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REDESCRIPTION OF THE HOLOTYPE FEMALE OF *ANISASPOIDES GIGANTEA* F. O. PICKARD-CAMBRIDGE, 1896 WITH DISCUSSION AND TYPIFICATION OF *ANISASPIS TUBERCULATA* SIMON, 1892 (ARANEAE: PARATROPIDIDAE)

Danniella Sherwood[1]*, Sylvia M. Lucas[2] & Antonio D. Brescovit[2]

[1] Arachnology Research Association, United Kingdom.
[2] Laboratório de Coleções Zoológicas, Instituto Butantan, Av. Vital Brasil, 1500, São Paulo, Brazil
* Corresponding author: danni.sherwood@hotmail.com

Abstract: The Brazilian paratropidid *Anisaspoides gigantea* F. O. Pickard-Cambridge, 1896 is redescribed based on the female holotype, and the Saint Vincentian paratropidid *Anisaspis tuberculata* Simon, 1892 is also illustrated, discussed, and typified based on the immature syntypes. The urgent need for more material of these taxa in order to understand their taxonomic placements is emphasised.
Key words: Araneae, Paratropididae, mud spider, taxonomy, museums, morphology, Brazil, St. Vincent.

Redescripción de *Anisaspoides gigantea* F. O. Pickard-Cambridge, 1896 con discusión y tipificación de *Anisaspis tuberculata* Simon, 1892 (Araneae: Paratropididae)
Resumen: El paratropídido brasileño *Anisaspoides gigantea* F. O. Pickard-Cambridge, 1896 se vuelve a describir a partir del holotipo hembra, y también se ilustra, discute y tipifica el paratropídido de San Vicente *Anisaspis tuberculata* Simon, 1892 a partir de los sintipos juveniles. Se pone de relieve la necesidad urgente de estudiar más material de estos taxones con el fin de entender su posición taxonómica.
Palabras clave: Araneae, Paratropididae, arañas de barros, taxonomía, museos, morfología, Brasil, San Vicente.

Introduction

Simon (1899) proposed Paratropididae Simon, 1889, with the type genus *Paratropis* Simon, 1899 to house the species *Paratropis scruposa* Simon, 1889 based on a single female specimen from Peru. Simon (1892b) proposed the new genus *Anisaspis* Simon, 1892 from Saint Vincent Island based on a single supposed female: *Anisaspis tuberculata* Simon, 1892. Simon had previously referred to this species as "*Anisaspis bacillifera*" (see Simon, 1892a) but this is a *lapsus* and a *nomen nudum*, Simon had clearly expected his other work to appear first, as it (Simon, 1892b) is referenced with the date 1891 in Simon (1892a).

F. O. Pickard-Cambridge (1896) described a new species from Brazil, *Paratropis papilligera* F. O. Pickard-Cambridge, 1896 based on both sexes. In the same work, he proposed the genus *Anisaspoides* F. O. Pickard-Cambridge, 1896 to house the species *Anisaspoides gigantea* F. O. Pickard-Cambridge, 1896 also from Brazil, based only on the female, and which was differentiated from *Paratropis* by presence of two spinnerets and a third tarsal claw only on legs I and II (F. O. Pickard-Cambridge 1896; Raven 1985; Valdez-Mondragón *et al*. 2014).

Mello-Leitão (1923) described another Brazilian species, *Paratropis sanguinea* Mello-Leitão, 1923 based on a single female specimen. Similarly, Caporiacco (1955) described another species based on a single female, this time from Venezuela, *Paratropis seminermis* Caporiacco, 1955. The genus *Paratropis* remained unchanged in species composition until Valdez-Mondragón, Mendoza & Francke (2014) reported specimens from Southern Mexico for the first time, describing this material as *Paratropis tuxtlensis* Valdez-Mondragón, Mendoza & Francke, 2014 based on specimens of both sexes.

Dupérré (2015) described the Ecuadorian species, *Paratropis elicioi* Dupérré, 2015 from both sexes and provided an updated key to genera of the subfamily Paratropidinae Simon, 1889 adapted from Raven (1985). She also commented on some of the morphological features previously used for cladistic definition of these genera and noted that tarsal claw presence/absence was variable and should be reconsidered as a definitive character.

