pv, 2rv, 3v, me 8pd, 6pv, 2rv, 18v, ta 5pd, 2pv, 8rv, 8v. Palp: cymbium with two unequal lobes separated by a sclerotized groove; tibia with distoventral groove. Elongated globose palpal bulb; embolus as long as tibia and half patella length, tapering to apex, apex broad; a translucent triangular tooth in the subapical region, close to the apex (Figs. 6–8, 31–33). Abdomen: with four longitudinal dorsal rows of seven small tubercles, each with a plumose, bacilliform seta. Book lung apertures projected, oval, sclerotized (Figs. 2, 27). Spinnerets: PMS: 0.28 long, 0.12 wide, 0.04 apart; PLS: 0.54 basal, 0.57 middle, 0.86 distal; midwidths 0.46, 0.42, 0.33, respectively; apical segment digitiform. Basal segment of PLS divided in three unequal cuticle plates (Figs. 5, 28, 29). Color (in alcohol): body with soil particles encrusted; carapace and legs reddish dark

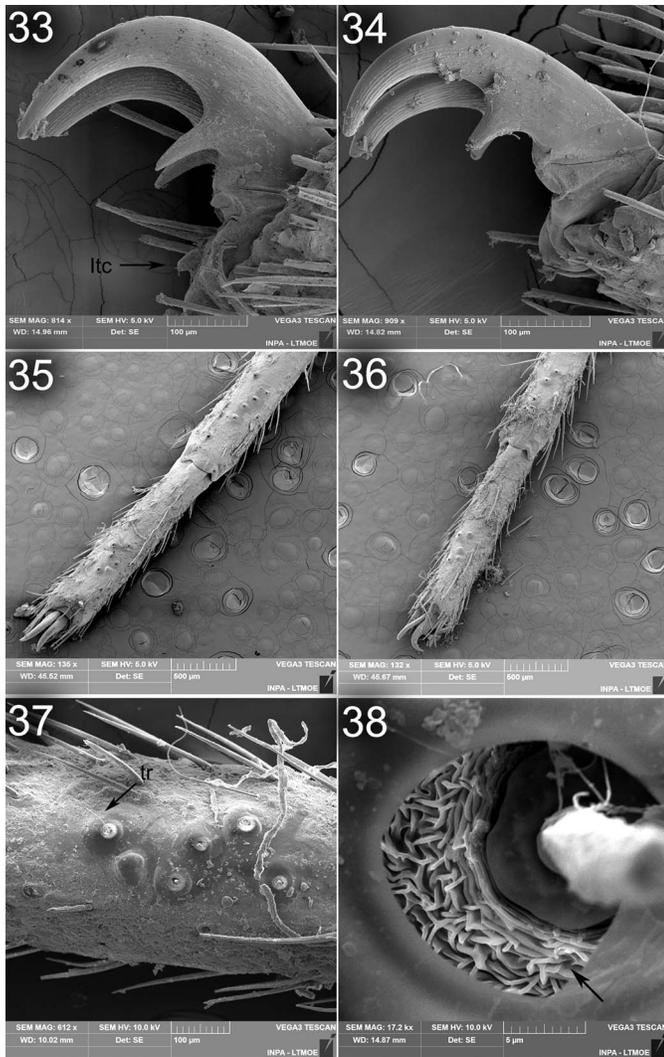


Figures 24–32.—*Paratropis celiae* sp. nov., holotype male: 24, chelicera and maxillae, ventral view; 25, labium, ventral view; 26, sternum, ventral view; 27, abdomen, ventral view; 28, 29, spinnerets, ventral view; 30, epigastric region, ventral view; 31, left palpal bulb, prolateral view; 32, left palpal bulb, retrolateral view. Arrow points to the triangular tooth on the subapical region of the embolus.

brown, chelicerae dark brown, abdomen grayish brown (Figs. 1, 2, 9–12).

**Description (female paratype INPA-ARA 9115).**—Total length 13.4, carapace length 5.34, width 5.14; abdomen length 8.16, width 6.23; chelicerae length 2.79. Fovea slightly procurved, 1.05 wide (Fig. 13). Eyes and ocular tubercle: tubercle length 1.19, width 0.76, very elevated (height 0.85) and slightly forwardly directed, with few setae (Fig. 15). Clypeus absent. Anterior eye row slightly procurved, posterior recurved. Ocular sizes and interdistances: AME 0.24, ALE 0.23, PME 0.14, PLE 0.22, AME–AME 0.11, AME–ALE 0.07, PME–PME 0.46, PME–PLE 0.04, ALE–PLE 0.06, AME–PME 0.08, ALE–ALE 0.67, PLE–PLE 0.66. Chelicerae: short sparse bristles on dorsal and lateral areas, long fine bristles on ventral and anterior area. Rastellum absent.

Cheliceral furrow with two rows of well-developed teeth, 12/11 and 8/10 teeth on promargin and retromargin, respectively. Labium: sub-rectangular, length 1.30, width 0.91, with 46 cuspules on anterior edge (Figs. 16, 40). Labio-sternal groove with two lateral sigilla. Maxillae longer than wide, with the anterior prolateral lobe very elongated, conical (Figs. 16, 39); with 48/47 cuspules spaced, largely spread over prolateral-ventral border from the inner edge to anterior lobe. Sternum: heart shaped, length 3.07, width 2.26; three pairs of sigilla, anterior subcircular, median and posterior oval; anterior and median marginal, posterior submarginal. Anterior edge of sternum with a semicircular area slightly elevated (joined to labio-sternal groove) (Figs. 16, 41). Legs: cuticle with soil particles encrusted. Leg and palpal segments measurements in Table 1. Tarsus of female ventrally with two rows of thick



Figures 33–38.—*Paratropis celiae* sp. nov., holotype male: 33, 34, left tarsal claws I–II, retrolateral view; 35, 36, left tarsus I, dorsal view; 37, left tarsus I, trichobothrial, dorsal view; 38, left trichobothria socket, apical view (arrow points to convolution in trichobothria socket).

and small spines. Leg I clearly thicker than the others. Setae-like spines, and spines present. Trichobothria: filiform, on central 2/3 of tarsi, palp 16, leg I 15, II 11, III 12, IV 12; on distal 1/4 of metatarsi, leg I 18, II 26, III 8, IV 19; on proximal 1/3 of tibiae, leg I 48, II 29, III 15, IV 29; palpal tibia with two, tarsi of legs I with five, tibiae I, II, III and IV with three trichobothria. Scopula or pseudoscopula absent. Claw tufts absent. Tarsal claws: ITC present on leg I (Figs. 48, 49); STC with one curved tooth on all legs. Spination: palp fe 0, pa 0, ti 0, ta 2pd, 4v; leg I fe 0, pa 0, ti 0, me 22v, ta 16v; leg II fe 0, pa 0, ti 0, me 1rv, 6v, ta 0; leg III fe 0, pa 0, ti 3v, me 1pd, 1pv, 3v, ta 2pd, 1v; leg IV fe 0, pa 0, ti 0, me 1pd, 7v, ta 5pd, 1v, principally spines-like setae on all segments. Megabristles: palp fe 0, pa 2pd, ti 2pd, ta 9pv, 12rv, 3v; leg I fe 1pd, pa 0pd, ti 0pd, me 2pv, 3rv, 17v, ta 2pd, 8pv, 6rv, 16v; leg II fe 0pd, pa 0pd, ti 1pd, 2pv, 2rv, 1v, me 2pd, 6pv, 17rv, 24v, ta 8pd, 5pv, 5rv, 35v; leg III fe 0pd, 5v, pa 0pd, 0v, ti

1pd, 2pv, 2rv, 8v, me 2pd, 6pv, 4rv, 20v, ta 8pd, 5pv, 10rv, 17v; leg IV fe 0pd, 2pv, 1rv, 0v, pa 3pd, 0pv, 1rv, 0v, ti 0pd, 2pv, 2rv, 5v, me 2pd, 7pv, 6rv, 13v, ta 9pd, 8pv, 11rv, 18v. Abdomen: with four longitudinal dorsal rows of seven small tubercles, each with a plumose, bacilliform seta. Book lung apertures projected, oval, sclerotized (Figs. 14, 42, 45). Two spermathecae with a neck delimiting a single terminal lobe, with a short base and slight median fold, globose apex, spermathecal fundus with a high density of glands (Figs. 18, 19). Spinnerets: PMS: 0.39 long, 0.22 wide, 0.20 apart; PLS: 1.15 basal, 0.68 middle, 0.83 distal; midwidths 0.52, 0.48, 0.41, respectively, apical segment digitiform. Basal segment of PLS divided in three unequal cuticle plates (Figs. 17, 43, 44, 46, 47). Color (in alcohol): body with encrusted sand particles; carapace and legs grayish brown, chelicerae dark brown, abdomen grayish brown (Figs. 13, 14, 20–23).

