European Journal of Taxonomy 1007: 87–132
https://doi.org/10.5852/ejt.2025.1007.2999

europeanjournaloftaxonomy.eu
ISSN 2118-9773
2025 ·Dupérré N. & Tapia E.

Received: 7 March 2025 • *Accepted: 23 April 2025* • *Published: 8 August 2025*

Topic editor: Magalie Castelin • *Section editor: Arnaud Henrard* • *Desk editor: Eva-Maria Levermann*

Research article

urn:lsid:zoobank.org:pub:3D9557C2-29EA-46CD-8E4C-40D22DDE4CAF

Revision of the Ecuadorian Microstigmatidae (Araneae: Mygalomorphae), with the description of six new species

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Abstract. The small mygalomorph family Microstigmatidae Roewer, 1942 from Ecuador is reviewed, and images of the blind cave species, *Speloctenizaashmolei* Gertsch, 1982 are presented. Six new species are described, and one new genus is erected: *Pseudonemesia scutata* sp. nov. (♂), *Speloctenizapampenita* sp. nov. (♂♀), *Speloctenizazuninoi* sp. nov. (♂), and *Pastaza* gen. nov., *Pastaza aureliae* gen. et sp. nov. (♀), *Pastaza roberti* gen. et sp. nov. (♂♀) and *Pastaza vegai* gen. et sp. nov. (♂). SEM images of the cuticle and tarsal organ of all genera are provided, and finally, the presently recognised diagnostic characteristics of the family are discussed.

Keywords. Diversity, tarsal organ, pustulose cuticle, scaly cuticle.

Dupérré N. & Tapia E. 2025. Revision of the Ecuadorian Microstigmatidae (Araneae: Mygalomorphae), with the description of six new species. *European Journal of Taxonomy* 1007: 87–132.
https://doi.org/10.5852/ejt.2025.1007.2999

Introduction

The small family Microstigmatidae Roewer, 1942 currently includes 38 species spread out in 11 genera, most of the specific diversity is found in Australia but the family also occurs in Asia, South Africa and in Central and South America (WSC 2025). Platnick & Forster (1982) divided the family into two subfamilies: Microstigmatinae Roewer, 1942 and Micromygalinae Platnick & Forster, 1982, later dividing the Microstigmatinae subfamily into two tribes, Pseudonemesiini Caporiacco, 1955 and Microstigmatini Roewer, 1942; Raven (1985) followed that. Pseudonemesiini originally included *Pseudonemesia* Caporiacco, 1955 while *Envia* Ott & Höfer 2004 was added later by Ott & Höfer (2004). The subfamily Microstigmatinae originally included *Microstigmata* Strand, 1932 and *Ministigmata* Raven & Platnick, 1981. The subfamily Micromygalinae originally included *Micromygale* Platnick &

Forster, 1982 from Panama, while the Brazilian genus *Tonton* Passanha, Cizauskas & Brescovit, 2019, was added in 2019 (Passanha *et al.* 2019).

Opatova *et al.* (2020) transferred *Angka* Raven & Schwendinger, 1995 from the family Cyrtaucheniidae Simon, 1889 to the Microstigmatidae; and *Ixamatus* Simon, 1887, *Kiama* Main & Mascord, 1969 and *Xamiatus* Raven, 1981 from Nemesiidae Simon, 1889 to Microstigmatidae. In 2022, Montes de Oca *et al.* redelimited the family Microstigmatidae including 11 genera, *Xenonemesia* Goloboff, 1989 was transferred from Microstigmatidae by Goloboff (1989) to Pycnothelidae Chamberlin, 1917. In an early diagnosis of the family, Raven & Platnick (1981) identified three key morphological characteristics: 1) small, oval book-lung apertures; 2) a scaly cuticle; and 3) two rows of teeth originating dorsally on the paired tarsal claws. In 1995, Goloboff revised the diagnosis to include rounded book-lung openings, in conjunction with extremely shortened posterior lateral spinnerets, a glabrous integument, and a very light to absent scopula on the anterior tarsi. The latest delimitation of the family proposed by Montes de Oca *et al.* (2022) recognized members with a diverse range of morphological traits. The early diagnostic characters do not effectively unite the group, except for the pustulose or scaly cuticle, which was first proposed by Raven & Platnick (1981), and re-asserted by Opatova *et al.* (2020). This scaly cuticle seems to be the sole morphological characteristic that establishes a connection among the family members.

Microstigmatidae are small to medium-sized mygalomorphs, ranging in total length from 0.75 to 31.00 millimetres. Their biology is not well understood, especially in the Neotropical region. According to Dippenaar-Schoeman *et al.* (2021), African Microstigmatidae are free-running spiders that are often encrusted with soil or sand particles. They are typically found in the undergrowth of humid forests, hiding under stones or damp, decaying logs (Dippenaar-Schoeman *et al.* 2006). Griswold (1985) noted that African microstigmatids do not construct webs or live in silk-lined burrows; they make minimal use of silk. In the Australian genus *Kiama*, these spiders are known to dig deep burrows – up to 63 cm – in creek banks. These burrows do not have lids and are covered with small lumps of damp earth, creating a small mound (Main & Mascord 1969). Some species of *Xamiatus* are known to construct burrows that are undecorated by leaves or twigs at their entrance. These burrows lack silk but can be expanded into a horizontal chamber that is lined with silk (Raven 1981). While in *Angka*, females and juveniles have been found under rotten logs on the forest floor, males were captured in pitfall traps. In captivity, a mature female built a burrow that was 6 cm long, again without any silk lining (Raven & Schwendinger 1995). In South America, little is known about their biology. Most specimens have been collected using Berlese samples or pitfall traps (Ott & Höfer 2004). These spiders inhabit a wide variety of environments, ranging from montane forests in the Brazilian Central Amazon to high elevations in Venezuela and the Colombian and Venezuelan Andes (Indicatti & Villarreal 2016). They have also been found in caves, such as Cueva Los Tayos in Ecuador or in iron Brazilian caves (Gertsch 1982; Passanha *et al.* 2019). In both cases, specimens were collected with reduced eyes or have completely lost their eyes. *Tonton itabirito* Passanha *et al.*, 2019 was collected in a silk shelter with a single opening (Passanha *et al.* 2019: fig. 13a) while *Spelocteniza ashmolei* Gertsch 1982 was found in silk burrows on vertical silk surfaces on a cave wall (Gertsch 1982).

Since 2019, no new species of Microstigmatidae have been described from South America. In this paper, we present images of *Spelocteniza ashmolei*, along with the description of three new species in two different genera: *Spelocteniza* and *Pseudonemesia*. Additionally, we establish a new genus, *Pastaza* gen. nov., including a further three new species. Scanning Electron Microscopes (SEM) of the cuticle and tarsal organ of all genera are included, along with a brief discussion of the morphological characters of the group.

Material and methods

Specimens were examined in 70% ethanol under a Leica M125 dissection microscope. Imaging was achieved using a custom-made BK Plus lab System by Dun, Inc. (Palmyra, PA, USA) with an integrated Canon camera (EOS 5D mark III,), a Canon macro lens (65 mm), and the Zerene stacking software (Zerene Systems LLC 2018, Richland, WA, USA). The female genitalia were dissected using a sharp entomological needle, washed in ethanol 80%, and digested with Pancreatin solution following Álvarez-Padilla & Hormiga (2007). The left male palp was dissected using forceps. All measurements are in millimetres and were made using a Leica M205A stereo microscope with Leica Application Suite X. Specimens were prepared for SEM imaging by dehydration using ethanol solution from 70% to 100% and then transferred to Hexamethyldisilazane (HMDS 99%) for three hours. Specimens were mounted on a SEM stub and imaged using a Hitachi tabletop Microscope TM4000 plus.

Maps were made with Google Earth Pro software ver. 7.3.6.9345. The acronym ECFN found in the text and on the labels refers to a Field Number (Ecuador Field Number) and is unique to every specimen.

Institutional abbreviations

DTC = Dupérré-Tapia collection, Quito, Ecuador
QCAZ = Museum of Invertebrates, Pontificia Universidad Católica, Quito, Ecuador
ZMH = Museum of Nature Hamburg, Zoology, Leibniz-Institute for the Analysis of Biodiversity Change (LIB), Hamburg, Germany

Abbreviations for morphological terms

ALE = anterior lateral eye
AME = anterior median eye
em = embolus
fe = femora
ITC = inferior tarsal claw
mt = metatarsi
pa = paraembolic apophysis
pa = patella
PLE = posterior lateral eye
PLS = posterior lateral spinnerets
PME = posterior median eye
PMS = posterior median spinnerets
STC = superior tarsal claw
sb = spermatheca base
sh = spermatheca head
sta = spermathecal stalk
ti = tibia

Results

Taxonomy

Class Arachnida Cuvier, 1812
Order Mygalomorphae Pocock, 1892

Family **Microstigmatidae** Roewer, 1942

Type genus

Microstigmata Strand, 1932 by original designation.

Composition

Angka Raven & Schwendinger, 1995, *Envia* Ott & Höfer, 2004, *Ixamatus* Simon, 1887, *Kiama* Main & Mascord, 1969, *Micromygale* Platnick & Forster, 1982, *Microstigmata* Strand, 1932, *Ministigmata* Raven & Platnick, 1981, *Pseudonemesia* Caporiacco, 1955, *Spelocteniza* Gertsch, 1982, *Tonton* Passanha, Cizauskas & Brescovit, 2019, *Xamiatus* Raven, 1981.

Diagnosis

Distinguished from other genera of Nemesoidina (sensu Montes de Oca *et al.* 2022) by the following combination of characters: tarsi not flexible (Figs 2D, 22C); inferior tarsal claw present; intercheliceral tumescence inconspicuous (Fig. 7C); pustulose or scaly cuticule present (Fig. 25C–D). Furthermore members of the subfamily Microstigmatinae can be further delineated as follows: tribe Microstigmatini are distinguished by their superior tarsal claw biseriate; pustulose leg cuticle **(**Fig. 25C–D**)**; highly elevated, smooth tarsal organ (visible under SEM) (Figs 25A, 28F, 29E) and smooth trichobothrial base (Fig. 28C); cymbium without spines (Figs 8A, 17A); those of the tribe Pseudonemesiini are distinguished by their superior tarsal claw biseriate; scaly cuticle on leg (Indicatti & Villarreal 2016: fig. 3c); low tarsal organ with concentric rings, not observed for *Envia* (Indicatti & Villarreal 2016: fig. 5a); corrugated trichobothrial base (Indicatti & Villarreal 2016: fig. 5c–d); cymbium with spines (Fig. 3A).

Members of the subfamily Micromygalinae are diagnosed by the combination of the following characters: superior tarsal claw uniserate; low tarsal organ with concentric rings (Platnick & Forster 1982: fig. 7; Passanha *et al.* 2019: fig. 1e); scaly cuticule (Platnick & Forster 1982: fig. 8); trichobothria absent on tarsi but present on metatarsi (in *Micromygale*, Platnick & Forster 1982: fig. 9) and present with corrugated bases on tarsi (in *Tonton*, Passanha *et al.* 2019: fig. 1c).

Description

Tiny to medium-sized mygalomorph spiders (0.75–31.00); 0, 2, or 8 eyes in quadrangle; cephalothorax elongated, oval, fovea variable; anterior lobe of maxillae not well-developed; spinnerets short (only two in *Ministigmata*, with two vestigial in *Pseudonemesia*); legs with pustulose or scaly cuticule; leg tarsi with three claws; tarsi and / or metatarsi with filiform trichobothria; tarsal organ elevated and smooth or low with concentric ridges.

Distribution

Australia, Central and South America, South Africa and Thailand.

Subfamily Microstigmatinae Roewer, 1942

Genus ***Pseudonemesia*** Caporiacco, 1955

Type species

Pseudonemesia parva Caporiacco, 1955 by monotypy.

Composition

Pseudonemesia kochalkai Raven & Platnick, 1981, *P. parva* Caporiacco, 1955, *P. tabiskey* Indicatti & Villareal, 2016 and *P. scutata* sp. nov.

Diagnosis

For a complete diagnosis see Indicatti & Villarreal (2016). *Pseudonemesia* is differentiated from *Spelocteniza* and *Pastaza* gen. nov. by their tarsal organ being semi-flat, about two fifths away from apex with concentric ridges (see Raven & Platnick 1981: figs 31–32; Indicatti & Villarreal 2016: fig. 5a,

d) while in *Speloctenizа* and *Pastaza* gen. nov. the tarsal organ is highly elevated, situated at the apex of tarsus (Figs 25A, 29E); presence of clavate setae on abdomen (Indicatti & Villarreal 2016: figs 6b, 9b) absent in the other two genera. Furthermore, males of *Pseudonemesia* differ from those of *Speloctenizа* and *Pastaza* gen. nov. by the presence of a dorsal abdominal scutum (Fig. 2C, arrow), and a unique large clasping spur accompanied by short and apically rounded spine (Fig. 2D, arrow); both characters are absent in the males of the latter genera (Figs 6A, 7D, 15A, 16C).

Distribution

Venezuela, Colombia and Ecuador.

Pseudonemesia scutata sp. nov.
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Figs 1–3, 30

Diagnosis

The male most resembles those of *P. tabiskey* by the presence of one short and apically rounded spine located retrolaterally on tibia I (Fig. 2D), but can be distinguished by the male tibia I with one retrolateral spine (Fig. 2D), two in the latter (Indicatti & Villarreal 2016: fig. 1g); palpal bulb elongated with short, straight embolus (Fig. 3C–E), palpal bulb oval, with longer, curved embolus in the latter (Indicatti & Villarreal 2016: fig. 1a–e).

Fig. 1. *Pseudonemesia scutata* sp. nov., ♂, holotype (ECFN 6985; QCAZ). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. Scale bars: 0.5 mm.

Fig. 2. *Pseudonemesia scutata* sp. nov., ♂, holotype (ECFN 6985; QCAZ). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Abdomen, dorsal view (arrow points to scutum). **D**. Leg I, prolateral view (arrow points to rounded spine). Scale bars: 0.5 mm.

Etymology

The specific name is a Latin adjective in reference of the presence of a dorsal abdominal scutum in males.

Type material

Holotype

ECUADOR • ♂; Napo Province, Tena, Colonso Chalupas Natural Reserve; 0°54′14″ S, 77°39′48″ W; 1358 m a.s.l.; 2–9 Mar. 2020; E. Tapia, N. Dupérré and A. Tapia leg.; pitfall; ECFN 6985; QCAZ.

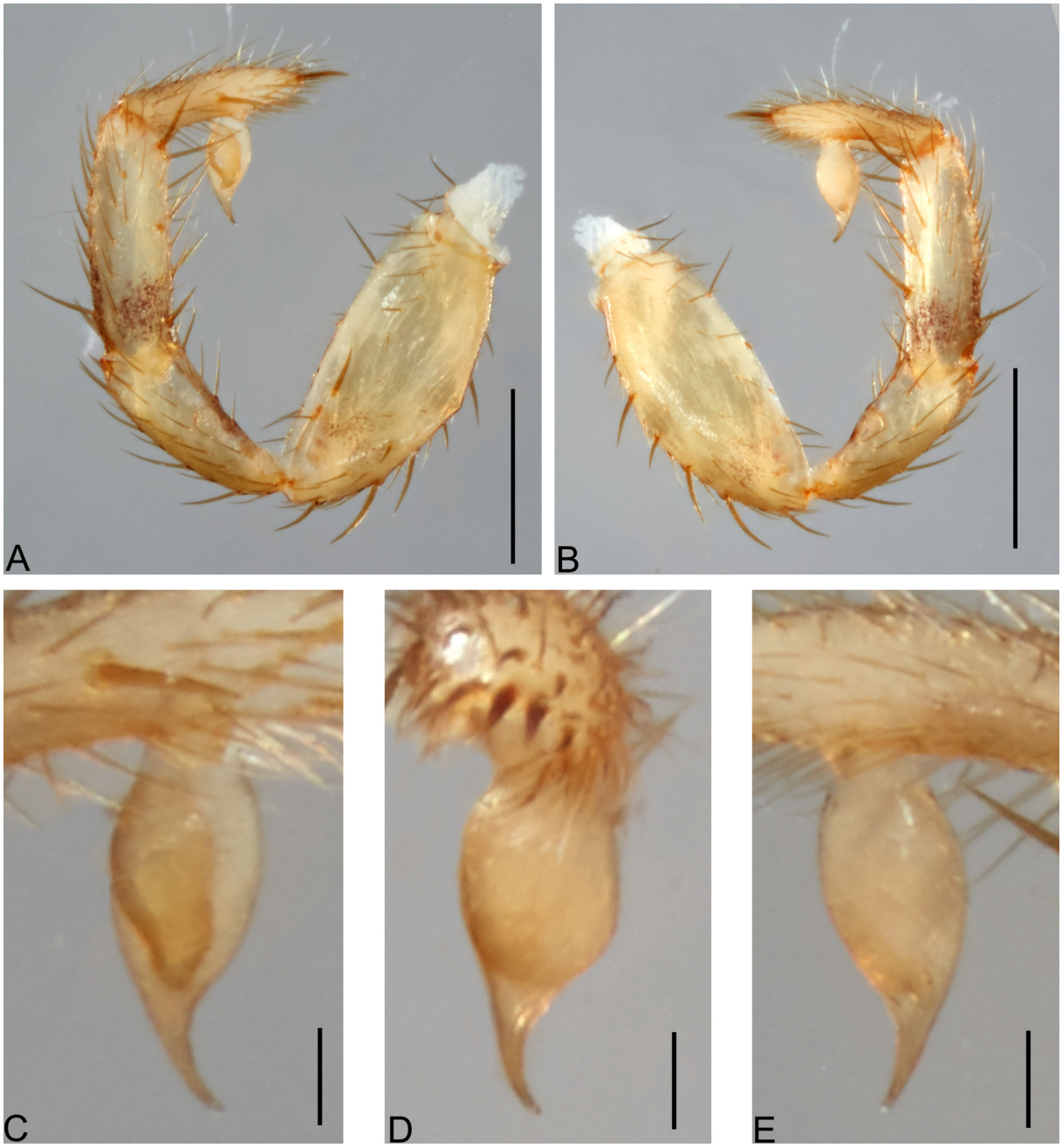

Fig. 3. *Pseudonemesia scutata* sp. nov., ♂, holotype (ECFN 6985; QCAZ). **A**. Palp, prolateral view. **B**. Palp, retrolateral view. **C**. Bulb, prolateral view. **D**. Bulb, ventral view **E**. Bulb, retrolateral view. Scale bars: A–B = 0.5 mm; C–E = 0.1 mm.