Perafán, Galvis & Pérez-Miles (2019) contributed to the paratropidid taxa from Colombia, describing *Anisaspis camarita* Perafán, Galvis & Pérez-Miles, 2019 and *Paratropis florezi* Perafán, Galvis & Pérez-Miles, 2019. They additionally described the new genus *Stormtropis* Perafán, Galvis & Pérez-Miles, 2019 to house four new species: *Stormtropis colima* Perafán, Galvis & Pérez-Miles, 2019, *S. muisca* Perafán, Galvis & Pérez-Miles, 2019, *S. paisa* Perafán, Galvis & Pérez-Miles, 2019 and *S. parvum* Perafán, Galvis & Pérez-Miles, 2019. They also claimed the description of *P. elicioi* was flawed and 'redescribed' it based on non-type material from Colombia.

Most recently, Dupérré & Tapia (2020) noted that the Colombian material used for the redescription of *P. elicioi* was not conspecific with the type material from Ecuador and that Perafán, Galvis & Pérez-Miles (2019) had not examined the holotype. They also described two new sympatric species, *Paratropis otonga* Dupérré & Tapia, 2020 from the female and *Paratropis pristirana* Dupérré & Tapia, 2020 from both sexes.

Here in this work, the genus *Anisaspoides* is redefined and the type species, *A. gigantea,* redescribed. The immature syntypes of *Anisaspis tuberculata* are illustrated and a lectotype assigned in accordance with the International Code of Zoological Nomenclature (1999). The critical need for the male of *A. gigantea* and the adults of both sexes of *A. tuberculata* to be described is discussed.

Materials and methods

Specimens were examined under a Leica MZ12.5 binocular stereomicroscope, photographs of spermathecae, maxillae and habitus were made using a Canon EOS 6D Mark II attached to a Leica MZ12.5 with images stacked using Helicon Focus software. Abbreviation, Institutions: BMNH = Natural History Museum, London, United Kingdom. Morphology: ALE = anterior lateral eyes; AME = anterior median eyes; d = dorsal; imm. = immature; ITC = inferior tarsal claw; PLE = posterior lateral eyes; PME = posterior median eyes; PMS = posterior median spinnerets; PLS = posterior lateral spinnerets; v = ventral. Spines are considered as emerging from a dark base and are counted regardless of whether their apex is light or dark. Thorn-like setae (*sensu* Perafán, Galvis & Pérez-Miles, 2019) are considered to be all stout setae not emergent from circular bases. Leg formulae starts with the longest leg to the shortest in order of decreasing size, e.g. 4,1,2,3. Authors' emphases in [ ]. All measurements are in mm.

Results

***Anisaspis tuberculata* Simon, 1892**
Anisaspis bacillifera Simon, 1892: 78. (*lapsus*)
Anisaspis tuberculata Simon, 1892: 550.
Anisaspis tuberculata: F. O. Pickard-Cambridge 1896: 728, pl. 44, figs. 3–5.
Anisaspis tuberculata: Raven 1985: 122, figs. 165–170.

TYPE MATERIAL: Lectotype (designated herein) imm. ♀ (BMNH 1894.10.17.1–3), S[ain]t Vincent [Lesser Antilles] examined; paralectotype (designated herein) imm. ♀ (BMNH 1894.10.17.1–3), [same data], examined.

DIAGNOSIS: As the type series is immature, genitalic characters or indeed any confirmed adult characteristics to delineate adult males and females of *Anisaspis tuberculata* against other known paratropidids is not possible. However, the absence of PMS differentiates it from the genera *Paratropis* and *Stormtropis*. *Anisapsis tuberculata* can supposedly be differentiated from *A. camarita* Peráfan, Galvis & Pérez-Miles, 2019 by the presence of a distal tarsal spine, longer PLS with domed [here as cylindrical] apical segment and the presence of a "super-tubercle" underneath the AME (Peráfan, Galvis & Pérez-Miles, 2019). Given the types of *A. tuberculata* are immature it is impossible to know if these differences are merely due to ontogeny and adults must be urgently described. Similarly, the sole current character to split *Anisapsis* from *Anisaspoides* (the total absence of ITC) may be ontogenetic and must be investigated by future workers.