**Distribution.**—Only known from its type locality, in the Acariquara, Manaus, state of Amazonas, Brazil.

**Natural history.**—All specimens were hand collected at night in humid tropical forest, in soil.

*Paratropis manauara* sp. nov.

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(Figs. 54–76)

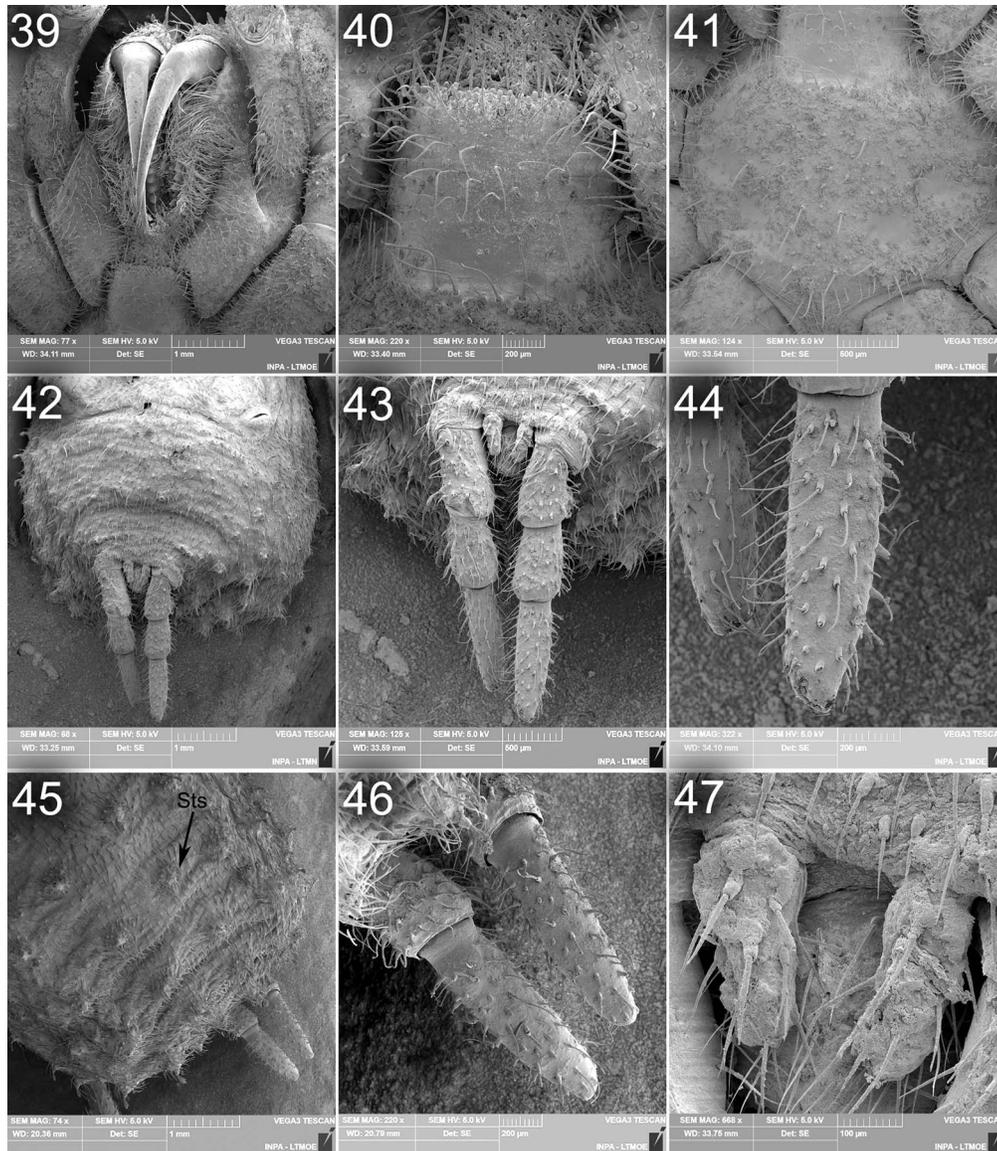
**Type material.**—*Holotype male*. BRAZIL: Amazonas: Manaus, UFAM, [−3.040082°, −059.376535°], 30 January 2018, M. Almeida (INPA-ARA 9116).

*Paratype*. BRAZIL: Amazonas: 1 ♀, same data as holotype (INPA-ARA 9116).

**Etymology.**—The specific name, *manauara*, is a noun in apposition honoring the native inhabitants of the Manaus region in the state of Amazonas, Brazil.

**Diagnosis.**—Males of *Paratropis manauara* sp. nov. resemble those of *P. celiae* sp. nov. and *Stormtropis muisca* (see Discussion, below) by having a translucent triangular tooth on the subapical region of the embolus in combination with the absence of a tibial apophysis (Figs. 59–61). They can be distinguished from *P. celiae* sp. n. by their larger size and almost straight embolus (Fig. 61); and from *S. muisca* by the embolus narrowing abruptly at its base (Fig. 60). Females resemble those of *P. celiae* sp. nov., *S. paisa* (see Discussion, below), *P. esmeraldas* Dupérré & Tapia, 2024, *P. pukallucha* Dupérré & Tapia, 2024, *P. kapak* Dupérré & Tapia, 2024, *P. carcosita* Dupérré & Tapia, 2024, and *P. pasochoa* Dupérré & Tapia, 2024 by the non-multilobular shape of the spermathecae, but can be distinguished from those of *S. paisa* by the presence of non-dilated terminal lobes on the spermathecae; from *P. celiae* sp. nov. by lacking a median torsion of the spermathecae and the large terminal lobe of the spermathecae; and from *P. esmeraldas* Dupérré & Tapia, 2024, *P. pukallucha* Dupérré & Tapia, 2024, *P. kapak* Dupérré & Tapia, 2024, *P. carcosita* Dupérré & Tapia, 2024, and *P. pasochoa* Dupérré & Tapia, 2024 by the triangular shaped base of spermathecae and the very constricted portion at the base of the lobe (Figs. 71, 72).

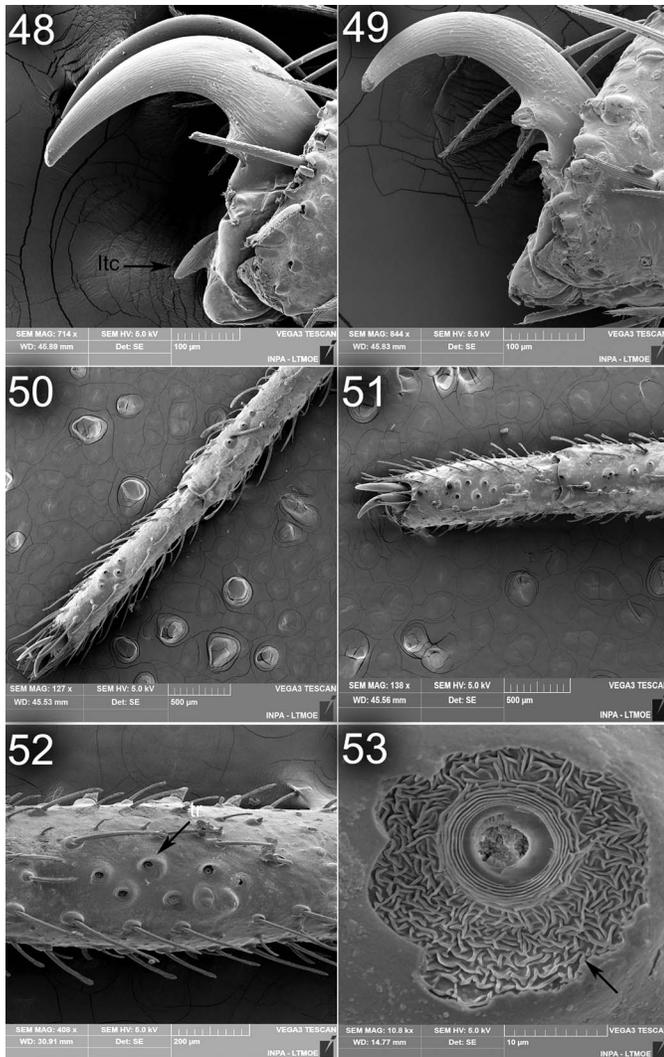
**Description (male holotype).**—Total length 14.51, carapace length 7.16, width 7.35; abdomen length 7.10, width 5.36; chelicerae length 2.73. Fovea slightly procurved, 1.43 wide



Figures 39–47.—*Paratropis celiae* sp. nov., paratype female: 39, chelicera and maxillae, ventral view; 40, labium, ventral view; 41, sternum, ventral view; 42, abdomen, ventral view; 43, 44, 46, 47, spinnerets, ventral view; 45, abdomen, dorsal view (the arrow points to the location).