Description

Male (holotype)

Measurements. Total length: 2.69; carapace length: 1.40; carapace width: 1.19; abdomen length: 1.29.

Cephalothorax. Carapace oval, yellow with dark bands on lateral side and one dark band centrally from the eye quadrangle to the fovea; pars cephalica and pars thoracica flat, fovea straight (Fig. 2A). Labium yellow without cuspules. Maxillae yellow without cuspules (Fig. 2B); serrula not observed. Sternum yellow, longer than wide (0.65 length, 0.51 width) (Fig. 2B). Eight eyes in two rows; AME 0.05, ALE 0.1, PME 0.05, PLE 0.09, PME–PME 0.07; ocular quadrangle trapezoidal (0.25 anterior, 0.31 posterior, 0.15 high).

Chelicerae. Light yellow; with three promarginal teeth, eight intercheliceral basal denticles; rastellum absent.

Legs. Light yellow with dark gray-brownish apically on femora, basally on tibiae, metatarsi and tarsi I–II, tarsi not flexible; scopula absent on all tarsi; femur I incrassate, tibia I with large clasping spur and small rounded spine (Fig. 2D, arrow points to rounded spine); STC with two rows, each of 9–12 teeth on tarsi I–II; 3–5 on tarsi III–IV, ITC well developed on all legs. Leg measurements: I 3.49 (1.04/0.56/0.82/0.59/0.48); II 3.11 (0.82/0.52/0.62/0.71/0.44); III 2.98 (0.70/0.47/0.62/0.66/0.53); IV 4.57 (1.05/0.63/0.99/1.23/0.67); leg formula 4321. Leg spination (spines present on all segment except tarsi): I fe d1-1-1-1-1, pa 0, ti v1-1(clasping spine), mt v2(apical); II fe d1-1-1-1-1, pa 0, ti v1-1-3(apical), mt v1-2-2(apical), p1; III fe d2-1-3-3-1-1, p1-1, r1, pa d1, p1, ti v1-1-3(apical), p1, r1, mt v2-3(apical), p1-1, r1-1, d1-2-2; IV fe d1-1-1-1-2-1, pa d1, p1, r1, ti d2-1-1, p1-1, r1-1, v1-1-3(apical), mt d1-2, p1-1, r 1-1, v2-2-2(apical).

Abdomen. Oval, dorsally with apical constriction and small anterior brown scutum, light yellow with dark gray-brownish pattern; without clavate setae (Fig. 2C). Spinnerets PMS not visible, two vestigial PLS, short.

Genitalia. Palpal tibia (0.56 length, 0.18 width); cymbium with one prolateral and two apical spines (Fig. 3A–B); bulb elongated, with short truncated embolus (Fig. 3C–E).

Female

Unknown.

Natural history

The only specimen was collected in a pitfall trap at 1358 m a.s.l. in a low montane evergreen forest of the Eastern Cordillera (BsBn01) (Santiana *et al.* 2013b).

Distribution

Only found at the type locality in Napo Province.

Genus ***Spelocteniza*** Gertsch, 1982

Type species

Spelocteniza ashmolei Gertsch, 1982 by monotypy.

Composition

Spelocteniza ashmolei Gertsch, 1982, *S. pampenita* sp. nov. and *S. zuninoi* sp. nov.

Diagnosis

Specocteniza is distinguished from *Envia* and *Pseudonemesia* by the absence of a scutum in the male (Fig. 6A); the absence of a large subapical clasping spine in males (Figs 7D, 11C) and leg cuticule pustulose (Figs 25D, 28C), while a scutum is present in males (Fig. 2C; see Ott & Höffer 2004: fig. 2); large subapical clasping spine present in males (Fig. 2D, see Ott & Höffer 2004: figs 4–5) and scaly cuticule (Miglio & Bonaldo 2011: fig.17; Indicatti &Villareal 2016: fig. 3d). From *Ministigmata*, *Specocteniza* is distinguished by the presence of four spinnerets (Fig. 27B), two in the former (Raven & Platnick 1981); from *Tonton* by the leg cuticule being pustulose, not pustulose in the latter (Passanha *et al.* 2019: fig. 2f), and the tarsal organ strongly elevated (Figs 25A, 28F) low with concentric ridges in the latter (Passanha *et al.* 2019: fig. 1e). From *Pastaza* gen. nov. males are distinguished by their palp bulb with paraembolic apophysis (Figs 8D, 12D), absent in the latter (Figs 17D, 23D); females are distinguished by their narrow spermathecal bases (Figs 5C, 10C) whereas they are wide in the latter (Figs 14E, 20E).

Distribution

Ecuador.

Specocteniza ashmolei Gertsch, 1982
Figs 4–5, 24–25, 30

Diagnosis

Females are distinguished from those of all species by their evanescent eyes (Figs 4A, 5A), internal genitalia with two spermathecal heads on narrow bases (Fig. 5C).

Type material

Holotype

ECUADOR • ♀; Morona Santiago Province, Shovel Pot Trapdoor Chamber of cave at Los Tayos; 3°11′ S, 78°12′ W; 26 July 1976; N.P. Ashmole leg; AMNH_IZC 00357161; AMNH.

Description

See Gertsch (1982). Gertsch stated the rastellum having six heavy, curved, socketed spines along inside half “, we observed two large spines, four smaller setae. Tarsal organ highly elevated, smooth at apex of tarsi (Figs 24D, 25A–B), leg cuticle pustulose (Fig. 25D).

Natural history

The female was collected in a trapdoor nest on the vertical silk surface on a wall (Gertsch 1982).

Distribution

Only known at the type locality in Morona Santiago.

Specocteniza pampenita sp. nov.
urn:lsid:zoobank.org:act:A44F6FA1-E4EF-4C6A-961D-41A144249DA5
Figs 6–10, 26–28, 29A, 30

Diagnosis

Males are distinguished from those of *S. zuninoi* sp. nov. by the oval palpal bulb, sinuous embolus and long and curved paraembolic apophysis (Fig. 8C–E), while the palpal bulb is elongated oval, curved embolus and short paraembolic apophysis in the latter (Fig. 12C–E). Females are distinguished from

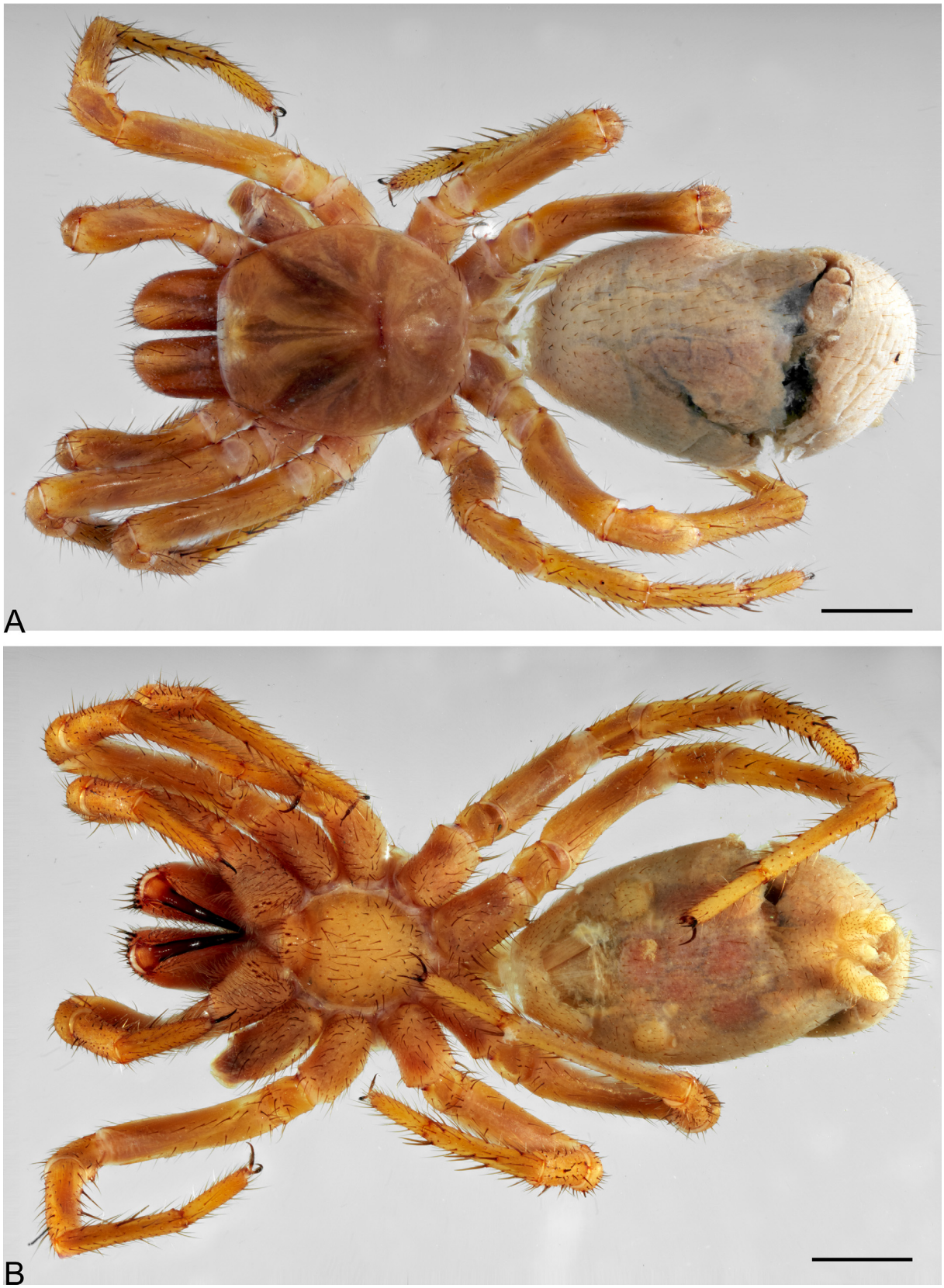

Fig. 4. *Speloctenizaashmolei* Gertsch, 1982, ♀, holotype (AMNH_IZC 00357161; AMNH). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. Scale bars: 1.0 mm.

those of *S. ashmolei* by their internal genitalia with elongated, sinuous spermathecal stalks and one spermathecal head (Fig. 10C), having short spermathecal stalks and two spermathecal heads in the latter (Fig. 5C).

Etymology

The specific epithet is a noun in apposition, invariable, derived from the language of the inhabitants of San Francisco de las Pampas.

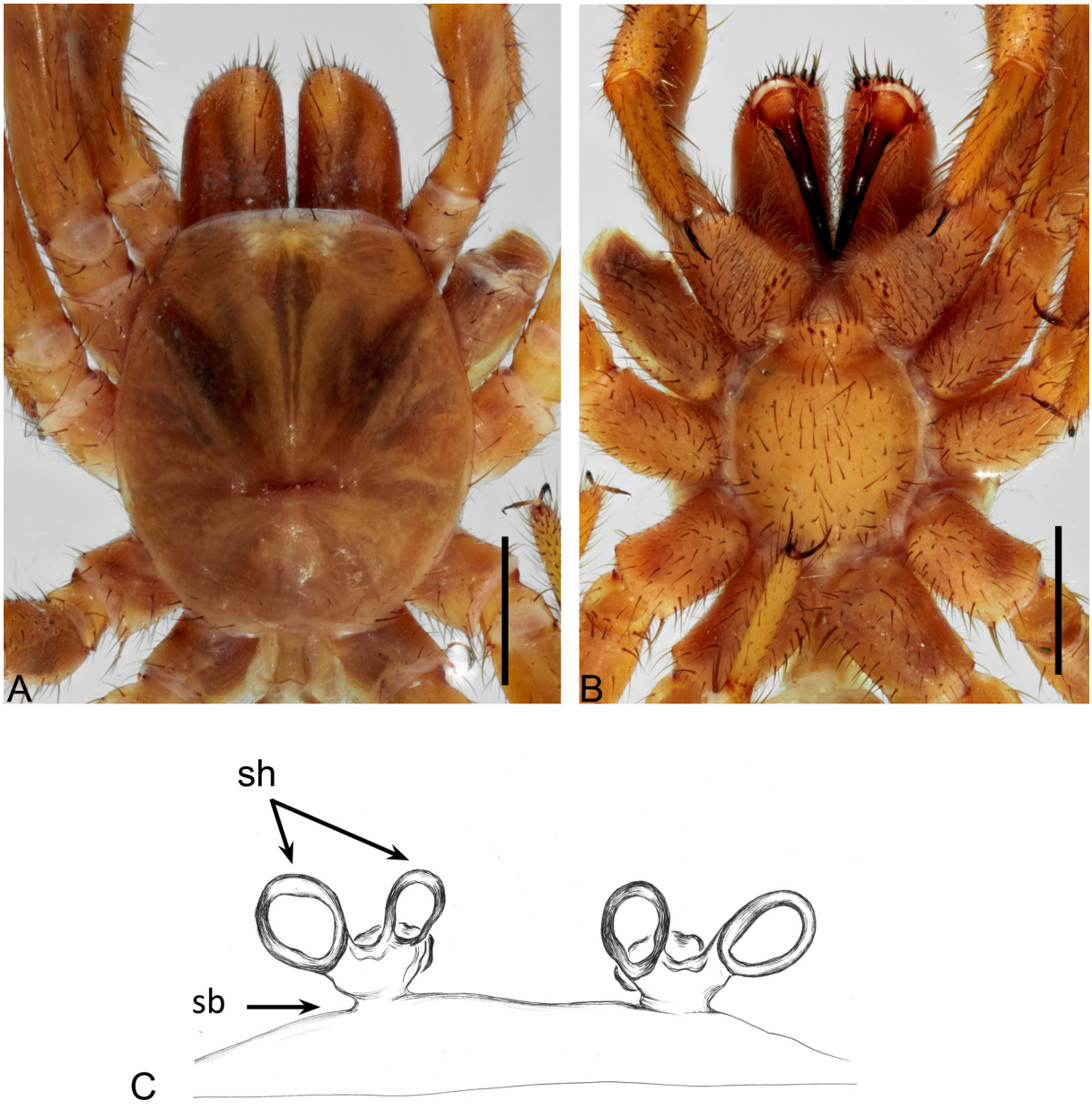

Fig. 5. *Spelocteniza ashmolei* Gertsch, 1982, ♀, holotype (AMNH_IZC 00357161; AMNH). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Internal genitalia, dorsal view. Abbreviations: see Material and methods. Scale bars: 1.0 mm.

Fig. 6. *Speloctenizа pampenita* sp. nov., ♂, holotype (ECFN 11665; QCAZ). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. Scale bars: 1.0 mm.