DISTRIBUTION: Saint Vincent Island, Lesser Antilles

REMARKS: Both syntypic specimens of *Anisaspis tuberculata* are immature (Figs. 1–4). The original accession number indicates the sample contained three specimens at the time of accession, meaning the third specimen is lost. Here, the cheliceral teeth arrangements for both specimens are presented (Figs. 5–6). The opisthosomal tubercles are more prominent on the smaller specimen (Fig. 7) although this could be due to ontogeny, a more recent ecdysis or perhaps both. Tarsi I–IV all bear a pair of tarsal claws with each possessing a medial tooth, the palpal tarsi bear a single tarsal claw lacking a medial tooth. As noted by Perafán, Galvis & Pérez-Miles (2019) *A. tuberculata* lacks PMS, possessing only PLS a feature that readily separates *Anisaspis* from *Paratropis* and *Stormtropis*. Simon (1892) had considered the larger specimen to be an adult female and subsequent examination of the epigastric furrow confirms this specimen is likely female but nonetheless, that it is immature. The second, smaller specimen also has an epigastric furrow consistent with that of an immature female. Thus, new material of this species will need to be described in order to fully understand its taxonomic identity and further elucidate its systematic relationships to other paratropidid genera. Curiously, Perafán, Galvis & Pérez-Miles (2019) do not mention the presence of a second specimen in the type series of *A. tuberculata*, only listing the "holotype". In actuality, since there are two specimens present, they are syntypes following the Code (ICZN, 1999). Therefore, the larger specimen is hereby designated as the lectotype, and the smaller specimen is by default the paralectotype. For the taxonomic status of *A. tuberculata* to be comprehensively evaluated it is necessary to describe the topotypic adults of both sexes. Until this is possible, this taxon will remain poorly known.

Perafán, Galvis & Pérez-Miles (2019: 5) state in their diagnosis of the genus "*Anisaspis* differs from other paratropidid genera by the presence of only two spinnerets (PLS) (Figure 1D) …" but this is misleading as *Anisaspoides* also has sole presence of PLS, furthermore their figure 1D is a photograph of part of the carapace, the ocular tubercle, and the chelicerae (Perafán, Galvis & Pérez-Miles, 2019: 6, fig. 1D). It is possible they intended to diagnose *Anisapsis* based on a combination of all the characters they mention but this is not made explicit. One of these other characters, the absence of a tibial apophysis in the male, should be re-examined upon study of much more material, as the presence vs. absence of a tibial apophysis has been found to be intergenerically variable in other mygalomorph genera, especially within Theraphosidae Thorell, 1869 (pers. obs.).

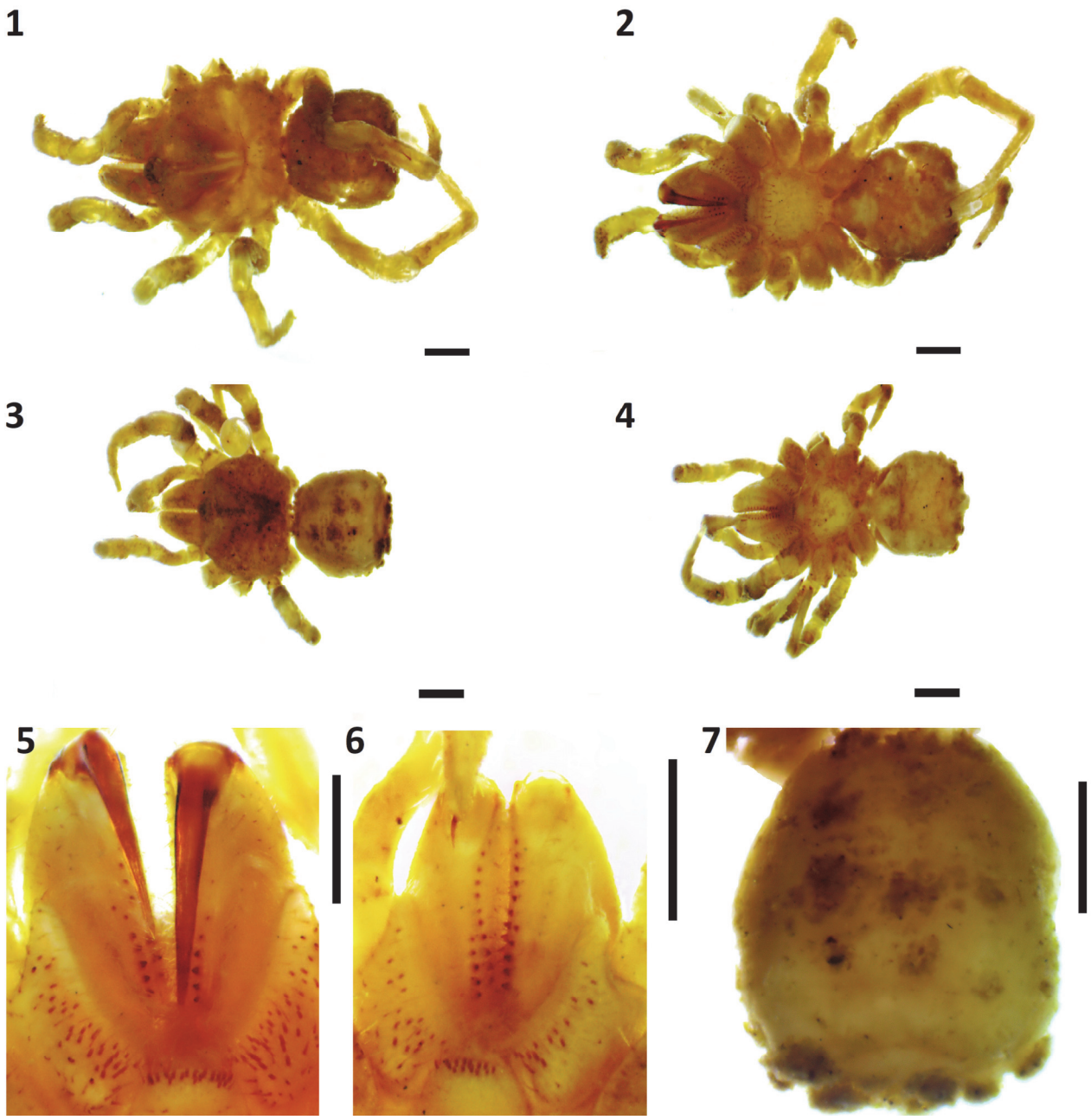
***Anisaspoides* F. O. Pickard-Cambridge, 1896**
Anisaspoides F. O. Pickard-Cambridge, 1896: 726.