(Fig. 54). Eyes and ocular tubercle: tubercle length 1.18, width 1.26, very elevated (height 0.98) and slightly forwardly directed, with few setae (Fig. 56). Clypeus absent. Anterior eye row slightly procurved, posterior recurved. Ocular sizes and interdistances: AME 0.35, ALE 0.34, PME 0.18, PLE 0.32, AME–AME 0.10, AME–ALE 0.10, PME–PME 0.66, PME–PLE 0.064, ALE–PLE 0.078, AME–PME 0.095, ALE–ALE 1.03, PLE–PLE 0.94. Chelicerae: short sparse bristles on dorsal and lateral areas, long fine bristles on ventral and anterior area. Rastellum absent. Cheliceral furrow with two rows of well-developed teeth, 12/12 and 8/9 teeth on promargin and retromargin, respectively. Labium: sub-rectangular, length 1.62, width 1.17, with 43 cuspules on anterior edge (Fig. 57). Labio-sternal groove with two lateral mounds. Maxillae longer than wide, with the anterior prolateral lobe very elongated, conical (Fig. 57); with 78/82 cuspules

spaced, largely spread over prolateral-ventral border from the inner edge to anterior lobe. Sternum: heart shaped length 3.71, width 3.13; three pairs of sigilla, anterior subcircular, median and posterior oval; anterior and median marginal, posterior submarginal. Anterior edge of sternum with a semi-circular area slightly elevated (joined to labio-sternal groove) (Fig. 57). Legs: cuticle with soil particles encrusted. Leg and palpal segments measurements in Table 2. Leg I clearly thicker than the others. Leg I without tibial spurs. Tarsi lacking small spines. Setae-like spines, and spines present. Trichobothria: filiform, on central 2/3 of tarsi, palp 1, leg I 18, II 8, III 7, IV 8; on distal 1/4 of metatarsi, leg I 51, II 31, III 18, IV 19; on proximal 1/3 of tibiae, leg I 52, II 32, III 45, IV 31; palpal tibia with two, tarsi of legs I with eight, tibiae I, II, III and IV with four trichobothria. Scopula or pseudoscopula absent. Claw tufts absent. Tarsal claws: ITC present on leg I



Figures 48–53.—*Paratropis celiae* sp. nov., paratype female: 48, 49, left tarsal claws I-II, retrolateral view, 50, 51, left tarsus I, dorsal view; 52, left tarsus I, trichobothrial, dorsal view; 53, left trichobothria socket, apical view (arrow points to convolvement in trichobothria socket).

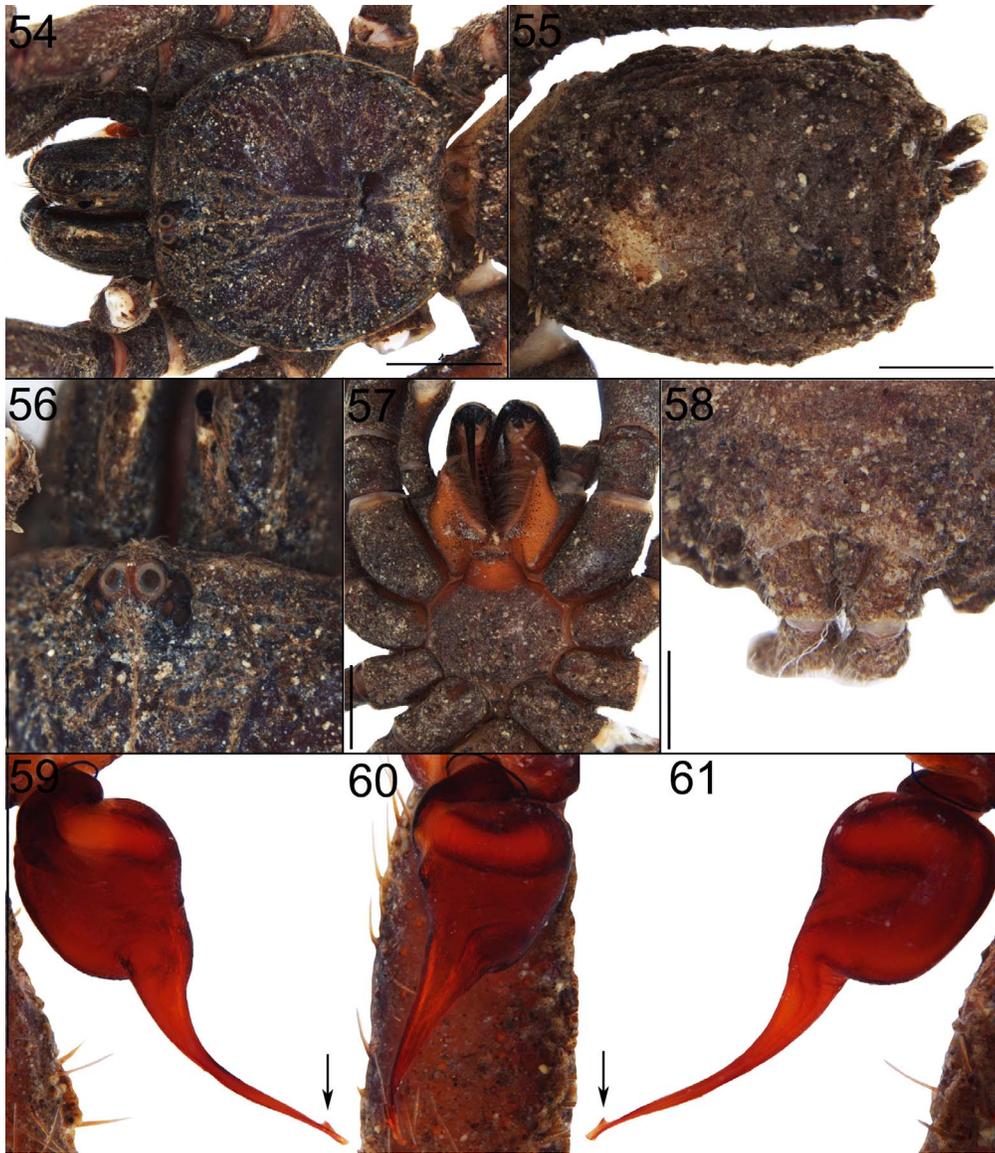
(Fig. 62); STC with one curved tooth on all legs. Spination: palp fe 0, pa 0, ti 0, ta 0; leg I fe 0, pa 0, ti 0, me 0, ta 0; leg II fe 0, pa 0, ti 0, me 2v, ta 1v; leg III fe 0, pa 0, ti 2v, me 4v; leg IV fe 0, pa 0, ti 0, me 1pv, 1rv, 4v, ta 2v, principally spines-like setae on all segments. Megabristles: palp fe 10pd, pa 11pd, ti 20pd, ta 0pv, 0rv; leg I fe 0pd; pa 0pd, ti 4pd, 37v, me 8pd, 20pv, 11rv, 27v; ta 3pd, 2v; leg II fe 0pd, 4v, pa 3pd, 4pv, 0v, ti 2pd, 12pv, 0rv, 0v, me 2pd, 10pv, 12rv, 30v, ta 15pd, 11pv, 12rv, 31v; leg III fe 0pd, 3pv, 4v, pa 5pd, 2pv, 2rv, 0v, ti 7pd, 7pv, 9rv, 20v, me 15pd, 13pv, 11rv, 27v, ta 17pd, 22pv, 11rv, 27v; leg IV fe 0 pd, pa 0pd, 1pv, 1rv, 0v, ti 0pd, 10pv, 3rv, 16v, me 16pd, 11pv, 16rv, 32v, ta 20pd, 14pv, 16rv, 28v. Palp: cymbium with two unequal lobes separated by a sclerotized groove; tibia with distoventral groove. Elongated globose palpal bulb; embolus slightly curved, tapering to the apex, which is stout but flat; a small subapical distal triangular tooth. (Figs. 59–61). Abdomen: with four longitudinal

Table 1.—Lengths (in mm) of legs and palpal segments of the holotype male (INPA 9115) / female (INPA 9115) *Paratropis celiae* sp.n.