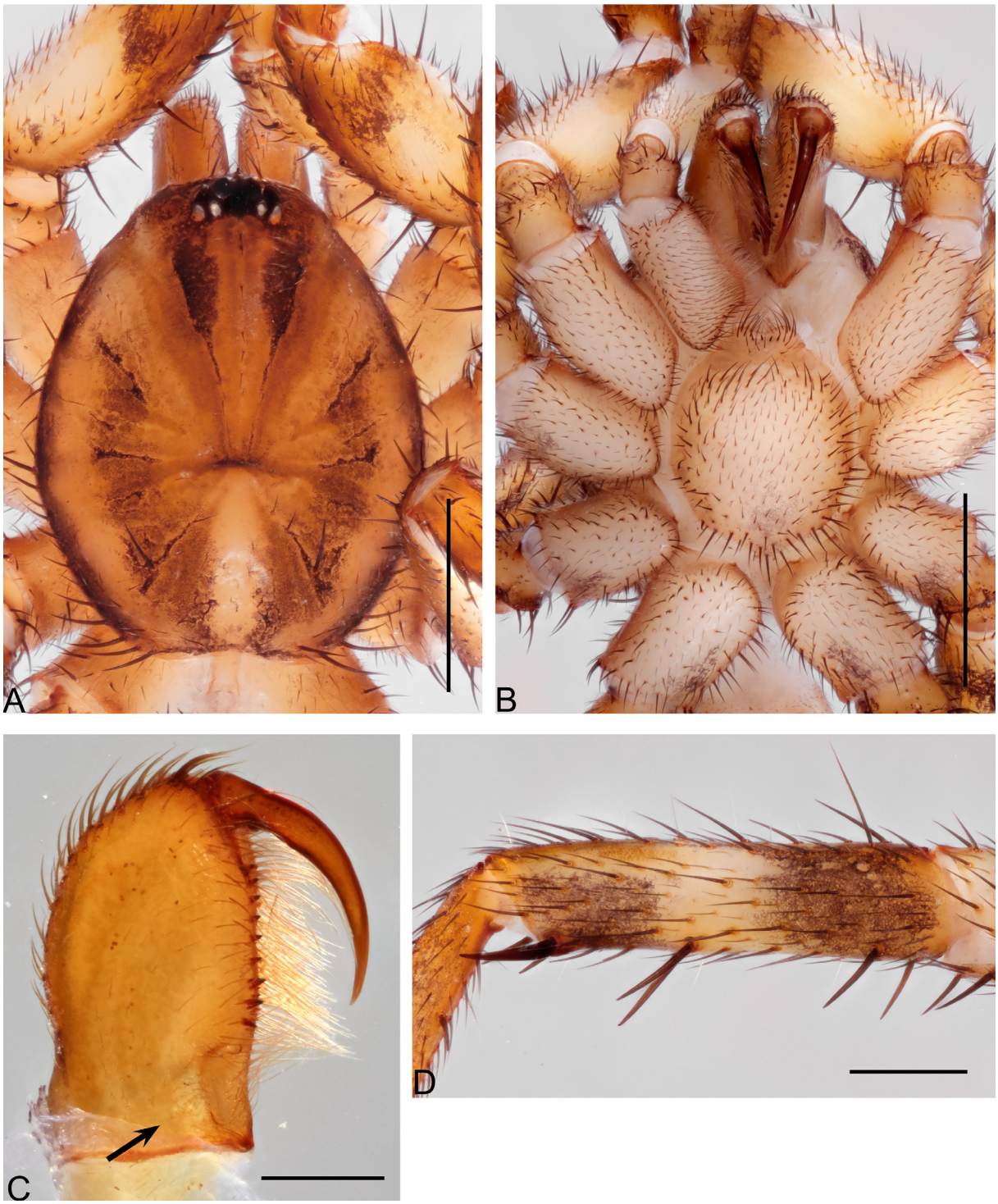

Fig. 7. *Spelocteniza pampenita* sp. nov., ♂, holotype (ECFN 11665; QCAZ). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Chelicerae (arrow points to intercheliceral tumescence). **D**. Leg I, retrolateral view. Scale bars: A–B = 1.0 mm; C–D = 0.5 mm.

Type material

Holotype

ECUADOR • ♂; Cotopaxi Province, San Franciso de las Pampas, Pristirana Biological Reserve; 0°25′28″ S, 78°57′34″ W; 1521 m a.s.l., 26 Feb.–5 Mar. 2019; E. Tapia and Faml. Tapia Caisaguano leg.; pitfall trap; ECFN 11665; QCAZ.

Paratypes

ECUADOR • 1 ♂; same data as for holotype; ECFN 1535; ZMH-A0030710; ZMH • 1 ♂; same data as for holotype; ECFN 11666; QCAZ • 1 ♂; same data as for holotype; ECFN 11667; ZMH-A0030709; ZMH • 1 ♂, same data as for holotype; ECFN 11235; DTC • 1 ♂; same data as for holotype; ECFN 11234; QCAZ • 1 ♂, 3 juvs; same data as for holotype; 12 Jan. 2023; pitfall trap; ECFN 10234; QCAZ • 1 ♀; same data as for preeceding; 15 Jan 2023; ECFN 10158; QCAZ.

Description

Male (holotype)

Measurements. Total length: 5.17; carapace length: 2.79; carapace width: 2.42; abdomen length: 2.38.

Cephalothorax. Carapace oval, light yellow-orange; pars cephalica flat, with black marking, pars thoracica sloping with black markings along radiating line and margin; fovea straight; with pair of large setae on pars cephalica and along posterior margin (Figs 7A, 26A). Labium light yellow, margin V-shaped, with four elongated cuspules (Fig. 7B). Maxillae light beige, with three elongated cuspules; anterior lobe small (Figs 7B, 26E–F); serrula present. Sternum light beige with basal median dark mark; oval, wider than long (1.15 length, 1.26 width); with three small rounded sigilla along margin (Fig. 7B). Eight eyes in two rows: AME 0.12, ALE 0.15, PLE 0.12, PME 0.05, PME–PME 0.20; ocular quadrangle rectangular (0.48, anterior, 0.48 posterior, 0.24 high) (Fig. 7A).

Chelicerae. Orange, rastellum absent (Fig. 26B); with nine promarginal teeth, 16 intermarginal denticles; intercheliceral tumescence inconspicuous with few setae (Figs 7C, 26C).

Legs. Light yellow-beige with dark bands apically on femora, laterally on patellae and apically and basally on metatarsi (Fig. 6A–B); pustulose (Fig. 28C, F). Leg measurements: I 8.08 (2.32/1.22/1.87/1.46/1.21); II 7.27 (2.00/1.03/1.65/1.42/1.17); III 6.69 (1.74/0.89/1.37/1.71/0.98); IV 10.13 (2.5/1.23/2.27/2.79/1.34); leg formula 4123. Leg spination (spines on all segment except tarsi): I fe d1-1-1-1-1-1, pa d1, v2, ti p1-1, v2-1-2-2(apical), mt p1, v1-1-2(apical); II fe d1-1-1-1-1-1, pat d1, ti p1-1, v2-2-3 (apical), mt p1, v2-2-2(apical); III fe d1-2-3-3-1, pa d1, p2, r1, ti d1-1, p1-1, r1, v2-2-3 (apical), mt d2-2-1, p1-1-1-1, r1, v2-2-3(apical); IV fe 1-1-1-1-2d, pa 1r, 1p, ti d1-1-1-2, p1-1, r1-1, v2-2-3(apical), mt d1-1-1-2, p1, r1, v2-1-3-3(apical). Tarsi with filiform trichobothria with smooth trichobothrial base (Fig. 28C); tarsal organ highly elevated and smooth (Fig. 28E–F); tarsal claw biserrated with 6–8 teeth, ITC present on all legs. Male tibial clasping spur is a large spine; sparse scopula on tarsi I–II, sparse apical (25%) scopula on metatarsi I–II, absent on tarsi and metatarsi III–IV.

Abdomen. Oval, light beige with dark gray meshy pattern medially; ventrally light beige with dark gray meshy pattern on lower half. Four spinnerets, PMS short with one apical spigot, PLS short with numerous spigots (Figs 6A–B, 27B–E) on median and apical segments.

Genitalia. Palpal tibia (1.15 length, 0.43 width) (Fig. 7F); cymbium without spines (Fig. 8A–B); bulb oval, with large, rounded tegular heel (Fig. 8C, arrow); embolus sinuous, with long, wide and curved paraembolic apophysis (Figs 8C–E, 28A–B).

Fig. 8. *Spelocteniza pampenita* sp. nov., ♂, holotype (ECFN 11665; QCAZ). **A**. Palp, prolateral view. **B**. Palp, retrolateral view. **C**. Bulb, prolateral view (arrow points to tegular heel). **D**. Bulb, ventral view. **E**. Bulb, retrolateral view. Abbreviations: see Material and methods. Scale bars: A–B = 0.5 mm; C–E = 0.1 mm.

Female (paratype ECFN 10158)

MEASUREMENTS. Total length: 4.35; carapace length: 2.20; carapace width: 1.81; abdomen length: 2.15.

Fig. 9. *Speloctenizа pampenita* sp. nov., ♀, paratype (ECFN 10158; QCAZ). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. Scale bars: 1.0 mm.

Cephalothorax. Carapace yellow; pars cephalica arched, with black markings; pars thoracica sloping with black markings along radiating line and margin; fovea straight (Fig. 10A). Labium orange with three elongated cuspules (Fig. 10B). Maxillae orange with six elongated cuspules; anterior lobe small (Fig. 10B); serrula present. Sternum as in male (1.03 length, 1.10 width) (Fig. 10B). Eight eyes in two rows: AME 0.09, ALE 0.14, PLE 0.07, PME 0.05, PME–PME 0.19; ocular quadrangle rectangular (0.44, anterior, 0.45 posterior, 0.21 high).

Chelicerae. Orange; rastellum present with two spines (Fig. 10B); with eight promarginal teeth and 15 intermarginal denticles.

Legs. Coloration as in male; scopula absent; filiform trichobothria present on all tarsi; tarsi with STC with 5–7 teeth on each edge, ITC present on all legs; palpal tibia claw with five teeth; tarsal organ highly

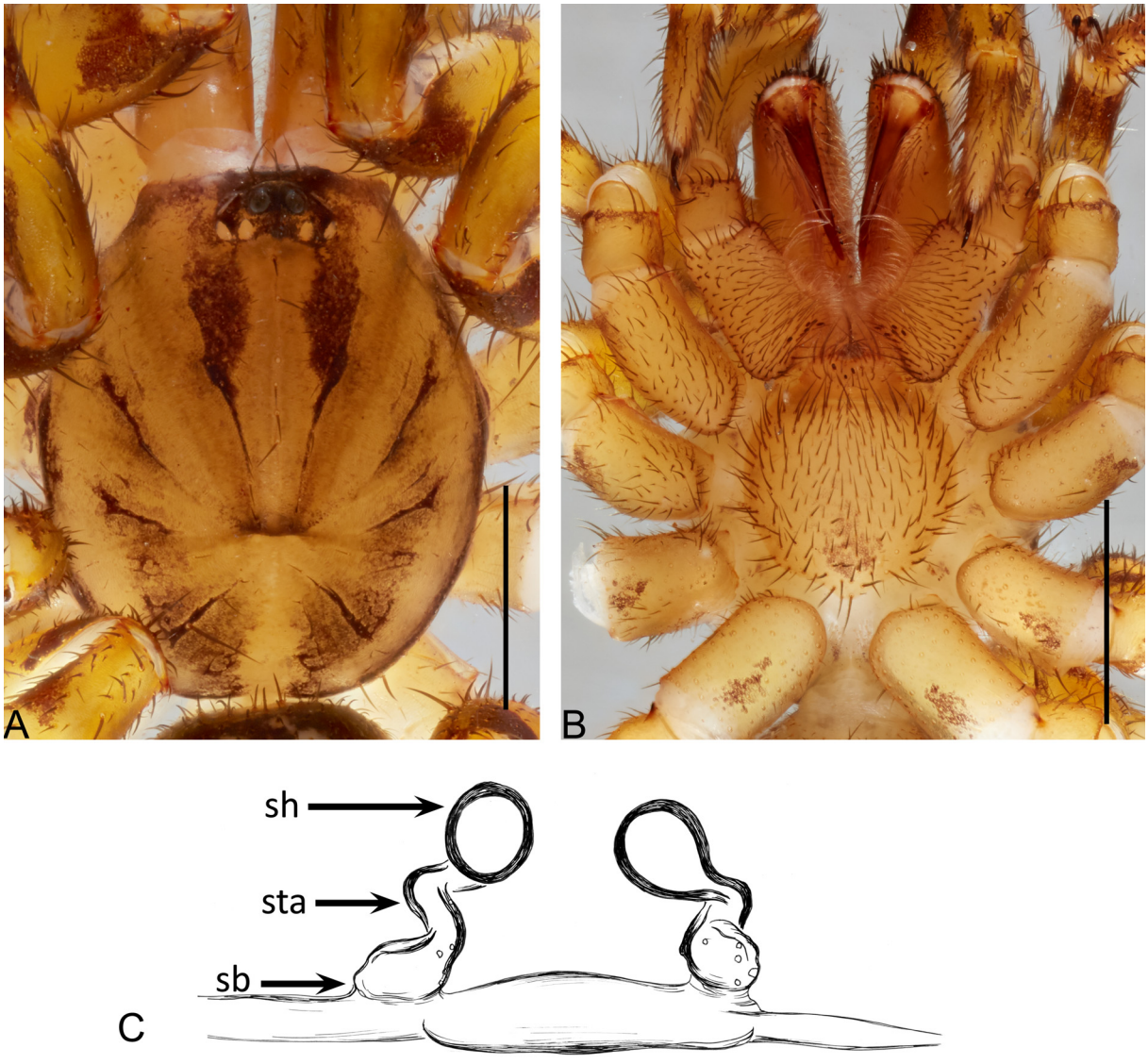

Fig. 10. *Spelocteniza pampenita* sp. nov., ♀, paratype (ECFN 10158; QCAZ). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Internal genitalia, dorsal view. Abbreviations: see Material and methods. Scale bars: A–B = 1.0 mm.

elevated (observed under light microscope). Leg measurements: I 5.31 (1.61/0.82/1.30/0.85/0.73); II 4.78 (1.41/0.80/1,01/0.84/0.72); III 3.99 (1.05/0.63/0.81/0.82/0.68); IV 6.27 (1.53/0.82/1.37/1.59/0.96); leg formula 4123. Leg spination (spines present on all segments except tarsi): I fe d1-1-1-1-1, pa0, ti v1-1, mt v1-2-2(apical); II fe d1-1-1-1-1-1, pa0, ti v1, mt v2-2-2(apical); III fe d1-1-1-1, pa p1-1, ti d1, p1-1, v2-3 (apical), mt d1-1-2, p1-1, r1, v1-2-3(apical); IV fe d1-1-1-1, pa0, ti d1-1, p1-1, r1, v-1-1-3(apical), mt d1-1-1, p1-1, r1, v1-2-2-3(apical).

Abdomen. Oval, dorsally light beige with dark gray meshy pattern; ventrally light beige with dark gray meshy pattern in lower half (Fig. 9A–B); four spinnerets, PMS and PLS short.

Genitalia. Internal genitalia visible through integument (Fig. 9B); spermathecal bases narrow, with elongated sinuous stalks, and small oval spermathecal heads (Fig. 10C).

Natural history

Specimens were collected in a pitfall trap at 1521 m a.s.l. in a low evergreen montane forest of the Western Cordillera (BsBn04) (Iglesias *et al.* 2013b).

Distribution

Known only from the type locality in Cotopaxi Province.

Speloctenizа zuninoi sp. nov.
urn:lsid:zoobank.org:act:E06CF868-786C-4358-BC75-CDAC7ABAAA2C
Figs 11–12, 30

Diagnosis

Males closely resemble those of *S. pampenita* sp. nov. but can be distinguished by the palpal bulb elongated oval, curved embolus and short paraembolic apophysis (Fig. 12C–E); while the palpal bulb is oval, the embolus sinuous and the paraembolic apophysis long in the latter (Fig. 8C–E).

Etymology

The specific epithet is a patronym in honor of Mario Zunino, Italian entomologist, in recognition of his studies on systematics, phylogeny of scarab beetles and support to the OTONGA foundation.

Type material

Holotype

ECUADOR • ♂; Cotopaxi Province, OTONGA Biological Reserve; 0°25′17″ S, 79°00′48″ W; 2225 m a.s.l.; 19 Sep.–2 Oct. 2014; E. Tapia, C. Tapia and N. Dupérré leg.; ECFN 11673; QCAZ.

Description

Male (holotype)

Measurements. Carapace length: 2.62; carapace width: 2.08; abdomen length: missing.

Cephalothorax. Carapace orange, oval; pars cephalica flat, pars thoracica sloping; fovea straight (Fig. 11A). Labium yellow with V-shaped margin; with four elongated cuspules (Fig. 11B). Maxillae with 3–7 elongated cuspules; anterior lobe small (Fig. 11B); serrula present. Sternum rounded (1.19 length, 1.22 width); with three oval sigilla along margin (Fig. 11B). Eight eyes in two rows: AME 0.1, ALE 0.1, PLE 0.09, PME 0.06, PME–PME 0.34; ocular quadrangle rectangular (0.47 anterior, 0.48 posterior, 0.23 high) (Fig. 11A).

CHELICERAE. Orange, rastellum absent; with 10 promarginal teeth, 12 intermarginal denticles; intercheliceral tumescence inconspicuous.

LEGS. Light orange with dark bands apically on femora, laterally on patellae and apically and basally on metatarsi. Leg measurements: I 7.46 (1.93/1.14/1.74/1.49/1.16); II 7.07 (1.94/1.07/1.53/1.41/1.12); III 6.44 (1.75/0.70/1.30/1.61/1.08); missing. Leg spination (spines on all segments except tarsi): I fe d1-1-1-

Fig. 11. *Spelocteniza zuninoi* sp. nov., ♂, holotype (ECFN 11673; QCAZ). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Leg I, retrolateral view. Scale bars: A–B = 1.0 mm; C = 0.5 mm.