TYPE SPECIES: *Anisaspoides gigantea* F. O. Pickard-Cambridge, 1896 by monotypy.

DIAGNOSIS: *Anisaspoides* can be tentatively differentiated from *Anisaspis* spp. by the presence of an ITC on tarsi I–II (ITC totally absent in *Anisaspis*) and from females of *Paratropis* and *Stormtropis* spp. by the morphology of the spermathecae, basally fused with medial separation and circular lobes at the apex of the two respective receptacles (not so in *Paratropis* and *Stormtropis*) and by the absence of PMS (PMS present in *Paratropis* and *Stormtropis*). A stronger diagnosis can be made once the missing male is described, in addition to the adults of both sexes of *Anisaspis tuberculata*, the female of *Anisaspis camarita*, and the respective missing sexes of several *Paratropis* and *Stormtropis* species.

DISTRIBUTION: Brazil

SPECIES INCLUDED: *A. gigantea*



Figs. 1–7: *Anisaspis tuberculata* lectotype and paralectotype immature females (BMNH 1894.10.17.1–3), **1** lectotype dorsal habitus, **2** lectotype ventral habitus, **3** paralectotype dorsal habitus, **4** paralectotype ventral habitus, **5** lectotype chelicerae and labium, ventral view, **6** paralectotype chelicerae and labium, ventral view, **7** paralectotype opisthosoma, dorsal view. Scale bars = 1mm.