	I	II	III	IV	Palp
Femur	4.0/3.6	3.4/2.8	3.0/2.4	3.6/3.7	1.8/2.1
Patella	2.1/2.1	1.7/1.6	1.5/1.5	1.6/1.7	1.0/1.3
Tibia	3.4/3.0	2.4/2.1	1.8/1.6	3.19/3.0	1.2/1.1
Metatarsus	3.2/2.4	2.7/2.1	2.4/1.9	3.1/3.2	—
Tarsus	1.5/1.3	1.3/1.2	1.4/1.3	1.7/1.6	0.6/1.7
Total	14.2/12.4	11.5/9.8	10.1/8.7	13.19/13.2	4.6/6.2

dorsal rows of seven small tubercles, each with a plumose, bacilliform seta. Book lung apertures projected, oval, sclerotized (Fig. 55). Spinnerets: PMS: 0.44 long, 0.24 wide, 0.04 apart; PLS: 0.82 basal, 0.73 middle, 1.04 distal; midwidths 0.72, 0.64, 0.47, respectively, apical segment digitiform. Basal segment of PLS divided in three unequal cuticle plates (Fig. 58). Color (in alcohol): body with little soil particles encrusted; carapace and legs reddish dark brown, chelicerae dark brown, abdomen dark (Figs. 54–55, 62–65).

**Description (female paratype INPA-ARA 9116).**—Total length 17.61, carapace length 8.92, width 8.69; abdomen length 11.72, width 9.30; chelicerae length 4.24. Fovea slightly procurved, 1.34 wide (Fig. 66). Eyes and ocular tubercle: tubercle length 1.69, width 1.64, very elevated (height 1.35) and slightly forwardly directed, with few setae (Fig. 68). Clypeus absent. Anterior eye row slightly procurved, posterior recurved. Ocular sizes and interdistances: AME 0.39, ALE 0.31, PME 0.13, PLE 0.24, AME–AME 0.15, AME–ALE 0.13, PME–PME 0.91, PME–PLE 0.07, ALE–PLE 0.18, AME–PME 0.14, ALE–ALE 1.16, PLE–PLE 1.10. Chelicerae: short sparse bristles on dorsal and lateral areas, long fine bristles on ventral and anterior area. Rastellum absent. Cheliceral furrow with two rows of well-developed teeth, 14/14 and 9/9 teeth on promargin and retromargin, respectively. Labium: sub-rectangular, length 1.99, width 2.26, with 56 cuspules on anterior edge (Fig. 69). Labio-sternal groove with two lateral mounds. Maxillae longer than wide, with the anterior prolateral lobe very elongated, conical (Fig. 69); with 95/84 cuspules spaced, largely spread over prolateral-ventral border from the inner edge to anterior lobe. Sternum: heart shaped length 3.78, width 4.82; three pairs of sigilla, anterior subcircular, median and posterior oval; anterior and median marginal, posterior submarginal. Anterior edge of sternum with a semicircular area slightly elevated (joined to labio-sternal groove) (Fig. 69). Legs: cuticle with soil particles encrusted. Leg and palpal segments measurements in Table 2. Tarsus of female ventrally with two rows of thick and small spines. Leg I clearly thicker than the others. Setae-like spines, and spines present. Trichobothria: filiform, on central 2/3 of tarsi, palp 28, leg I 23, II 17, III 17, IV 15; on distal 1/4 of metatarsi, leg I 29, II 24, III 27, IV 36; on proximal 1/3 of tibiae, leg I 111, II 56, III 63, IV 62; palpal tibia with two, tarsi of legs I with seven, tibiae I, II, III and IV with four trichobothria. Scopula or pseudoscopula absent. Claw tufts absent. Tarsal claws: ITC present on leg I (Fig. 73); STC with one curved tooth on all legs. Spination: palp fe 0, pa 0, ti 1rv, 1v, ta 4v; leg I fe 0, pa 0, ti 1rv, 42v,

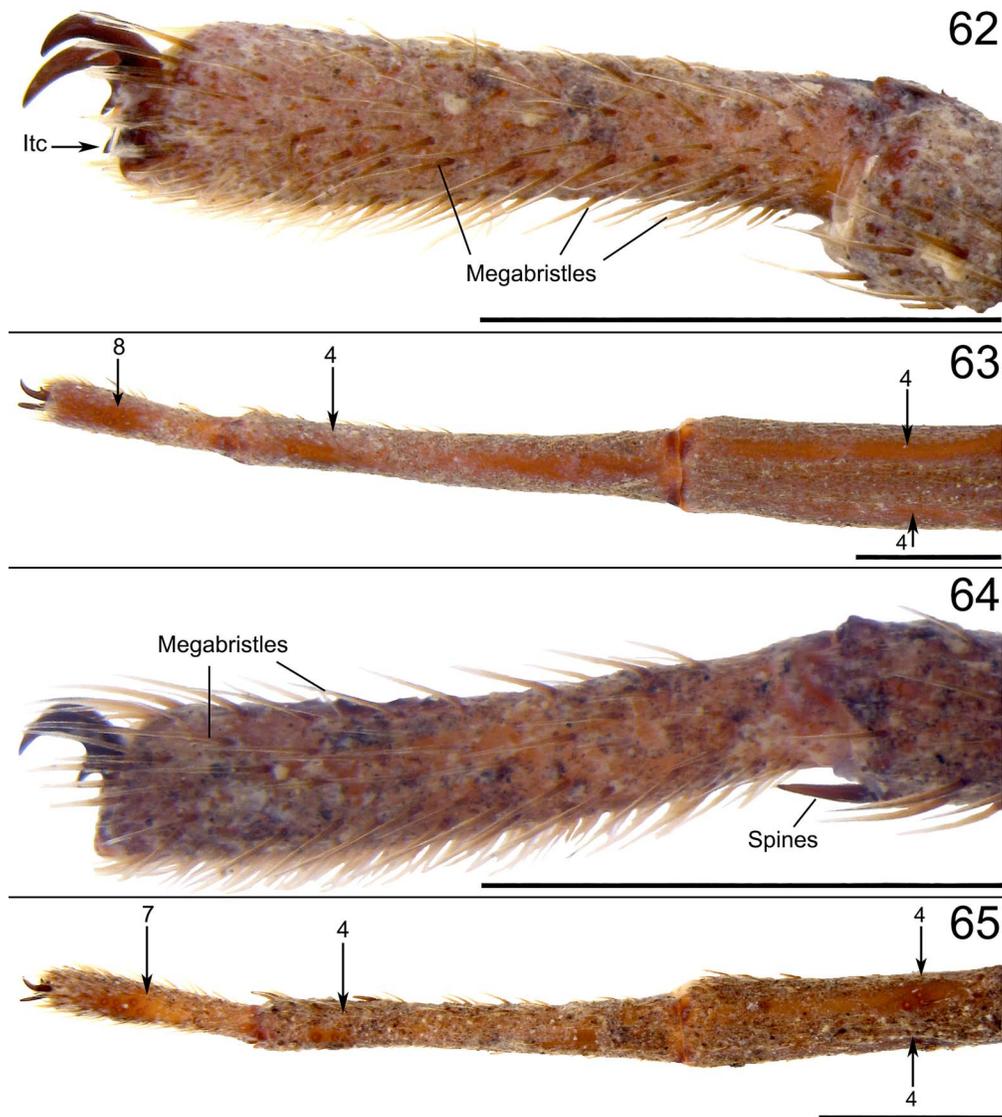


Figures 54–61.—*Paratropis manauara* sp. nov., holotype male: 54, 55, habitus, dorsal view; 56, ocular tubercle; 57, sternum, labium and maxillae, ventral view; 58, spinnerets, ventral view; 59, Left palpal bulb, prolateral view; 60, left palpal bulb, ventral view; 61, left palpal bulb, retrolateral view. Arrow points to the triangular tooth on the subapical region of the embolus. Scale bars: 2 mm.