1-1-1, pa 0, ti p1-1, v2-2-3(apical), mt p1, v1-1-2(apical); II fe d1-1-1-1-1, pa 0, ti p1-1, v2-2-3 (apical), mt p1,v1-2-2(apical); III fe d1-1-2; pa d1, p1, r1, ti d1, p1-1, r1, v2-2-3 (apical), mt d2-2-1, p1-1-1-1, r1, v2-2-3(apical); IV missing. Tarsi with filiform trichobothria, tarsal organ highly elevated and smooth (observed under light microscope); tarsal claw biserrated with 5–8 teeth on each edge, ITC present on all leg. Male tibial clasping spur is a large spine (Fig. 11C); sparse scopula on tarsi I–II, sparse apical (25%) scopula on metatarsi I–II, absent on tarsi and metatarsi III–IV.

Fig. 12. *Spelocteniza zuninoi* sp. nov., ♂, holotype (ECFN 11673; QCAZ). **A**. Palp, prolateral view. **B**. Palp, retrolateral view. **C**. Bulb, prolateral view (arrow points to tegular heel). **D**. Bulb, ventral view. **E**. Bulb, retrolateral view. Abbreviations: see Material and methods. Scale bars: A–B = 0.5 mm; C–E = 0.1 mm.

Abdomen. Missing.

Genitalia. Palpal tibia (1.0 length, 0.36 width); cymbium without spines (Fig. 12A–B); bulb elongated oval; with large tegular heel; embolus sinuous, with short, curved paraembolic apophysis (Fig. 12C–E).

Female

Unknown.

Natural history

The only male was collected in a pitfall trap at 2225 m a.s.l. in the evergreen montane forest of the Western Cordillera (BsMn03) (Iglesias *et al.* 2013a)**.**

Distribution

Known only from the type locality in Cotopaxi Province.

Pastaza gen. nov.

urn:lsid:zoobank.org:act:6B00485F-29BB-498B-B62D-D25D14BB2829

Type species

Pastaza aureliae sp. nov.

Diagnosis

Members of the genus *Pastaza* gen. nov. most resemble those of *Speloctenizа* but are distinguished by the male palpal bulb without a paraembolic apophysis (Figs 17D, 23D), present in the latter (Figs 8D, 12D), and females with spermathecae on wide bases (Figs 14C–E, 20C–E) while in the latter, spermathecae are on narrow bases (Figs 5C, 10C). From *Pseudonemesia*, *Envia* and *Tonton*, they differ by the tarsal organ being highly elevated, smooth (Fig. 29A, C–F) and pustulose cuticle (Fig. 29B–F); while in the latter, the tarsal organ is low with concentric ridges and scaly cuticle (tarsal organ unknown for *Envia*); from *Ministigmata*, by the presence of four spinnerets, two in the latter (Raven & Platnick 1981).

Etymology

The generic epithet is a noun (invariable) referring to Pastaza Province where the type species was collected. The gender is feminine.

Composition

Pastaza aureliae gen. et sp. nov., *Pastaza roberti* gen. et sp. nov., and *Pastaza vegai* gen. et sp. nov.

Description

Measurements. Total length: 7.78–13.31.

Cephalothorax. Carapace elongated-oval; pars cephalica flat to slightly arched, pars thoracica sloping; fovea straight to slightly recurved (Figs 14A, 20A).

Chelicerae. Without rastellum; with 10–12 teeth, 9–22 intermarginal denticles. Labium margin V-shaped with 4–17 cuspules; maxillae rectangular with 9–18 cuspules, anterior lobe small (Figs. 14B, 22B); serrula present; intercheliceral tumescense inconspicuous. Eight eyes in two rows, ocular quadrangle rectangular (1.8 × as long as wide) (Figs 14A, 20A). Sternum longer than wide in males (Figs 16B, 22B), slightly wider than long in females (Figs 14B, 20B), with three marginal, oval sigilla, anterior pair inconspicuous.

Legs. Leg formula 4123; leg spines present on all segments except tarsi; male tibia I with apical clasping spur (Figs 16C, 22C); male with sparse scopula on tarsi I-III and metatarsi I–II; females without scopula; filiform trichobothria present on all tarsi (Fig. 29B); tarsi with STC with teeth 3–8 in each per row, ITC present on all legs; tarsal organ highly elevated, smooth (Fig. 29A, C–F).

Abdomen. Oval, without scutum or clavate setae (Figs 13A, 15A). Four spinnerets, PMS and PLS short (Fig. 19B).

Genitalia. Male palpal cymbium without spines (Figs 17A, 23A); bulb with acute tegular heel (Figs 17C, 23C); embolus with keels and ridges (Figs 17C–E, 23C–E). Female internal genitalia with spermathecae on wide base, spermathecal heads oval to mushroom-shaped (Figs 14C–E, 20C–E).

Distribution

Ecuador, Amazon region.

Pastaza aureliae gen. et sp. nov.
urn:lsid:zoobank.org:act:2D1619F8-6B8C-4801-AFCE-B493D26103E7
Figs 13–14, 29B–D, 30

Diagnosis

Females are distinguished from those of *P. roberti* gen. et sp. nov. by their internal genitalia with spermathecae being closer together and separated by their diameter, on short stalks (Fig. 14C–E) compared to spermathecae separated by 2 × their diameter in the latter and on elongated stalks (Fig. 20C–E).

Etymology

The specific epithet is a matronym in honor of Anabelle Aurelia Tapia, one of the collectors of the type specimen.

Type material

Holotype

ECUADOR • ♀; Pastaza Province, Via Puyo – Macas, Communidad Chuwitayo 7 km via communidad Chapintza, Propriedad del Sr. Luis Caniras, Cueva de los tallos; 642 m a.s.l.; 5 Oct. 2021; E. Tapia and A. Tapia leg.; hand collected inside cave, in burrow with lid; ECFN 7948; QCAZ.

Paratypes

ECUADOR • 1 ♀; same data as for holotype; ECFN 8288; ZMH-A0030711; ZMH • 1 ♀; same data as for holotype; ECFN 8287; QCAZ • 1 ♀, same data as for holotype; ECFN 8289; ZMH-A0030712; ZMH • 1 ♀, same data as for holotype; ECFN 7949; DTC.

Other material examined

ECUADOR • 1 ♀juv., same data as for holotype; ECFN 8246; QCAZ • 1 ♀ (juv.), same data as for holotype; ECFN 8299; ZMH-A0030713; ZMH.

Description

Female (holotype)

Measurements. Total length: 12.70; carapace length: 6.24; carapace width: 4.95; abdomen length: 6.55.

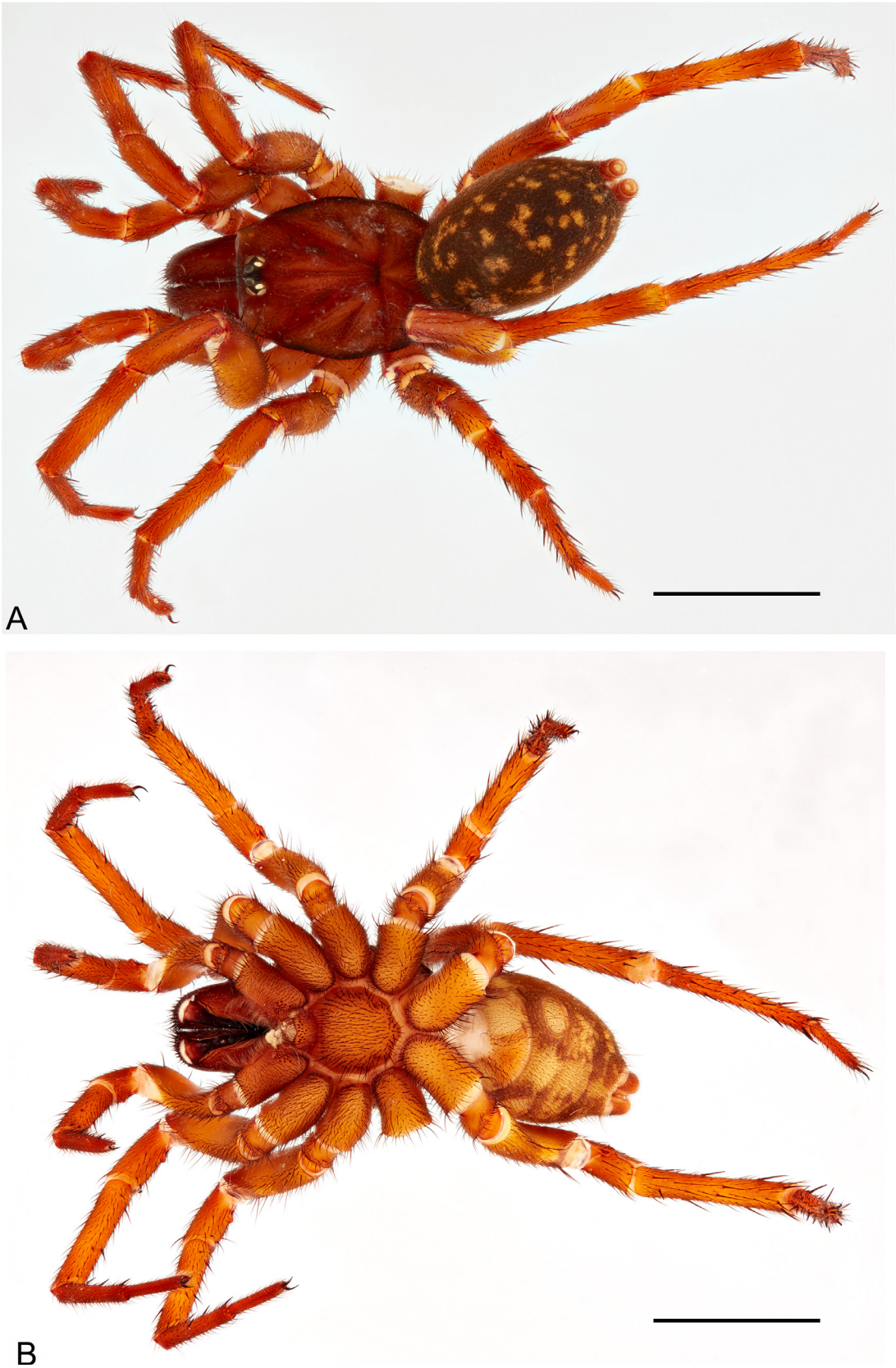

Fig. 13. *Pastaza aureliae* gen. et sp. nov., ♀, holotype (ECFN 7948; QCAZ). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. Scale bars: 5.0 mm.

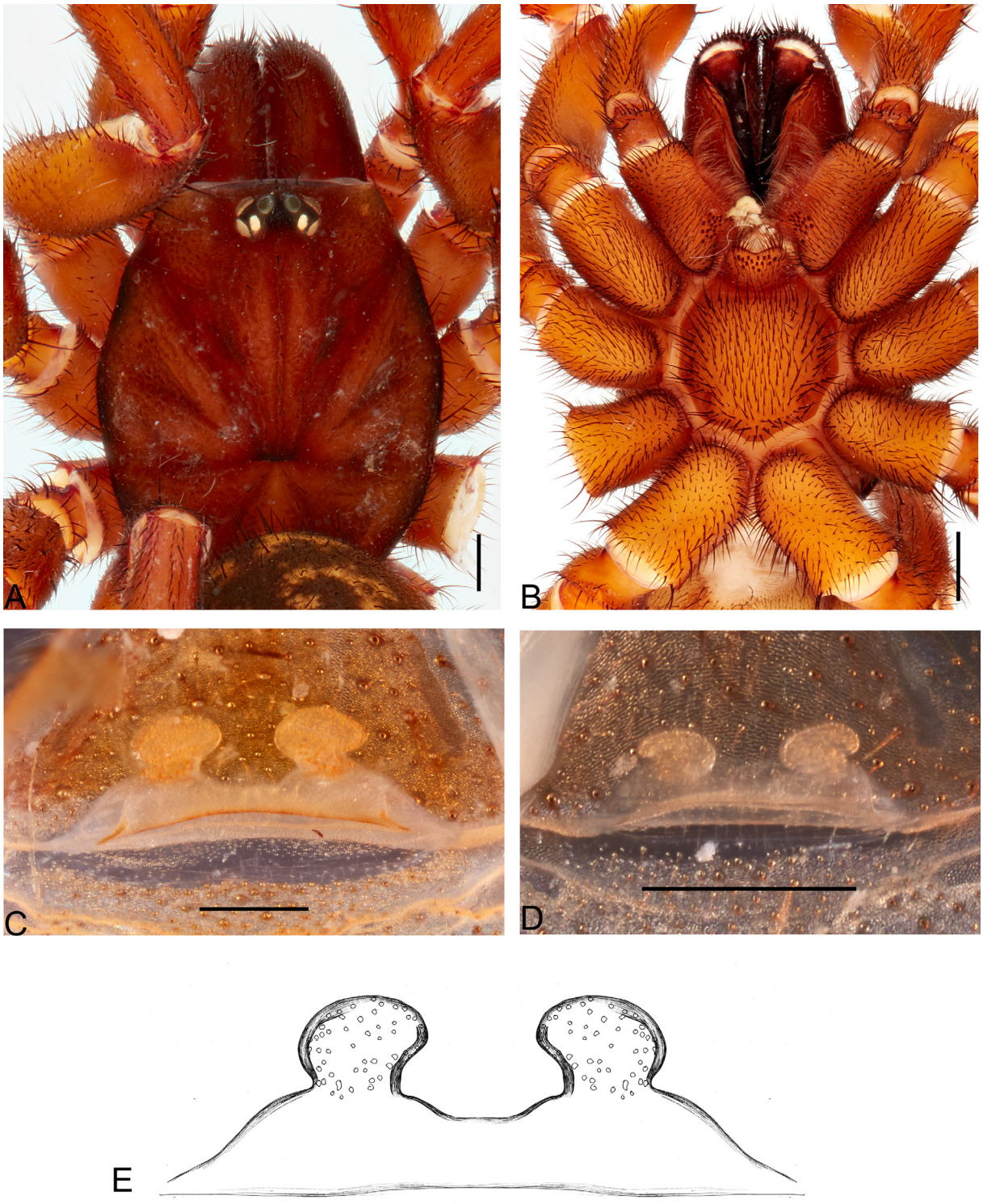

Fig. 14. *Pastaza aureliae* gen. et sp. nov. **A–C**. ♀, holotype (ECFN 7948; QCAZ). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Internal genitalia, dorsal view. **D**. ♀, paratype (ECFN 7949; DTC), internal genitalia, dorsal view. **E**. ♀, paratype (ECFN 8287; QCAZ), internal genitalia, dorsal view. Scale bars: A–B = 1.0 mm; C = 0.5 mm.

Cephalothorax. Carapace elongated-oval, dark orange-brown slightly darker along radiating lines and margin; pars cephalica slightly arched, pars thoracica sloping; fovea straight (Fig. 14A). Labium dark orange-brown margin V-shaped with 15 cuspules (Fig. 14B). Maxillae orange, anterior lobe small; with 19 cuspules; serrula present (Fig. 14B). Sternum wider than long (2.53 length, 2.46 width); with three marginal, oval sigilla (Fig. 14B). Eight eyes in two rows: AME 0.30, ALE 0.34, PME 0.12, PLE 0.32, PME–PME 0.55; ocular quadrangle rectangular (1.24 anterior, 1.22 posterior, 0.56 high).

Chelicerae. Dark reddish-brown; rastellum absent; with 12 promarginal teeth, 22 intermarginal denticles.

Legs. Uniformly dark orange-brown (Fig. 13A); without scopula; filiform trichobothria present on all tarsi (Fig. 29B); tarsi with STC with teeth 5–8 per row, ITC present on all legs; tarsal organ highly elevated, smooth (Fig. 29C–D). Leg measurements: I 16.26 (4.72/2.69/3.94/2.85/2.06); II 15.11 (4.41/1.92/3.47/3.26/2.05); III 13.21 (3.19/1.65/3.01/3.42/1.94); IV 20.60 (5.32/2.26/4.82/5.85/2.36); 4123. Leg spination (spines present on all segments except tarsi): I fe d1-1-1-2-1, pa 0, ti v2-2-3(apical), mt v2-2-2; II fe d1-1-1-2-1, pa 0, ti v2-2-3(apical), mt p1, v2-2-2; III fe d1-1-1-1, pa d1, ti d1-1, r1-1-1, p1-1, v2-2-3(apical), mt d1-1-2-1, p1-1, r 1-1-1, v1-1-3(apical); IV fe d1-1-1-1, pa d1, r1, ti d1-1-1, p1-1, r1-1-1, v1-1-3(apical), mt d1-1-2-1, p1-1, r 1-1-1, v1-1-3(apical).

Abdomen. Oval, dark grayish-brown with yellowish markings, with thick setae anteriorly on sclerotized socket (Fig. 13A–B); spinnerets short (PMS 0.62\PLS 0.88).

Genitalia. Spermathecal bases wide; with large, oval spermathecal heads, on short stalks separated by their diameter (Fig. 14C–E).

Male

Unknown.

Natural history

Females were collected inside a cave in a burrow with lid at the base of a rocky wall. Specimens were collected in a karstic cave at 642 m a.s.l., situated in an evergreen foothill forest of the Eastern Cordillera (BsPn03) (Guevara *et al.* 2013a).

Distribution

Known only from the type locality in Pastaza Province.