me 6rv, 44v, ta 29v; leg II fe 0, pa 1v, ti 4v, me 1 pd, 1pv, 2rv, 8v, ta 6v; leg III fe 0, pa 1v, ti 2v, me 2rv, 6, ta 7v; leg IV fe 0, pa 0, ti 2v, me 1pd, 7v, ta 11v, principally spines-like setae on all segments. Megabristles: palp fe 12v; pa 2pd, 4pv, 1rv, 14v; ti 4pd, 7pv, 6rv, 13v; ta 4pd, 12pv, 8rv, 42v; leg I fe 4pd, 1pv, 0rv, 5v; pa 5pd, 1pv, 0rv, 2v; ti 5pd, 0pv, 3rv, 35v, me 7pd, 6pv, 5rv, 46v; ta 25pd, 11pv, 9rv, 27v; leg II tro 0pd, 3pv, 1rv, 7v; fe 2pd, 0pv, 0rv, 6v; pa 4pd, 4pv, 2rv, 0v; ti 17pd, 7pv, 9rv, 5v; me 27pd, 7pv, 13rv, 26v; ta 25pd, 10pv, 15rv, 30v; leg III fe 5pd, 2pv, 0rv, 4v; pa 8pd, 2pv, 2rv, 1v; ti 13pd, 7pv, 4rv, 8v; me 27pd, 7pv, 13rv, 30v; ta 13pd, 14pv, 14rv, 32v; leg IV fe 14pd, 1pv, 4rv, 4v; pa 7pd, 1pv, 3rv, 1v; ti 8pd, 8pv, 4rv, 8v; me 22pd, 15pv, 17rv, 32v; ta 25pd, 18pv, 26rv, 31v. Abdomen: with four longitudinal dorsal rows of seven small tubercles, each with a

plumose, bacilliform seta. Book lung apertures projected, oval, sclerotized (Fig. 67). Two spermathecae without necks, thick, with a broad base and a single apical lobe (resembling the shape of a human ear), glossy bottom to apex, with high density of glands (Figs. 71, 72). Spinnerets: PMS: 0.65 long, 0.35 wide, 0.04 apart; PLS: 1.42 basal, 0.90 middle, 1.09 distal; midwidths 0.91, 0.83, 0.62, respectively, apical segment digitiform. Basal segment of PLS divided in three unequal cuticle plates (Fig. 70). Color (in alcohol): body with encrusted soil particles; carapace and legs dark reddish brown, chelicerae dark brown, abdomen dark brown (Figs. 66–67, 73–76).

**Distribution.**—Only known from its type locality, in the Universidade Federal do Amazonas (UFAM), Manaus, state of Amazonas, Brazil.



Figures 62–65.—*Paratropis manauara* sp. nov., holotype male: 62, left tarsal claws I, retrolateral view; 63, left tibiae I, metatarsi and tarsus, dorsal view; 64, left tarsus II, retrolateral view; 65, left tibiae II, metatarsi and tarsus, dorsal view (arrow points to ITC present on leg I). Scale bars: 2 mm.

**Natural history.**—All specimens were hand collected at night in humid tropical forest, in soil.

*Paratropis vulcanix* sp. nov.

<http://zoobank.org/?lsid=urn:lsid:zoobank.org:act:9D1052A6-F651-4225-80AE-4E56FD43304B>  
(Fig. 77–83, 84–87)

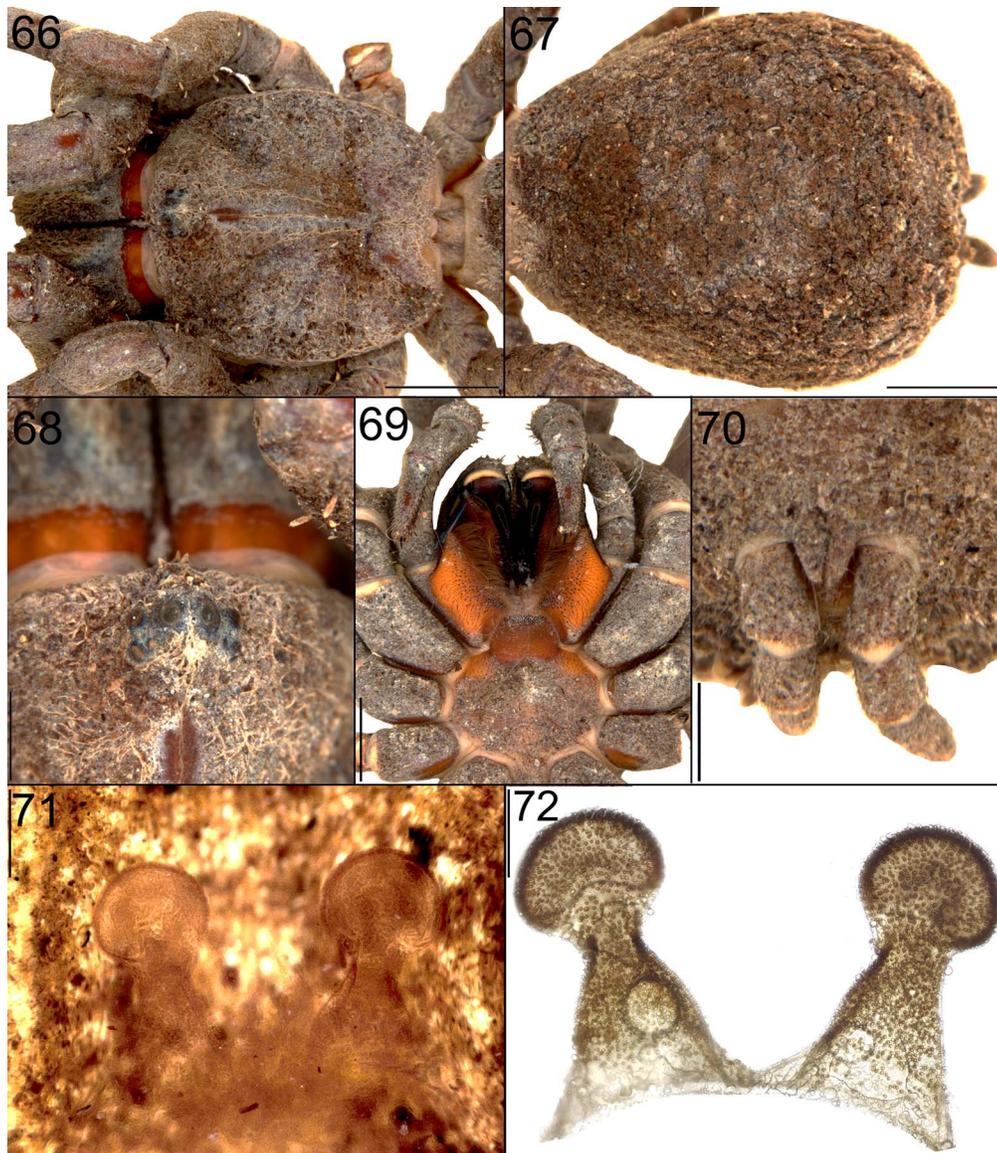
**Type material.**—*Holotype female*. COLOMBIA: Departamentos Tolima-Caldas, Nevado del Ruiz near El Silencio, [4.5988°, -075.3295°], 2,621 m a.s.l., 8 October 1978, Prof. H. Sturm (MCZ 71028).

**Etymology.**—The specific epithet is a noun in apposition and refers to the type locality, Nevado del Ruiz, a snowy Colombian volcano.

**Diagnosis.**—Females of *Paratropis vulcanix* sp. nov. differ from all other species of *Paratropis* by the presence of a

third tarsal claw on all legs. They can also be distinguished by their short and rounded, globose spermathecae, convex from base to apex and mountain-shaped (Figs. 82, 83). Males are unknown.

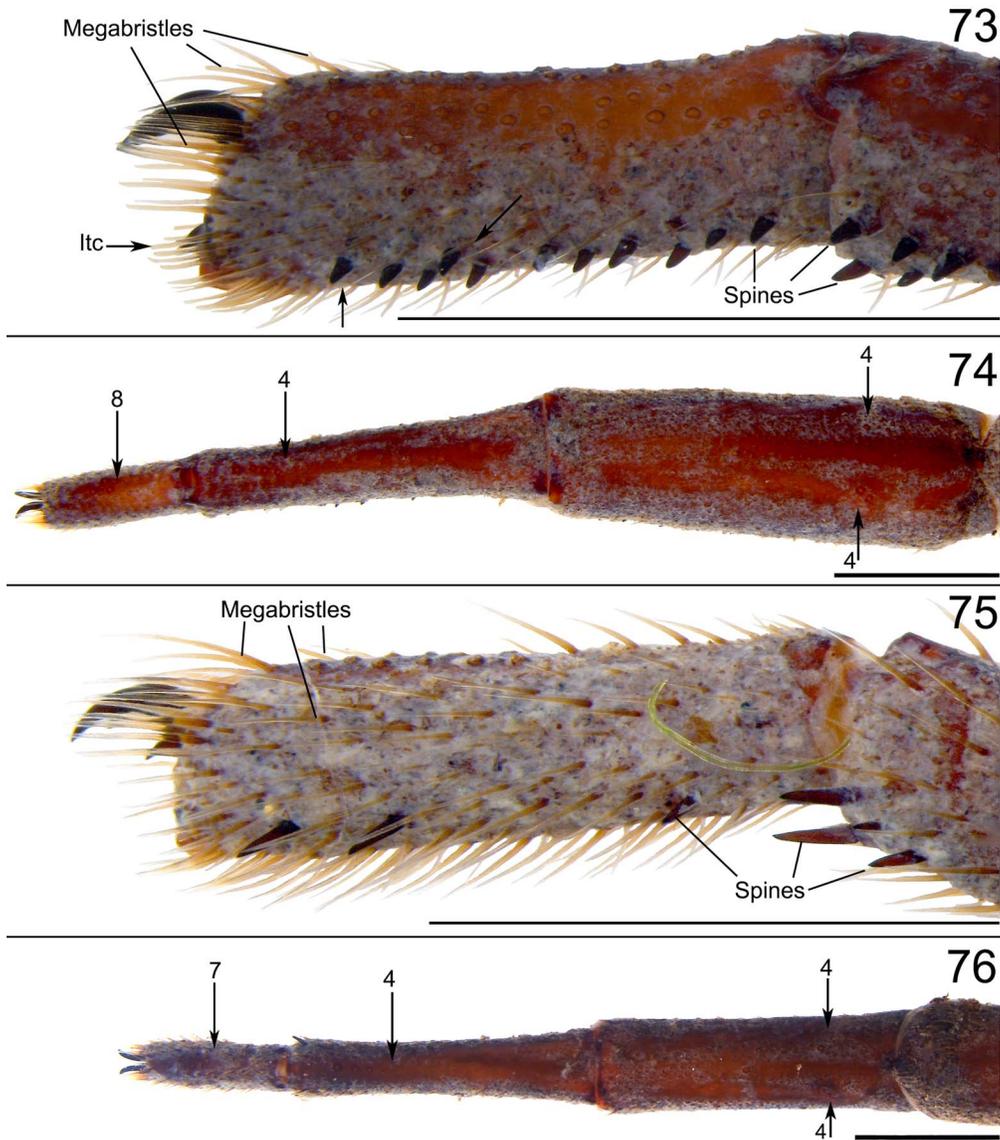
**Description (female holotype).**—Total length 10.06, carapace length 5.27, width 4.79; abdomen length 8.65, width 5.87; chelicerae length 2.95. Fovea slightly procurved, 0.74 wide (Fig. 77). Eyes and ocular tubercle: tubercle length 1.13, width 0.95, very elevated (height 0.88) and slightly forwardly directed, with few setae (Fig. 79). Clypeus absent. Anterior eye row slightly procurved, posterior recurved. Ocular sizes and interdistances: AME 0.16, ALE 0.20, PME 0.15, PLE 0.17, AME–AME 0.11, AME–ALE 0.08, PME–PME 0.36, PME–PLE 0.06, ALE–PLE 0.10, AME–PME 0.06, ALE–ALE 0.62, PLE–PLE 0.68. Chelicerae: short sparse bristles on dorsal and lateral areas, long fine bristles on ventral and anterior area. Rastellum absent. Cheliceral



Figures 66–72.—*Paratropis manauara* sp. nov., paratype female: 66, 67, habitus, dorsal view; 68, ocular tubercle; 69, sternum, labium and maxillae, ventral view; 70, spinnerets, ventral view; 71, 72, spermathecae. Scale bars: 2 mm.

furrow with two rows of well-developed teeth, 10/9 and 5/6 teeth on promargin and retromargin, respectively. Labium: sub-rectangular, length 1.10, width 1.22, with 36 cuspules on anterior edge (Fig. 80). Labio-sternal groove with two lateral sigilla. Maxillae longer than wide, with the anterior prolateral lobe very elongated, conical (Fig. 80); with 48/49 cuspules spaced, largely spread over prolateral-ventral border from the inner edge to anterior lobe. Sternum: heart shaped length 2.24, width 2.52; three pairs of sigilla, anterior subcircular, median and posterior oval; anterior and median marginal, posterior submarginal. Anterior edge of sternum with a semicircular area slightly elevated (joined to labio-sternal groove) (Fig. 80). Legs: cuticle without soil particles encrusted. Leg and palpal segment measurements in Table 3. Tarsus of the female ventrally with two rows of thick and long spines. Leg I clearly thicker than the others.

Ventral metatarsus with thick and long spines. Setae-like spines, and spines present. Trichobothria: filiform, on central 2/3 of tarsi, palp 7, leg I 15, II 14, III 11, IV 11; on distal 1/4 of metatarsi, leg I 8, II 5, III 5, IV 5; on proximal 1/3 of tibiae, leg I 6, II 6, III 6, IV 6; palpal tibia with three, tarsi of legs I with six, tibiae I, II, III and IV with three trichobothria. Scopula or pseudoscopula absent. Claw tufts absent. Tarsal claws: ITC present on leg I, II, III, IV (Figs. 84–87); STC with one curved tooth on all legs. Spination: palp fe 0, pa 0, ti 0, ta 0; leg I fe 0, pa 0, ti 2v, me 1rv, 4v, ta 8v; leg II fe 0, pa 0, ti 2v, me 1pv, 1rv, 3v, ta 0; leg III fe 0, pa 0, ti 0, me 1pv, 3v, ta 0; leg IV fe 0, pa 0, ti 1v, me 1pv, 3v, ta 0, principally spines-like setae on all segments. Megabristles: palp fe 14pd, 30pv, 1rv, 31v; pa 15pd, 8pv, 9rv, 5v; ti 23pd, 15pv, 15rv, 32v; ta 24pd, 15pv, 17rv, 46v; leg I fe 30pd, 14pv, 14rv, 43v; pa 30pd, 9pv, 9rv, 9v; ti 29pd, 22pv, 32rv,