Pastaza roberti gen. et sp. nov.
urn:lsid:zoobank.org:act:444A732F-F01C-4A79-B893-5F34B3B82FBF
Figs 15–20, 29E, 30

Diagnosis

Males most resemble those of *P. vegai* sp. nov. but are distinguished by their palpal bulb with two large keels (Fig. 17D), one keel in the latter (Fig. 23D). Females most resemble those of *P. aureliae* sp. nov. but are distinguished by the internal genitalia with spermathecae separated by 2 × their diameter, and on elongated stalks (Fig. 20C–E) whereas in the latter, spermathecae are closer together, separated by their diameter and on short stalks (Fig. 14C–E).

Etymology

The specific epithet is a patronym in honor of Robert Raven, for his contribution to the study of mygalomorph spiders and his support in the study of the South American fauna.

Type material

Holotype

ECUADOR • ♂; Sucumbíos, Green Paradise Lodge; 0°22′47″ S, 76°09′10″ W; 231 m a.s.l.; 24 –28 July 2023; M. Huben and J. McClarin leg.; trap, yellow pan; ECFN 11674; QCAZ.

Paratypes

ECUADOR • 2 ♀♀; Sucumbíos Province; Limoncocha; 0°23′10″ S, 76°36′41″ W; 264 m a.s.l., 21 July 2024; E. Tapia, A. Tapia and N. Dupérré leg.; night collecting along trail; ECFN 11664; ZMH-A0030714; ZMH • 1 ♀; Napo Province; Parroqui Ahuano, Ahuano, Via Misahualli-Ahuano, sector Jatun Sacha, poblado Ñucanchi Causai; 1°03′52″ S, 77°36′42″ W; 387 m a.s.l.; 27 Dec. 2022; E. Tapia and I. Tapia

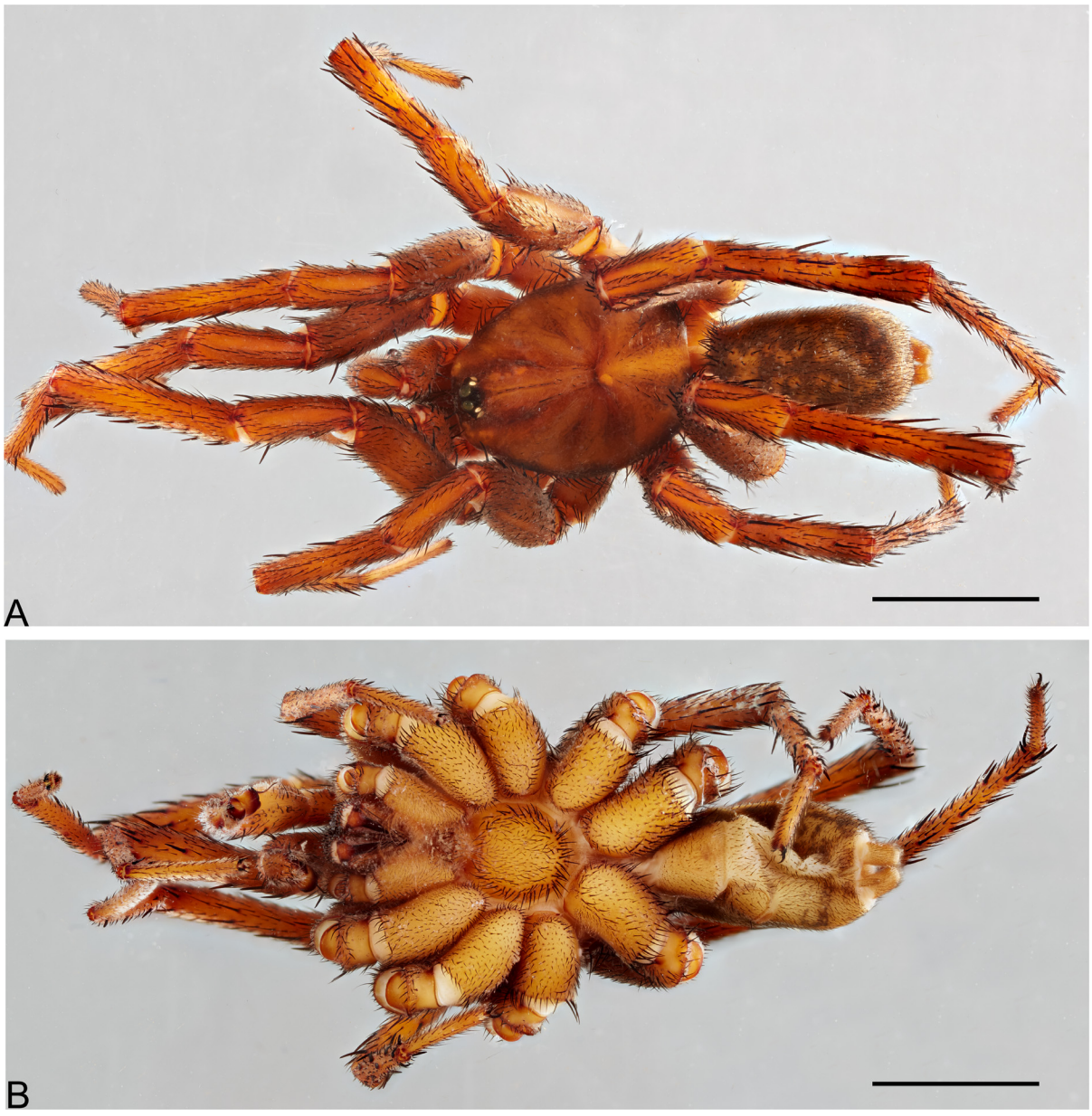

Fig. 15. *Pastaza roberti* gen. et sp. nov., ♂, holotype (ECFN 11674; QCAZ). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. Scale bars: 5.0 mm.

leg.; in burrow at the base of a tree, burrow with lid, at the end of dry season; ECFN 9369; QCAZ • 1 ♀; same data as for preceding; ECFN 9370; DTC.

Description

Male (holotype)

MEASUREMENTS. Total length: 12.01; carapace length: 6.16; carapace width: 4.82; abdomen length: 5.85.

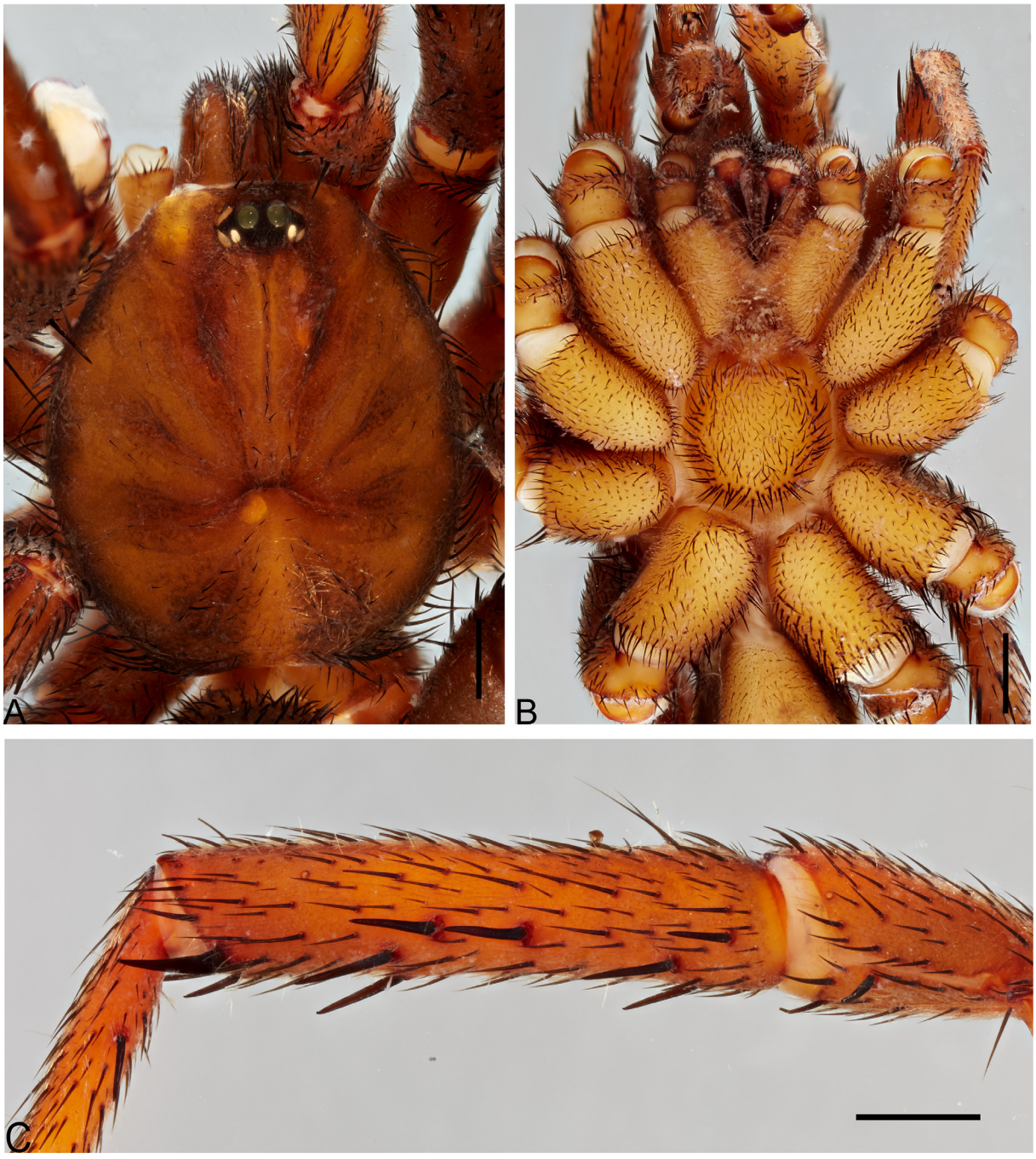

Fig. 16. *Pastaza roberti* gen. et sp. nov., ♂, holotype (ECFN 11674; QCAZ). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Tibia I, retrolateral view. Scale bars: 1.0 mm.

Cephalothorax. Carapace elongated-oval, dark orange-brown slightly darker along radiating lines and margin; pars cephalica flat, pars thoracica sloping; fovea slightly recurved (Fig. 16A).

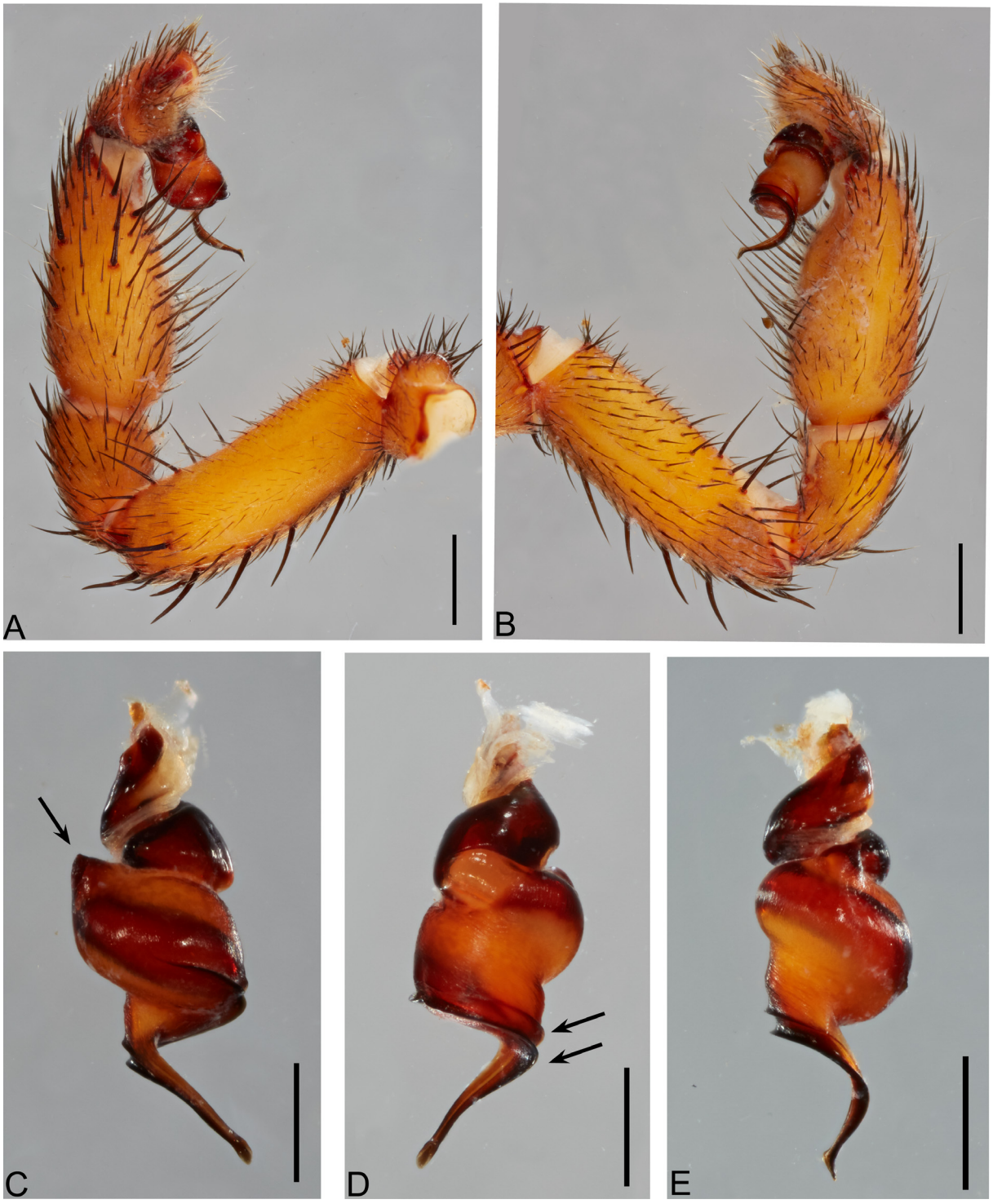

Fig. 17. *Pastaza roberti* gen. et sp. nov., ♂, holotype (ECFN 11674; QCAZ). **A**. Palp, prolateral view. **B**. Palp, retrolateral view. **C**. Bulb, prolateral view (arrow points to tegular heel). **D**. Bulb, ventral view (arrows point to keels). **E**. Bulb, retrolateral view. Scale bars: 0.5 mm.

Chelicerae. Dark reddish-brown, rastellum absent; with 12 promaginal teeth, 15 intermarginal denticles; intercheliceral tumescence inconspicuous. Labium orange margin V-shaped with four cuspules (Fig. 16B). Maxillae orange, anterior lobe small; with 17 cuspules (Fig. 16B); serrula present. Sternum longer than wide (2.21 length, 2.13 width); with three rounded to oval, marginal sigilla (Fig. 16B). Eight eyes in two rows; AME 0.26, ALE 0.30, PME 0.1, PLE 0.19, PME–PME 0.56; ocular quadrangle rectangular (1.03 anterior, 1.01 posterior, 0.51 high).

Legs. Uniformly dark orange-brown (Fig. 15A); scopula on tarsi I–II completely divided, metatarsi I–II 25% apical; tarsi III completely divided, metatarsi III absent, tarsi IV absent (just a few setae), metatarsi IV absent; tibia I with clasping spur (Fig. 16C); filiform trichobothria on all tarsi; tarsi with STC with 5–8 teeth, ITC present on all legs; tarsal organ highly elevated (observed under light microscope). Leg measurements: I 20.18 (5.39/2.88/5.07/3.72/3.12); II 18.28 (4.68/1.90/4.48/4.47/2.75); III 17.20 (4.49/2.14/3.56/4.50/2.51); IV 24.96 (6.22/2.36/5.89/7.50/2.99); leg formula 4123. Leg spination (spines on all segments except tarsi): I fe d1-2-1-1-2, pa p1, v2(apical), ti p1-1, r1-1-1, v2-2-2(apical + 1 clasping spur), mt v1-1-2(apical), p1; II fe d1-2-1-1-2, pa p2, v2(apical), ti r1-1, p1-1, v2-2-3, mt p1-1, v2-2-2(apical); III fe d2-3-2, pa p1, r1-1, v1, ti d2-1-1, p1-1, r1-1, v2-2-3(apical); IV fe d1-1-2-3, pa p1, r1, v1, ti d1-1-1, r1-1-1, p1-1, v2-2-3(apical), mt d1-1-1, p1-1, r1-1, v2-1-2-3(apical).

Abdomen. Oval, dorsally dark grayish-brown with yellowish markings, with thick setae anteriorly on sclerotized socket (Fig. 15A); ventrally light yellow with dark gray meshy pattern basally; spinnerets short (PMS 0.48\PLS 1.05).

Genitalia. Palpal tibia (2.57 length, 1.13 width); cymbium without spines (Fig. 17A–B); bulb with acutely pointed tegular heel (Fig. 17C), strongly constricted; base of embolus with two major keels, embolus twisted with wide tip (Fig. 17C–E).

Female (paratype ECFN 9369)

Measurements. Total length: 13.31; carapace length: 6.58; carapace width: 5.65; abdomen length: 6.73.
Live coloration. Carapace dark blackish-brown with reddish-brown marks on pars thoracica, chelicerae black, abdomen dark brown-orange covered with black setae; leg blackish-brown, tarsi dark brown-orange (Fig. 18A).

Cephalothorax. Carapace as in male, except fovea straight (Fig. 20A). Labium dark orange-brown, margin V-shaped; with seven cuspules (Fig. 20B). Maxillae orange, with small anterior lobe; with 18 cuspules (Fig. 20B); serrula present. Sternum wider than long (2.68 length, 3.02 width); with three marginal, oval sigilla (Fig. 20B). Eight eyes in two rows: AME 0.22, ALE 0.35, PME 0.12, PLE 0.35, PME–PME 0.66; ocular quadrangle rectangular (1.25 anterior, 1.25 posterior, 0.66 high).

Chelicerae. As in male; rastellum absent; with 12 promarginal teeth and 20 intermarginal denticles.

Legs. Uniformly dark orange-brown; scopula absent; filiform trichobothria on all tarsi; tarsi with STC with 3–5 teeth per row, ITC on all legs; tarsal organ highly elevated (Fig. 29E). Leg measurements: I 16.02 (4.47/2.66/3.89/3.22/1.78); II 15.84 (4.39/2.64/3.72/3.30/1.79); III 15.21 (3.88/2.26/3.08/3.83/2.16); IV 21.84 (5.39/2.39/5.33/5.87/2.86); 4123. Leg spination (spines on all segments except tarsi): I fe d1-1-1, pa 0, tib v2-2-3(apical), mt v2-2-2(apical); II fe d1-1-1, pa 0, tib v2-2-3(apical), mt v2-2-2(apical), p1; III fe d1-1, pa p1-1, ti d1-1, p1-1, r1-1, v2-2-3(apical); IV fe d1-1-1, pa r1, ti p1-1, r1-1, v2-2-3(apical), mt d1-1-1, p1-1-1-1, r1-1-1, v2-1-2-3(apical).

Abdomen. Oval, dark grayish-brown with yellowish markings, with thick setae on sclerotized sockets anteriorly (Fig. 19A); spinnerets short (PMS 0.67\ PLS 1.29).

Fig. 18. *Pastaza roberti* gen. et sp. nov., ♀, paratype (ECFN 9369; QCAZ). **A**. Habitus live, dorsal view. **B**. ♀, in burrow.

GENITALIA. Internal genitalia, spermathecal bases wide, with large mushroom-shaped spermathecal heads on long stalks, separated by 2 × their diameter (Fig. 20C–E).

Natural history

The male was collected in a pitfall trap, while females were hand collected in their burrow with lid (Fig. 18B). The species was found between 231–387 m a.s.l. in the lowland evergreen forest of the Amazonian region (BsTa02) (Guevara *et al.* 2013b).

Fig. 19. *Pastaza roberti* gen. et sp. nov., ♀, paratype (ECFN 9369; QCAZ). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. Scale bars: 5.0 mm.

Distribution

Sucumbíos and Napo provinces.

Remarks

Male and females were not collected together, the match is made on habitat compatibility and morphological similarity.

Fig. 20. *Pastaza roberti* gen. et sp. nov. **A–C**. ♀, paratype (ECFN 9369; QCAZ). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Internal genitalia, dorsal view. **D–E**. ♀, paratype (ECFN 11664; QCAZ), internal genitalia, dorsal view. Scale bars: A–B = 1.0 mm; C–D = 0.5 mm.

Pastaza vegai gen. et sp. nov.
urn:lsid:zoobank.org:act:7E691C69-DB19-4578-BD13-8FA500918863
Figs 21–23, 29F, 30

Diagnosis

Males most resemble those of *P. roberti* gen. et sp. nov. but are distinguished by their palpal bulb with one keel, and slightly widened embolus tip (Fig. 23D) whereas in the latter, the palpal bulb has two keels and the embolus tip is strongly widened (Fig. 17D).

Etymology

The specific epithet is a patronym in honor of Mauricio Vega, one of the collectors of the type specimen.

Type material

Holotype
ECUADOR • ♂; Tungurahua Province, Puntzán near Baños; 1°25′28″ S, 78°24′25″ W; 2042 m a.s.l.; 21 Mar. 2011; A. Chagas, A. Giupponi, A. Kury and M. Vega leg.; ECFN 11675; QCAZ.

Description

Male (holotype)
Measurements. Total length: 7.78; carapace length: 3.50; carapace width: 2.08; abdomen length: 2.92.

Cephalothorax. Carapace elongated-oval, orange-brown, slightly darker along radiating lines and margin; pars cephalica flat, pars thoracica sloping; fovea straight (Fig. 22A). Labium light orange, margin V-shaped; with four cuspules (Fig. 22B). Maxillae light orange, with small anterior lobe; with nine cuspules (Fig. 22B); serrula present. Sternum longer than wide (1.48 length, 1.36 width); with three pairs of oval, marginal sigilla (Fig. 22B). Eight eyes in two rows; AME 0.14, ALE 0.18, PME 0.06, PLE 0.17, PME–PME 0.30; ocular quadrangle rectangular (0.64 anterior, 0.65 posterior, 0.37 high).

Chelicerae. Orange-brown, rastellum absent; 10 promarginal teeth, 9 intermarginal denticles; intercheliceral tumescence inconspicuous.

Legs. Uniformly orange-brown (Fig. 21A); tarsi I–II sparse, completely divided scopula, metatarsi I–II 25% apical; tarsi III sparse 50%, divided, metatarsi III–IV absent, tarsi IV absent; filiform trichobothria on all tarsi; tarsi with STC with 5–6 teeth per row, ITC present on all legs; tarsal organ smooth, highly elevated (Fig. 29F). Leg measurements: I 11.04 (3.06/1.61/2.69/2.02/1.66); II 9.39 (2.75/1.29/2.04/2.20/1.11); III 8.81 (2.55/1.49/1.54/2.17/1.06); IV 13.31 (3.43/1.67/2.79/3.60/1.82); leg formula 4123. Leg spination (spines on all segment except tarsi): I fe d1-1-1-1, p1-1, r1, pat d1, v2(apical), ti p1-1, r1-1 v2-2-2(apical) plus megaspine, mt p1, r1-1, v2-1-2(apical); II fe d1-1-1-1, p1-1, r-1-1, pat d1, v2(apical), ti p1-1, v2-2-3(apical), mt d1, v2-1-2; III fe d1-1-1, p1-1, r1-1-1, pat d1, v1, p1-1, r1, ti d1-1, p1-1, r1-1, v2-2-3(apical), mt d1-1-1, p1-1, r1-1, v2-2-3(apical); IV fe d1-1-1-1, p1-1, r1-1, pat d1, v1, r1, p1, ti d1-1-1, p1-1, r1-1, v2-2-3(apical), mt d1-1-1-2, p1-1, r1-1-1, v1-1-1-1-3(apical).

Abdomen. Oval, dark grayish-brown with yellowish markings, with thick setae anteriorly on sclerotized socket (Fig. 21A); spinnerets short (PMS 0.23\PLS 0.36).

Genitalia. Palpal tibia (1.32 length, 0.07 width); cymbium without spines (Fig. 23A–B); bulb with pointed tegular heel (Fig. 23C), constricted with numerous small striae (Fig. 23E); base with one major keel (Fig. 23D), embolus twisted, tip slightly widened (Fig. 23C–E).

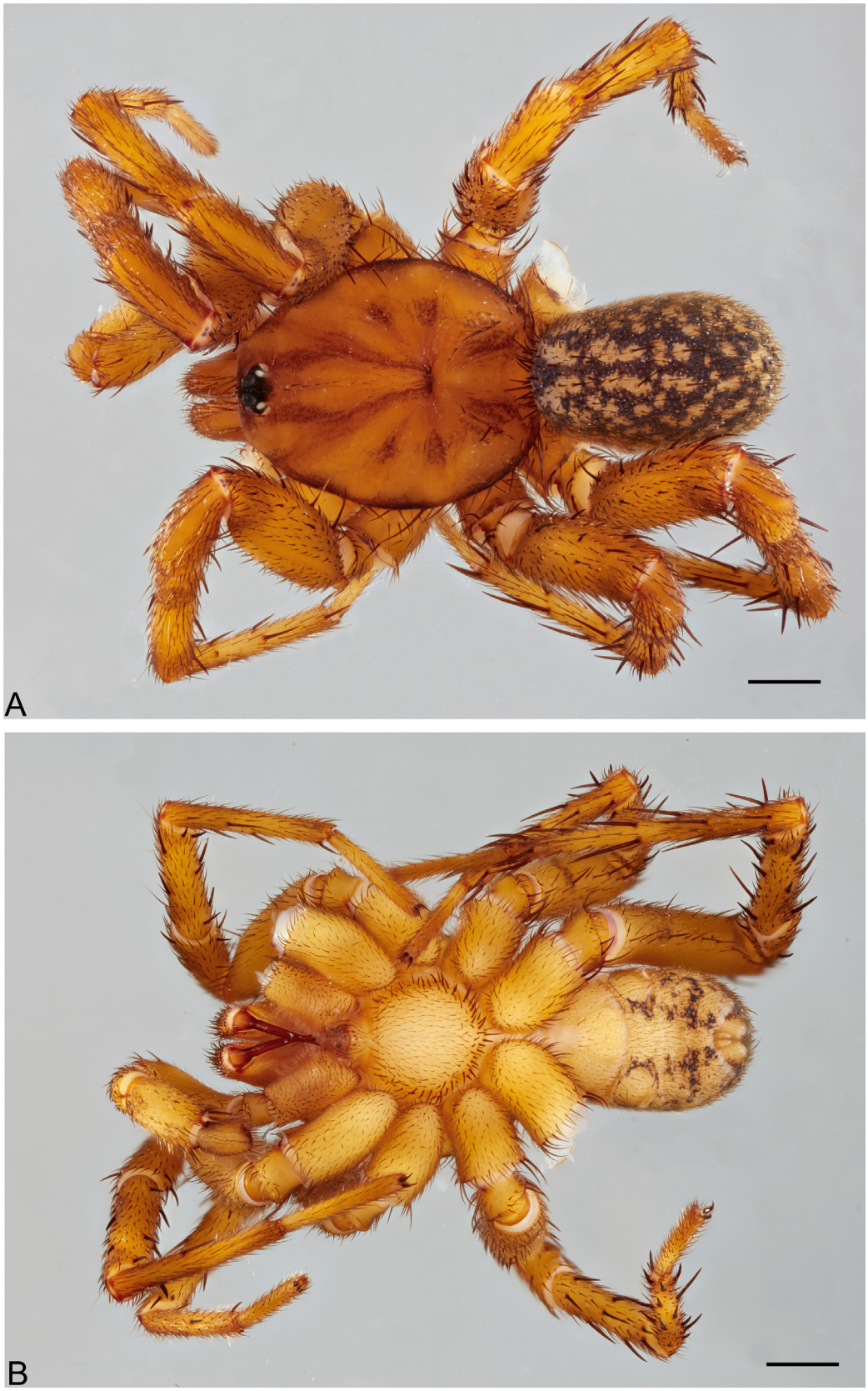

Fig. 21. *Pastaza vegai* gen. et sp. nov., ♂, holotype (ECFN 11675; QCAZ). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. Scale bars: 1.0 mm.

Fig. 22. *Pastaza vegai* gen. et sp. nov., ♂, holotype (ECFN 11675; QCAZ). **A**. Carapace, dorsal view. **B**. Sternum, ventral view. **C**. Tibia I, retrolateral view. Scale bars: 1.0 mm.

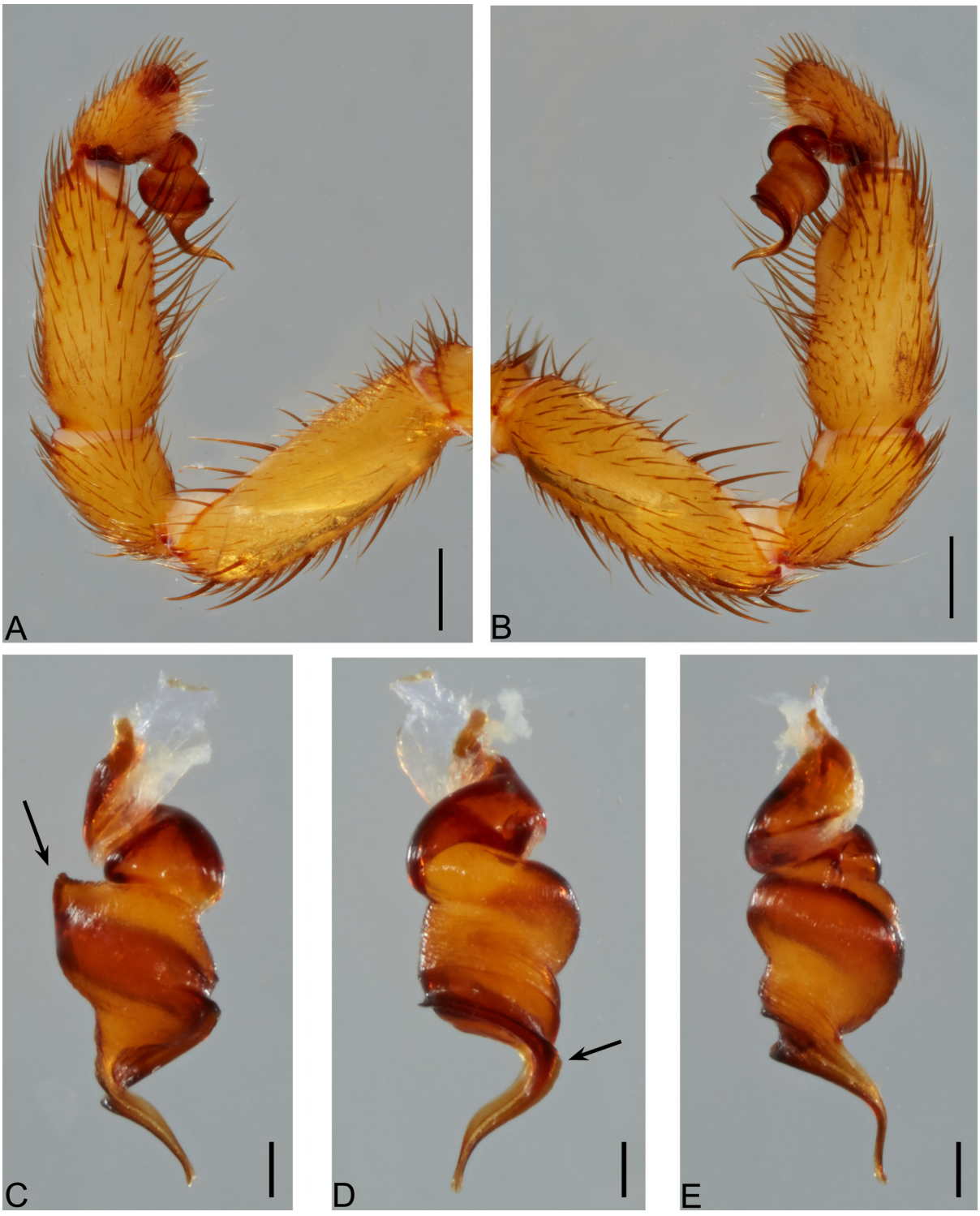

Fig. 23. *Pastaza vegai* gen. et sp. nov., ♂, holotype (ECFN 11675; QCAZ). **A**. Palp, prolateral view. **B**. Palp, retrolateral view. **C**. Bulb, prolateral view (arrow points to tegular heel). **D**. Bulb, ventral view (arrow points to keel). **E**. Bulb, retrolateral view. Scale bars: 0.5 mm.

Female

Unknown.

Natural history

The only male was collected at 2042 m a.s.l. in a montane evergreen forest of the North Eastern Andean range (BsMn01) (Santiana *et al.* 2013a).

Distribution

Known only from Tungurahua Province.

Discussion

Microstigmatidae is considered part of Nemesioidina, a group that comprises the family Nemesiidae as sister-group to a clade including Pycnothelidae, Microstigmatidae, Entypesidae Bond, Opatova & Hedin, 2020, Anamidae Simon, 1889 and Cyrtaucheniidae, Dipluridae Simon, 1889 plus Rhytidicolidae Simon, 1903 (Montes de Oca *et al.* 2022). According to the newly proposed classification by Montes de Oca *et al.* (2022), this family comprises eleven genera. However, the authors note that the family is still considered non-monophyletic, particularly concerning the Neotropical genera.