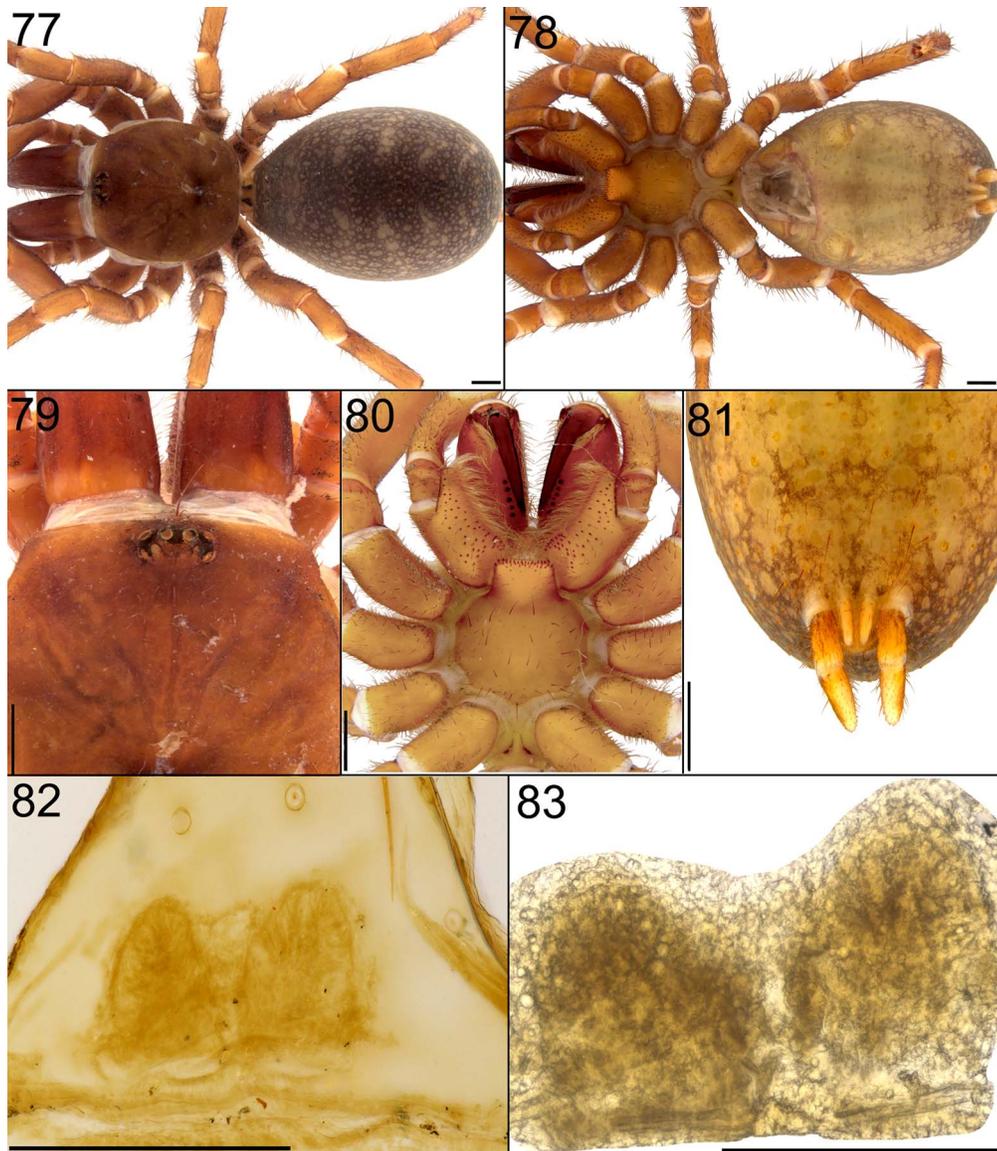
Figures 73–76.—*Paratropis manauara* sp. nov., paratype female: 73, left tarsal claws I, retrolateral view; 74, left tibiae I, metatarsi and tarsus, dorsal view; 75, left tarsus II, retrolateral view; 76, left tibiae II, metatarsi and tarsus, dorsal view (arrow points to ITC present on leg I). Scale bars: 2 mm.

28v; me 25pd, 14pv, 16rv, 28v; ta 17pd, 15pv, 15rv, 38v; leg II fe 16pd, 23pv, 22rv, 28v; pa 28pd, 8pv, 14rv, 8v; ti 20pd, 17pv, 14rv, 25v; me 17pd, 16pv, 13rv, 31v; ta 19pd, 18pv, 13rv, 42v; leg III fe 31pd, 18pv, 10rv, 28v; pa 24pd,

8pv, 8rv, 5v; ti 27pd, 15pv, 11rv, 20v; me 28pd, 10pv, 10rv, 37v; ta 19pd, 18pv, 12rv, 39v; leg IV fe 21pd, 24pv, 2rv, 29v; pa 16pd, 7pv, 6rv, 5v; ti 30pd, 18pv, 15rv, 33v; me 21pd, 19pv, 18rv, 34v; ta 16pd, 20pv, 15rv, 40v. Abdomen: with two longitudinal dorsal rows of seven small tubercles, each with a plumose, bacilliform seta. Book lung apertures projected, oval, sclerotized (Figs. 77, 78). Two short spermathecae, from the base to the convex, narrow (resembling the shape of a mountain) apex, spermathecal fundus with a high density of glands (Figs. 82, 83). Spinnerets: PMS: 0.61 long, 0.20 wide, 0.17 apart; PLS: only two articles are visible (see remark), 0.84 basal, 0.55 distal; midwidths 0.48, 0.35, respectively, apical segment digitiform. Basal segment of PLS divided in two unequal cuticle plates (Fig. 81). Color (in alcohol): body without soil particles encrusted; carapace and legs yellowish light brown, chelicerae dark brown, abdomen grayish brown (Figs. 77, 78, 84–87).

Table 2.—Lengths (in mm) of legs and palpal segments of the holotype male (INPA 9116)/female (INPA 9116) *Paratropis manauara* sp. n.

	I	II	III	IV	Palp
Femur	7.8/7.6	6.1/5.8	5.5/4.7	7.2/6.7	2.6/3.7
Patella	3.7/4.2	3.0/3.4	2.4/3.0	2.7/3.2	1.9/2.4
Tibia	6.6/5.7	4.6/3.9	3.8/3.1	6.1/5.4	2.1/2.2
Metatarsus	6.4/4.7	5.4/4.2	4.9/3.9	6.8/5.8	—
Tarsus	2.8/1.9	2.6/2.3	2.4/2.2	2.9/2.7	0.8/3.3
Total	27.3/24.1	21.7/19.6	19/16.9	25.7/23.8	7.4/11.6



Figures 77–83.—*Paratropis vulcanix* sp. nov., holotype female: 77, habitus, dorsal view; 78, habitus, ventral view; 79, ocular tubercle; 80, sternum, labium and maxillae, ventral view; 81, spinnerets, ventral view; 82, 83, spermathecae. Scale bars: 1 mm.

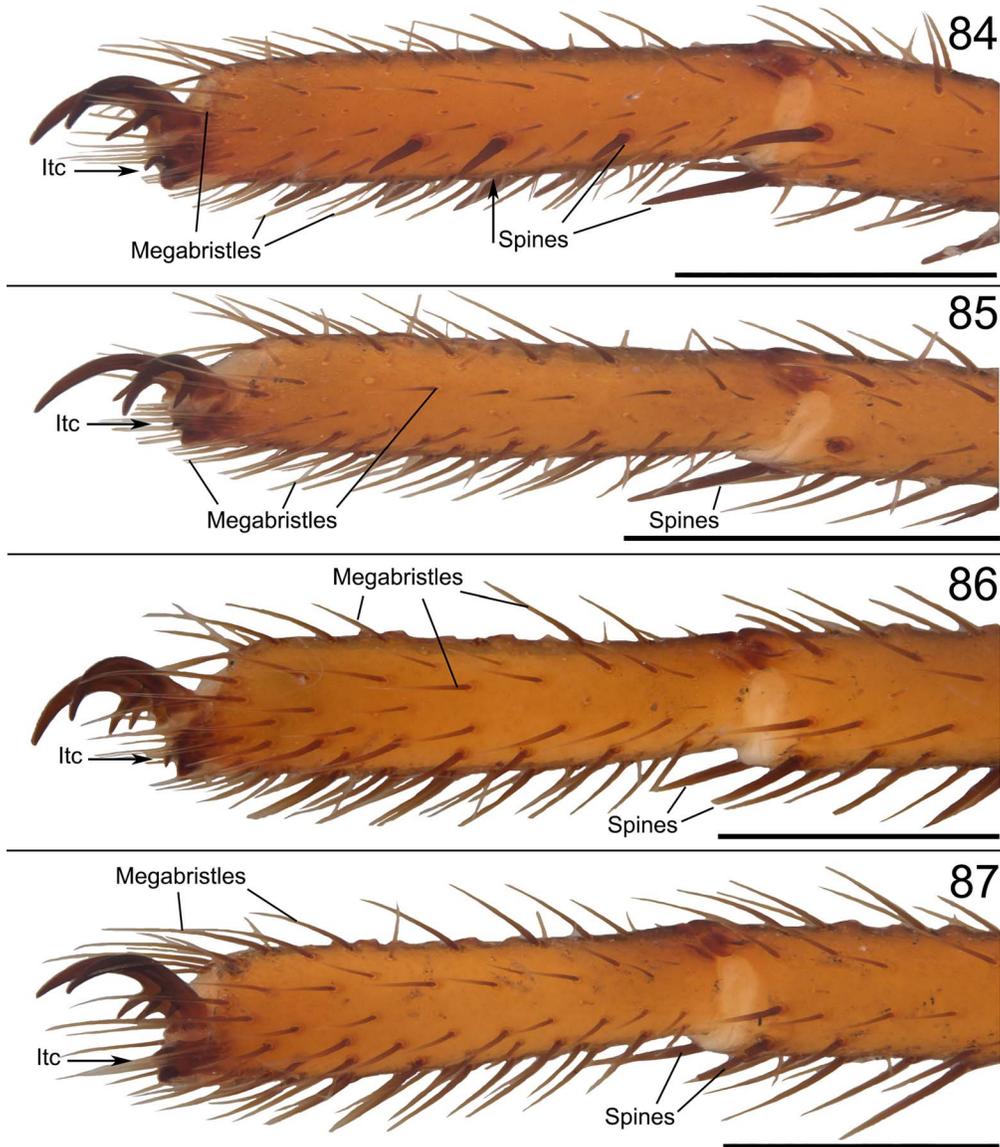
**Distribution.**—Only known from its type locality, in the Tolima-Caldas Nevado del Ruiz near El Silencio, Colombia.