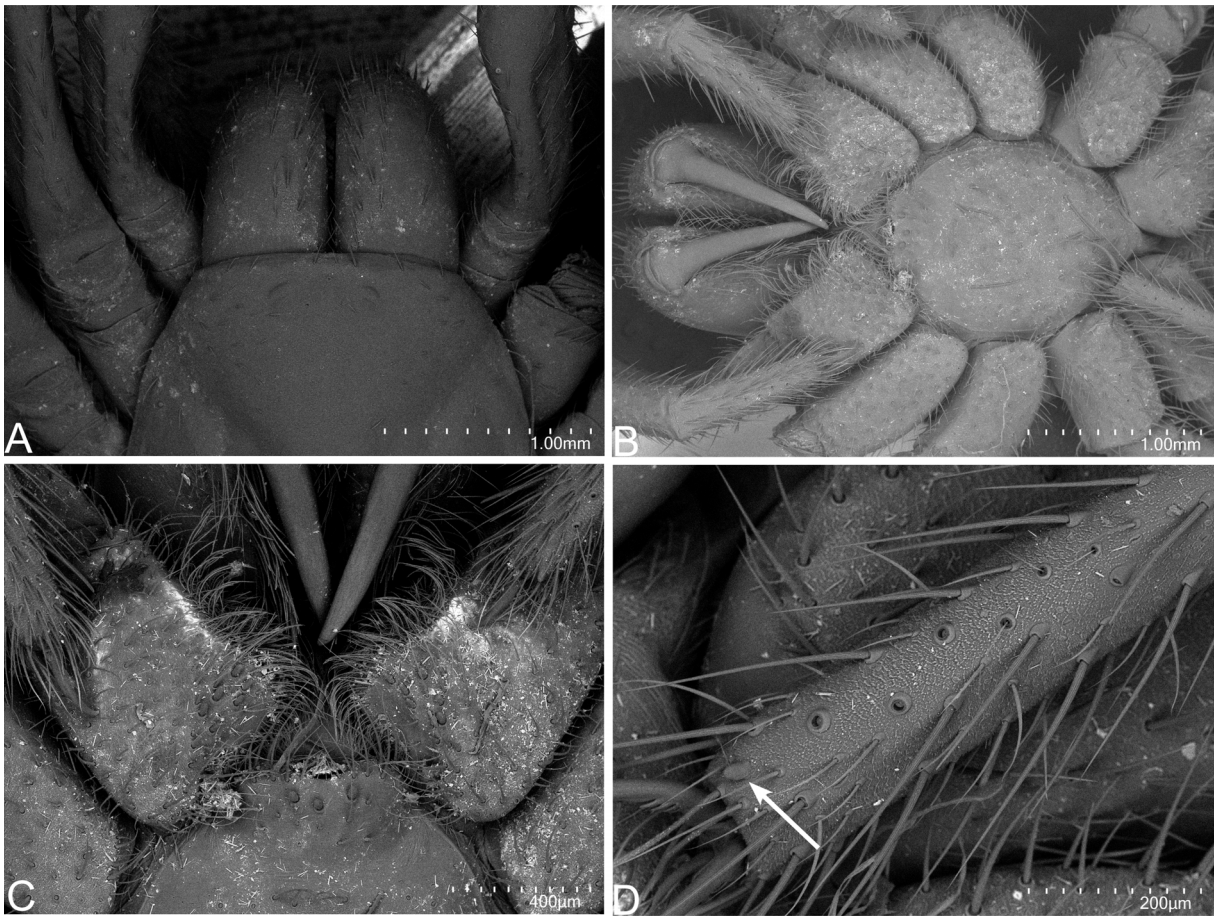

Fig. 24. *Spelocteniza ashmolei* Gertsch, 1982, ♀, holotype (AMNH_IZC 00357161; AMNH), SEM. **A**. Carapace eye region, dorsal view. **B**. Sternum, ventral view. **C**. Labium and maxillae, ventral view. **D**. Tarsus IV, dorsal view (arrow points to tarsal organ).

Establishing diagnostic characters to unite this family is challenging, as most previously identified traits do not apply to all family members. Montes de Oca *et al.* (2022) highlighted that the characters proposed to differentiate *Xenonemesia* from the Microstigmatidae genera mostly only apply to part of the family. For instance, character (3) only thin setae on cymbium (lacking spines), except for *Pseudonemesia,* all other genera lack spines, or character (6) wide and flattened book lungs openings, intermediate width in *Microstigmata*, *Ixamatus*, *Xamiatus* and *Kiama*. The initially recognized diagnostic character, the small, oval book-lung apertures, is highly variable and may be related to size; for instance, the length of the spiracles has been shown to be linearly related to the body weight of "*Eurypelma californicum*" (Reisinger *et al.* 1990). Consequently, diagnosing the family poses significant difficulties, with the only consistent characteristic being the presence of a pustulose or scaly cuticle on the legs.

This morphological study of *Speloctenizа* and the newly described genus *Pastaza* indicates that the combination of cuticle texture – specifically pustulose and scaly – with the morphology and placement of the tarsal organ, may provide promising synapomorphies for the family. All genera with scaly cuticule (see Raven & Platnick 1981: fig. 5) (tribe Pseudonemesiini and subfamily Micromygalinae), such as *Pseudonemesia*, posses a semi-flat tarsal organ, with concentric ridges, situated about two-fifths away from the apex (see Raven & Platnick 1981: fig. 31–32; Indicatti & Villarreal 2016: fig. 5a, d); unfortunately, the tarsal organ placement and type cannot be confirmed for *Envia*. Likewise, in the

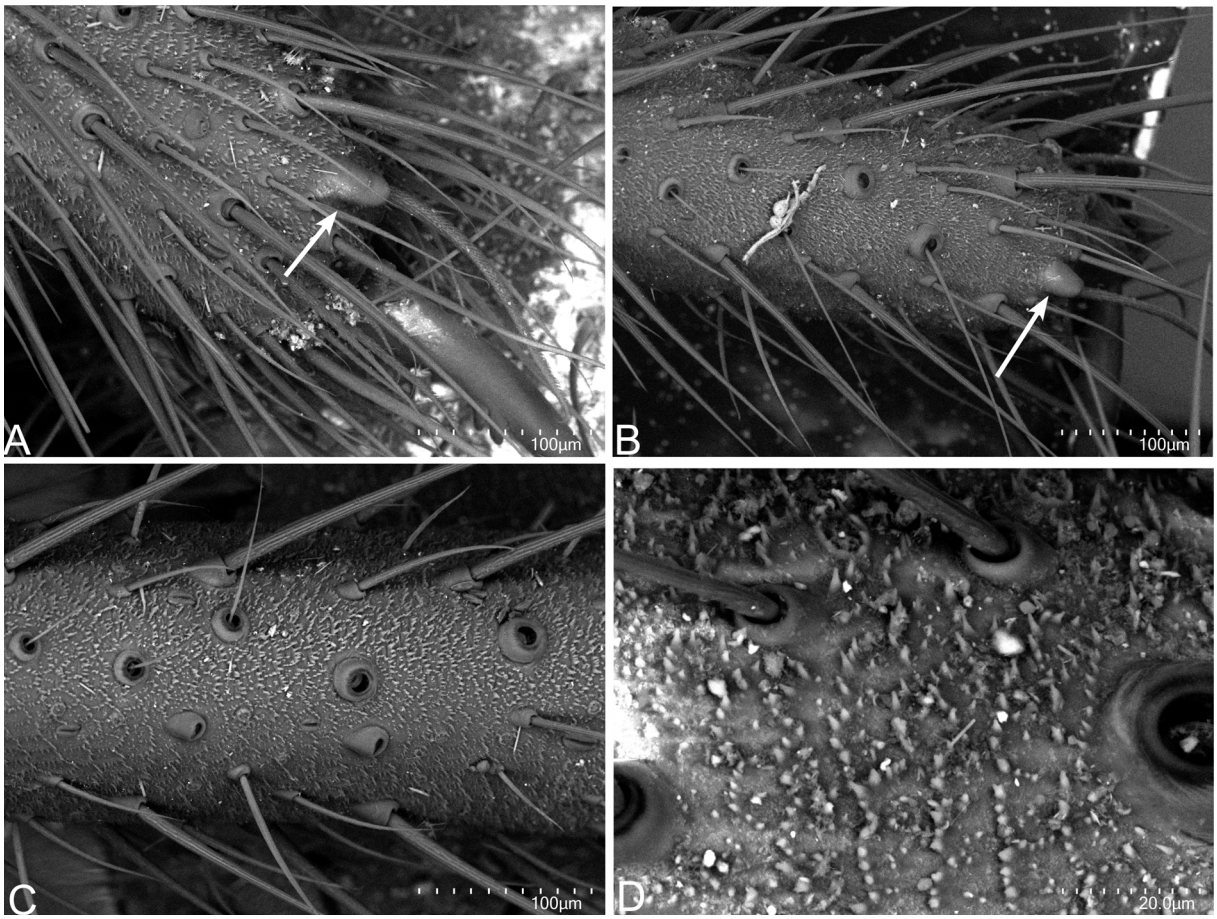

Fig. 25. *Speloctenizа ashmolei* Gertsch, 1982, ♀, holotype (AMNH_IZC 00357161), SEM. **A**. Palp tarsus, dorsal view (arrow points to tarsal organ). **B**. Tarsus III, dorsal view (arrow points to tarsal organ). **C**. Tarsus IV trichobothria, dorsal view. **D**. Tarsus II cuticle, dorsal view.

subfamily Micromygalinae, both *Micromygale* and *Tonton* present a scaly cuticle and a low tarsal organ with concentric ridges (Platnick & Forster 1982: figs 7–8; Passanha *et al.* 2019: figs 1e, 2f).

In contrast, all genera with a pustulose integument have an elevated tarsal organ (highly to intermediate), smooth, situated at the apex of the tarsus: *Specloctenizа* (Fig. 25A–B), *Pastaza* gen. nov. (Fig. 29D),

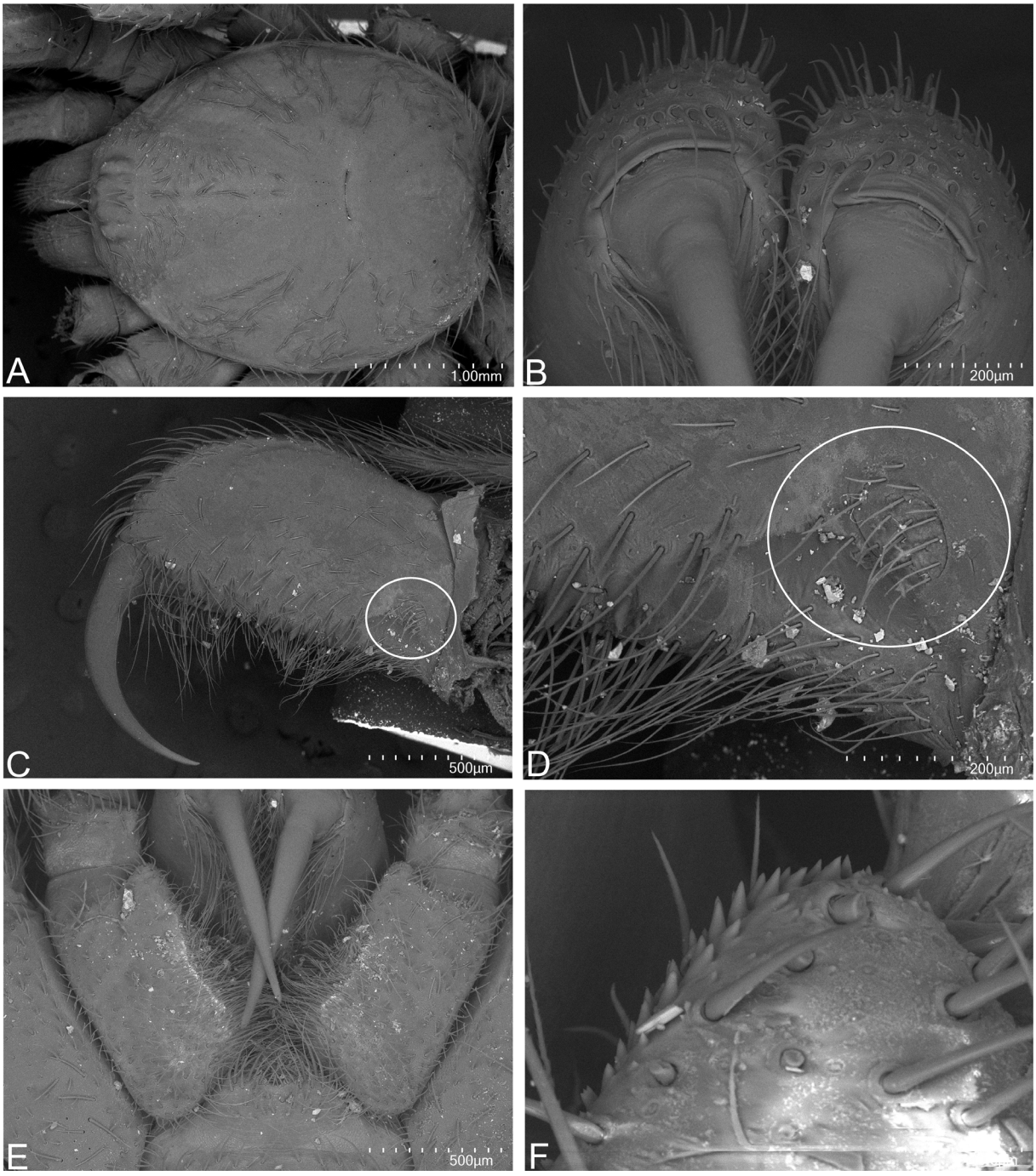

Fig. 26. *Specloctenizа pampenita* sp. nov., ♂, paratype (ZMH-A0030710; ZMH), SEM. **A**. Carapace, dorsal view. **B**. Chelicerae, frontal view. **C**. Chelicerae, lateral view (circle shows intercheliceral tumescence). **D**. Intercheliceral tumescence (enlarged from C). **E**. Maxillae and labium, ventral view. **F**. Serrula, ventral view.

Microstigmata and *Ministigmata* (see Raven & Platnick 1981: figs 7–8, 29–30, 33), *Ixamatus* (see Raven 1982: figs 9–10) and *Xiamatus* (see Raven 1981: fig. 62). The genus *Kiama* was considered to have a pustulose cuticle, an intermediate elevated tarsal organ (see Raven 1981: fig. 61) and was described as having a broader and lower tarsal organ with concentric ridges but no pit and similar to *Angka* (Raven & Schwendinger 1995: fig. 5c). We cannot see the tarsal organ concentric ridges in the SEMs of Raven (1981: fig. 61), the presence of concentric ridges needs to be reconfirmed. Finally, the genus

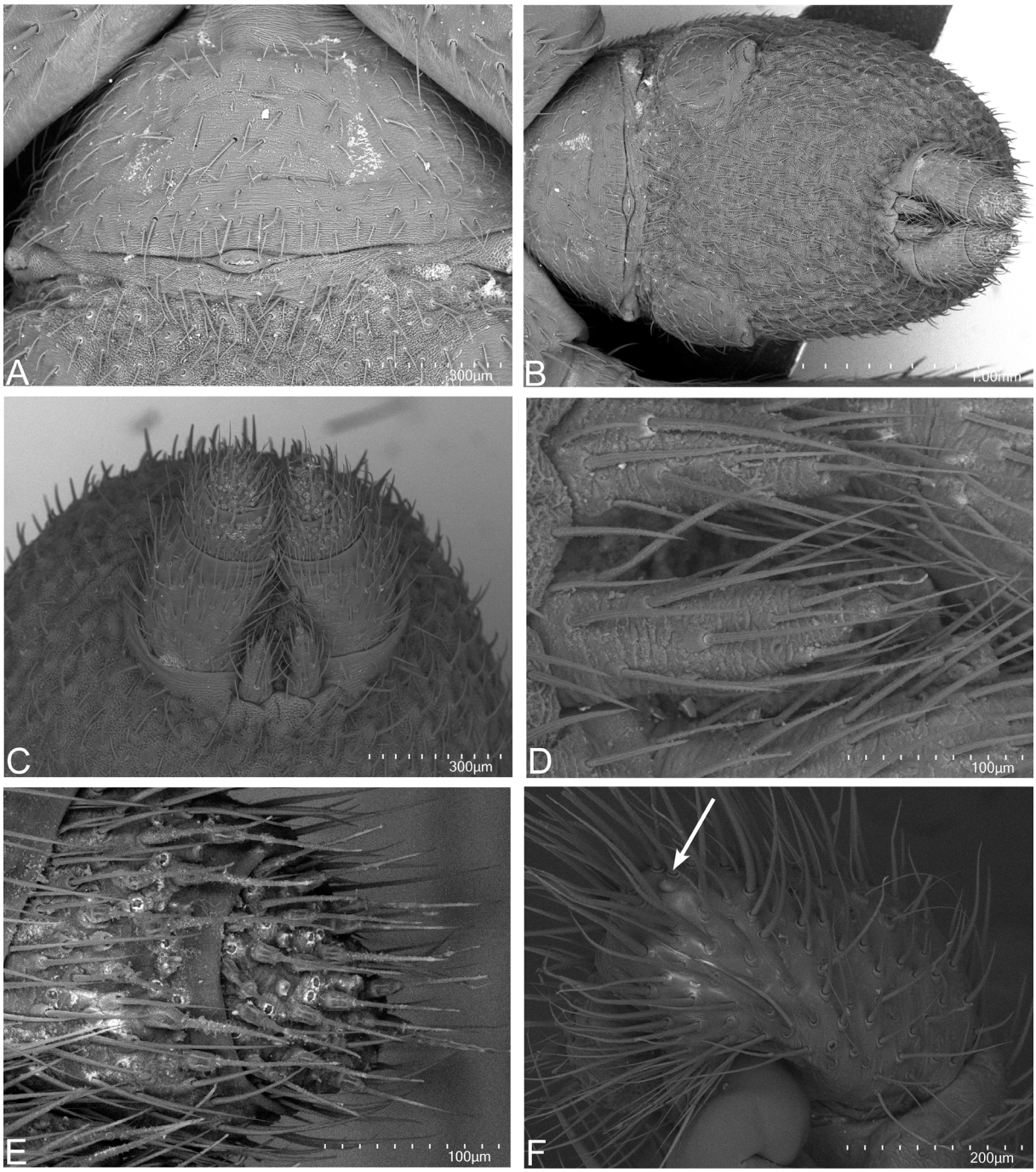

Fig. 27. *Spelocteniza pampenita* sp. nov., ♂, paratype (ZMH-A0030710; ZMH), SEM. **A**. Epigastric region, ventral view. **B**. Abdomen, ventral view. **C**. Spinnerets, posterior view. **D**. PMS, Ventral view. **E**. PLS, ventral view. **F**. Palpal cymbium, retrodorsal view (arrow points to the tarsal organ).

Angka is the only Asian member of the family; the genus was transferred from the Cyrtaucheniidae to the Microstigmatidae by Opatova *et al.* (2020) based on its similarity as stated by Raven (1995). When looking carefully at the images of Raven & Schwendinger (1995: figs 4a, 5a–b), we observe, as stated by the authors, that the distal segment of the leg is finely reticulate and not pustulose or with a scaly cuticle; also, *Angka* has a low tarsal organ with concentric ridges **(**Raven & Schwendinger 1995: fig. 4a). Based on this observation, there is a possibility that *Angka* does not belong in Microstigmatidae.

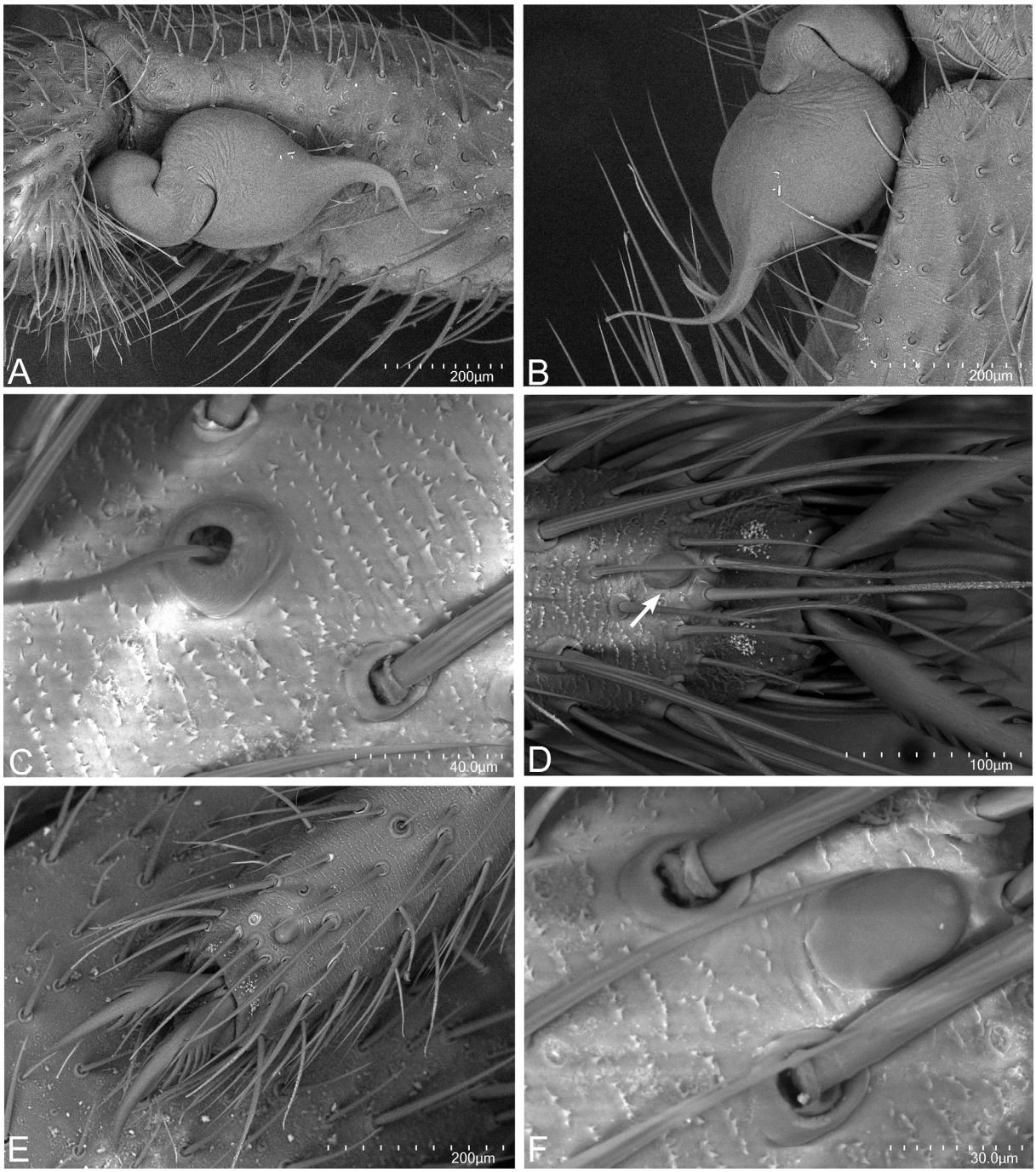

Fig. 28. *Spelocteniza pampenita* sp. nov., ♂, paratype (ZMH-A0030710; ZMH). SEM. **A**. Palpal bulb, ventral view. **B**. Palp, retrolateral view. **C**. Trichobothria, tarsus I. **D**. Tarsus III, dorsal view (arrow points to tarsal organ). **E**. Tarsus I, dorsal view. **F**. Tarsus I, tarsal organ.

As further molecular and morphological analyses are being conducted on this group, it is hypothesised that the family Microstigmatidae will be limited to the genera that exhibit a pustulose cuticle with a high, smooth tarsal organ situated at the apex of the tarsus such as: *Spelocteniza*, *Pastaza* gen. nov., *Microstigmata***,** *Ministigmata*, *Ixamatus* and *Xiamatus*. Whereas the other group with the tarsal organ

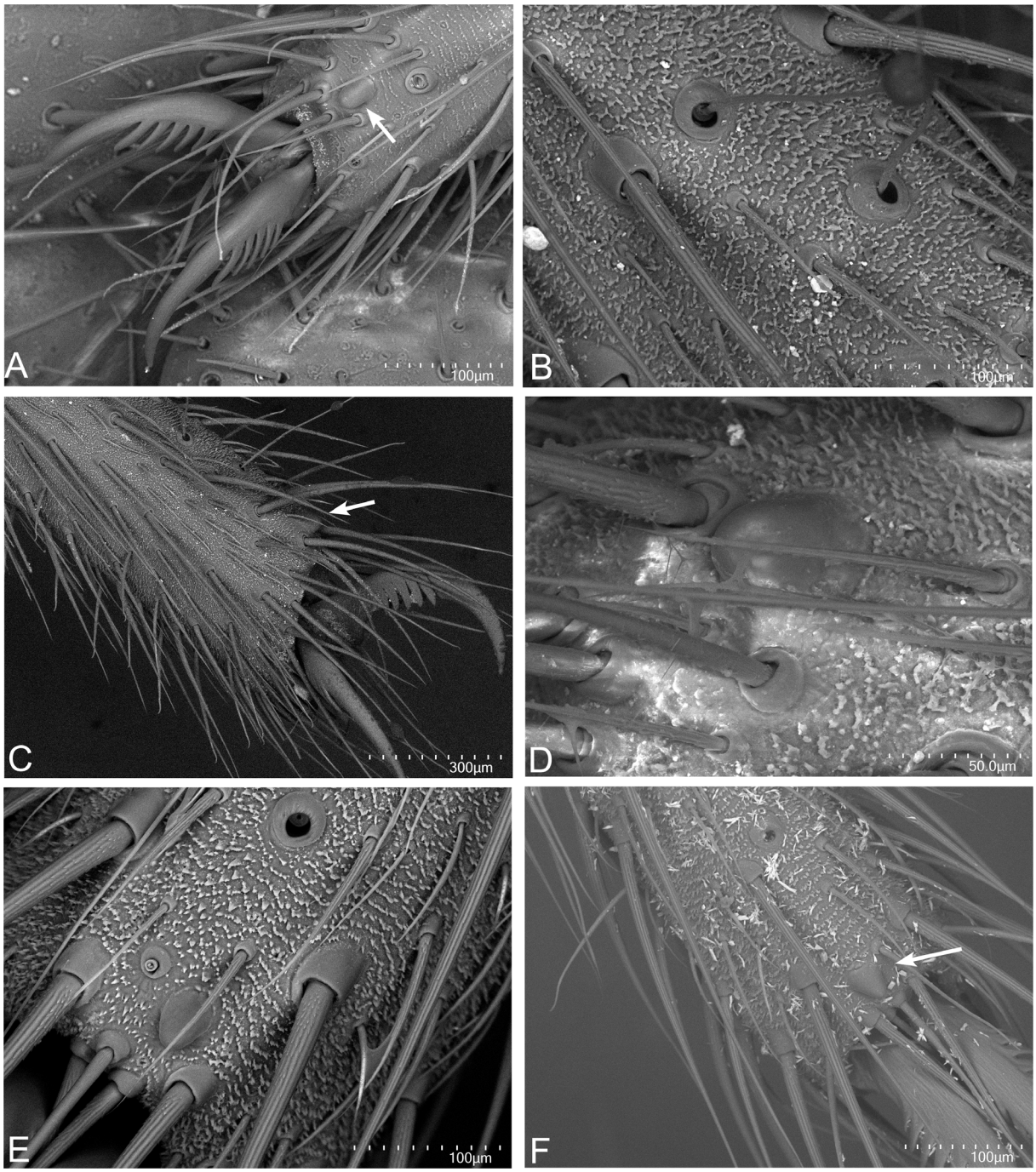

Fig. 29. SEM. **A**. *Spelocteniza pampenita* sp. nov., ♂, paratype (ZMH-A0030710; ZMH), tarsus II, dorsal view (arrow points to tarsal organ). **B–D**. *Pastaza aureliae* gen. et sp. nov., ECFN 7948 (QCAZ) **B**. Tarsus III, dorsal view. **C**. Tarsus III, dorsal view (arrow points to tarsal organ). **D**. Tarsal organ II, dorsal view. **E**. *Pastaza roberti* gen. et sp. nov. (ZMH-A0030714), tarsus I, dorsal view. **F**. *Pastaza vegai* gen. et sp. nov., (QCAZ), tarsus I, dorsal view (arrow points to tarsal organ).

semi-flat, about two-fifths away from the apex with concentric ridges and a scaly cuticle, such as *Pseudonemesia*, *Envia*, *Micromygale* and *Tonton* will likely be placed in a different family.

New taxonomic discoveries and descriptions of previously unknown biodiversity are continually emerging, and the growing number of morphological and molecular studies on this group will decisively clarify its paraphyletic status. These developments underscore the critical importance of taxonomical, morphological, and molecular investigations.

Interestingly, we found that females of *Specloctenizа* and *Pastaza* gen. nov. construct burrows with covers. This behavior contrasts with that of their African relatives but is similar to that of one of their Australian counterparts, *Kiama*. So far, no South American species have been observed using debris, soil or sand to cover their cuticle as reported in Africa members of the family or as in the family Paratropididae Simon, 1889. In Ecuador, the Microstigmatidae was found in two of the three main ecoregions, the Andes and the Amazon, but not yet in the Pacific region.

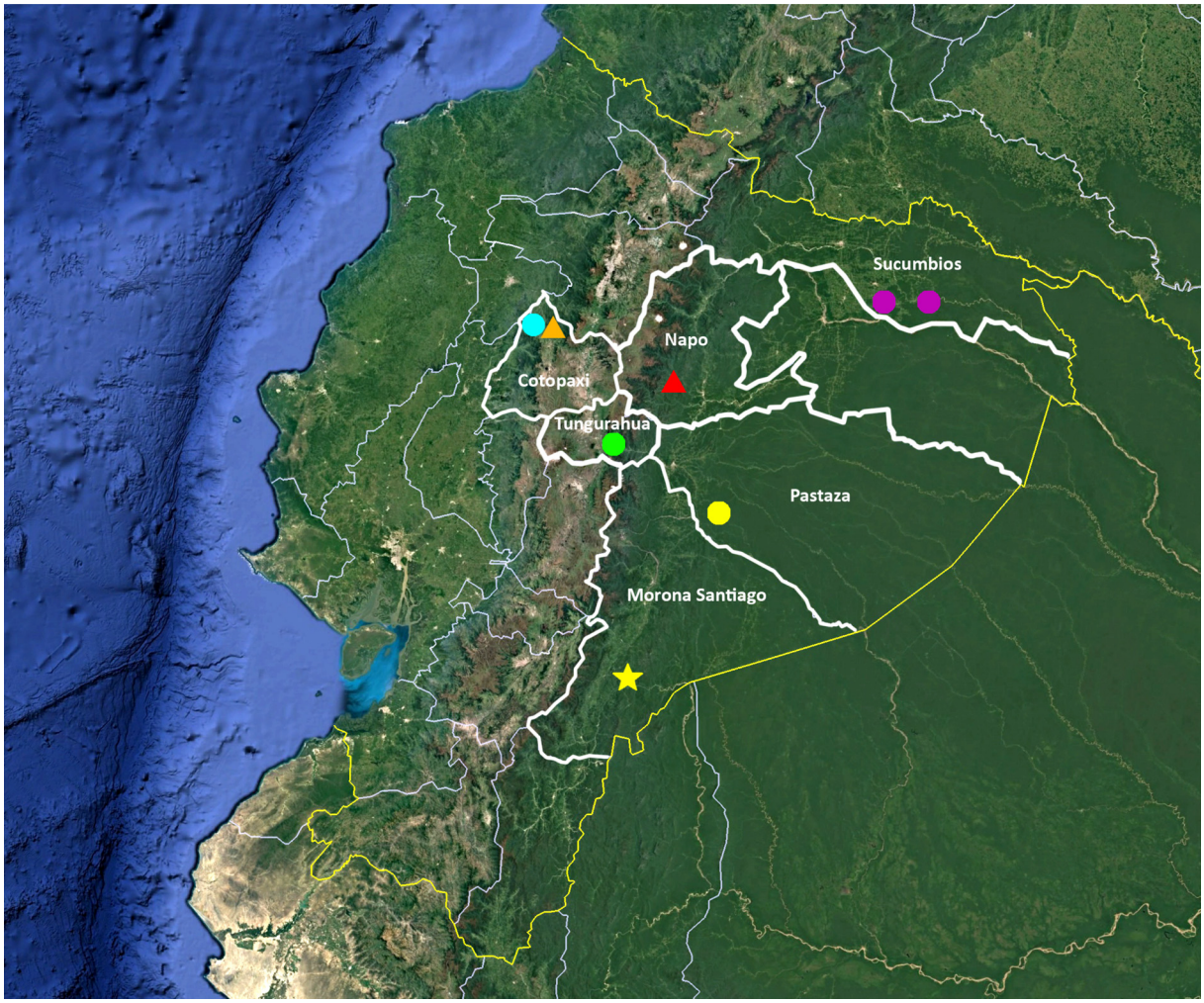

Fig. 30. Distribution map of members of the family Microstigmatidae Roewer, 1942 in Ecuador. *Specloctenizа ashmolei* Gertsch, 1982 (yellow star), *Specloctenizа pampenita* sp. nov. (orange triangle), *Specloctenizа zuninoi* sp. nov. (turquoise circle), *Pseudonemesia scutata* gen. et sp. nov. (red triangle), *Pastaza aureliae* gen. et sp. nov. (yellow circle), *Pastaza roberti* gen. et sp. nov. (pink circles), *Pastaza vegai* gen. et sp. nov. (green circle).

Acknowledgments

The authors are thankful to Rafael Cardenas, Alvaro Barragán, Fernanda María Salazar, Véronica Crespo-Pérez, Diego Guevara, Doris Vela and María Fernanda Checa from the Museum of Invertebrates, Pontificia Universidad Católica del Ecuador, Quito (QCAZ) for their support, access to the collection. Special thanks to Dr Giovanni Onore of the OTONGA Foundation and Dr Luis Coloma of the Jambatu Foundation, Centro de Investigación y Conservación de Anfibios for their friendship and technical support with the photograph system and to Anabelle Tapia, for her help in collecting specimens. Part of the research was funded by the BMBF (Bundesministeriurm für Bildung und Forschung) funding code 01DN25004. The collection of specimens was done under the permits (N° 006-14-IC-FAU-DNB/MA; N° 003-18-IC-FAU-DNB/MA; N° 009-19-IC-FAU-DNB/MA; MAE-DNB-CM-2020-0130, MAATE-ARFSFC-2024-0403), and the exportation of specimens was done under the permits (N° 38-2024-EXP-IC-DBI/MAATE) of the Ministerio de Ambiente, Quito, Ecuador.

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