**Remarks.**—We detected only two PLS articles on the holotype and found no sign of contraction of any segment. Unfortunately, there is only a single specimen, preventing the dissection of the abdomen to allow the segments to expand freely to confirm the real segment number. If confirmed, this is an additional apomorphy for the species, together with the presence of ITC on all legs.

#### DISCUSSION

The Paratropididae are a small, poorly studied mygalomorph family. Despite the recent efforts in describing new species and a new genus (Valdez-Mondragón et al. 2014; Dupérré, 2015; Perafán et al. 2019; Dupérré & Tapia, 2020; Almeida & Morais 2022;

Sherwood et al. 2022, 2023; Dupérré & Tapia, 2024), we still know relatively little about the taxonomy and diversity of the family, which now includes four genera and 26 described species, 21 of which are in the genus *Paratropis* (Fig. 88). The type species of the genus *Paratropis*, *P. scruposa*, has never been redescribed in detail since its original description in 1889, and important taxonomic information, such as the morphology of the genitalia, was never published. The male is unknown. This situation is also true for most species of Paratropididae described in the past two centuries (Simon 1889; Pickard-Cambridge 1896; Mello-Leitão 1923; Caporiacco 1955). The current generic diagnoses are also debatable and have never been tested with a phylogenetic analysis. Paratropidid generic diagnoses are traditionally based on the absence or presence of the PMS, the shape of the distal article of the PLS, two rows of cheliceral teeth juxtaposed or in two diagonally opposed rows, or the presence or absence of



Figures 84–87.—*Paratropis vulcanix* sp. nov., holotype female: 84–87, left tarsal claws I–IV, retrolateral view (arrow points to ITC present in all legs). Scale bars: 1 mm.

an inferior tarsal claw (Simon 1892, 1903; Pickard-Cambridge 1896; Raven 1985). However, with the description of more species in recent years, it is becoming clear that these characters may be highly homoplastic at the generic level.

Table 3.—Lengths (in mm) of legs and palpal segments of the holotype female (MCZ 71028) *Paratropis vulcanix* sp. n.

	I	II	III	IV	Palp
Femur	3.9	3.3	3.0	4.4	2.5
Patella	2.3	1.8	1.6	1.8	—
Tibia	3.2	2.4	1.7	3.1	—
Metatarsus	2.9	2.5	2.2	3.1	—
Tarsus	2.0	1.8	1.7	2.2	—
Total	14.3	11.8	10.2	14.6	2.5

The confusing taxonomic situation of Paratropididae is exemplified by two of the three new species herein described. *Paratropis celiae* sp. nov. and *P. manauara* sp. nov. have characters shared with the recently erected genus *Stormtropis*, including the presence of a subapical triangular tooth on the embolus, absence of leg spines in males, embolus slender with (*P. celiae* sp. nov.) or without (*P. manauara* sp. nov.) a curvature, and a low number of labial cuspules (fewer than 70). Despite only a single female of *Stormtropis*, *S. paisa*, having been described, its mushroom spermathecae shape was considered a diagnostic character for *Stormtropis* (Perafán et al. 2019), as all *Paratropis* species have long and slender multilobular spermathecae. The spermathecae of females of *P. celiae* sp. nov. and *P. manauara* sp. nov. are not mushroom shaped, but they are also not long, slender and multilobular as in other *Paratropis* species. Furthermore, *Stormtropis* males lack inferior tarsal claws on leg

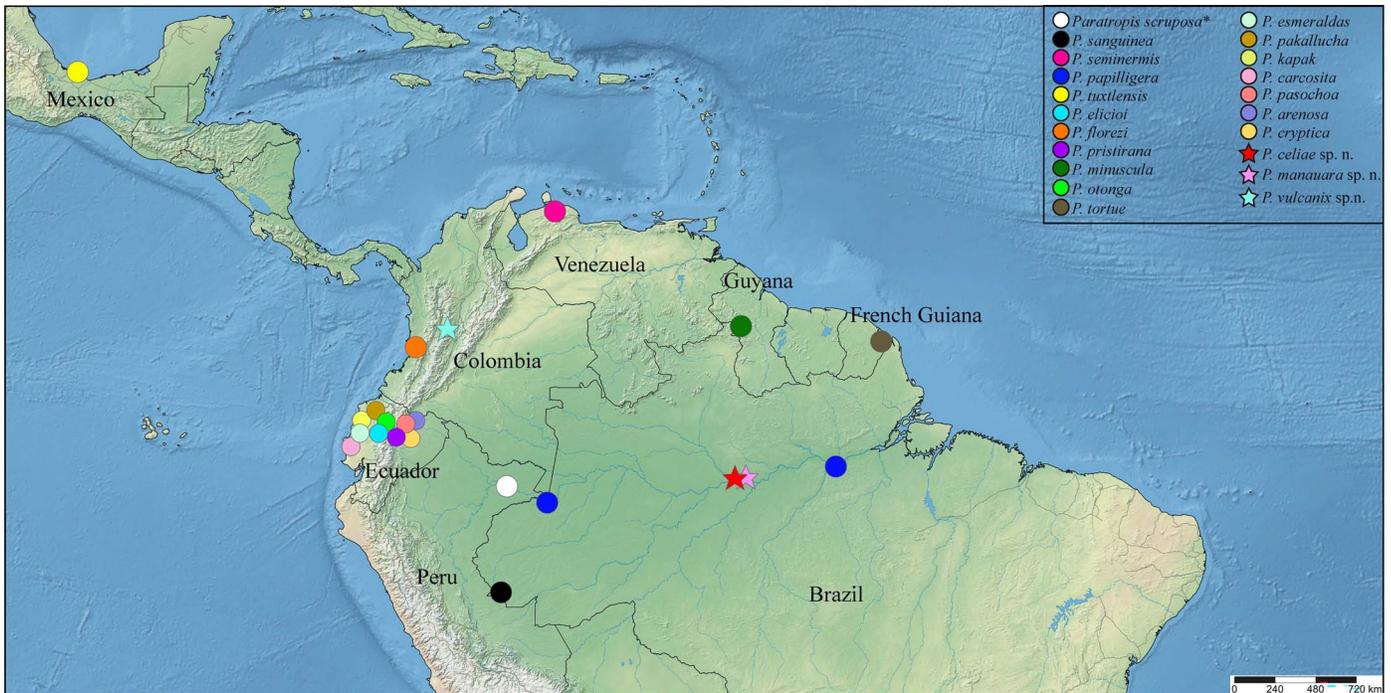


Figure 88.—Distribution records of Paratropididae.

I, whereas *P. celiae* sp. nov. and *P. manauara* sp. nov. have them. Additionally, in three of the four *Stormtropis* species the males have a spinose spur on tibia I. *Paratropis celiae* sp. nov. and *P. manauara* sp. nov. males lack a tibial spur.

As the generic diagnoses of paratropidid genera are confused, deserving new studies that could clarify their interrelationships, we describe the new species in the genus *Paratropis*, the type genus of the family. More detailed comparative studies are lacking that could produce a more stable delimitation of the genera. A cladistic analysis, for example, would aid in understanding the distribution of characters and a new classification could be proposed.

#### ACKNOWLEDGMENTS

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