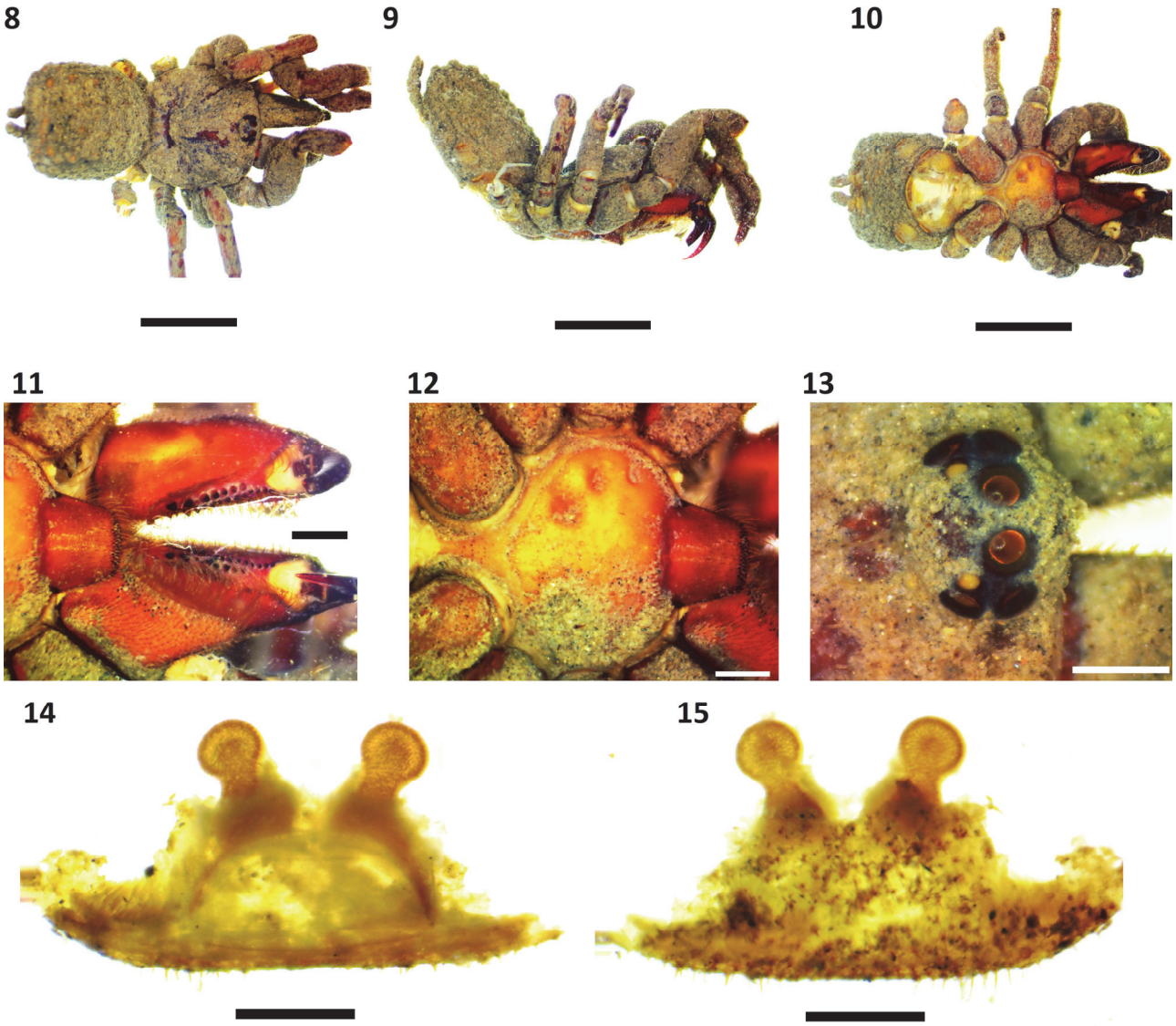
***Anisaspoides gigantea* F. O. Pickard-Cambridge, 1896**

Anisaspoides gigantea F. O. Pickard-Cambridge, 1896: 726, pl. 34, fig. 37.

TYPE MATERIAL: Holotype ♀ (BMNH 1896.12.13.71), Breves, [Pará, Brazil], Feb 1896, Lower Amazonas Expedition coll., examined.

DIAGNOSIS: As per the generic diagnosis *A. gigantea* can be tentatively differentiated from *Anisaspis tuberculata* by presence of an ITC on tarsi I–II and from females of *Paratropis* and *Stormtropis* based on spermathecal morphology. The diagnosis of this species (and indeed of the genus) cannot be fully understood until males are collected and described.

DESCRIPTION: Holotype female (BMNH): Total length including chelicerae: 20.0. Carapace: length 7.7, width 7.6. Caput: raised. Eye tubercle: raised, length 1.1, width 1.6, AME<ALE, ALE>PLE, PLE<PME (Fig. 13). Fovea: shallow, slightly recurved. Abdomen: length 8.4, width 7.3. Chelicera: length 3.9, width 2.5. Cheliceral teeth arranged in two parallel diagonal rows (Fig. 11). Maxilla: with 25–30 cuspules covering approximately 42% of the proximal edge. Labium: length 1.6, width 1.8, with 40–45 cuspules, most separated by <0.5 × width of a single cuspule. Labio-sternum mounds: joined to sternum. Sternum: length 2.7, width 4.2, with three pairs of sigilla (Fig. 12). Tarsi and metatarsi I–IV ascopulate. Tarsus II somewhat club-shaped. Lengths of legs and palpal segments see table I, legs 4,1,2,3. Thorn-like setae and clubbed setae covering dorsal and lateral surfaces of tibiae, metatarsi, and tarsi I–IV. A single pair of tarsal claws present on tarsi I–IV and the palpal tarsus, each claw with a pointed tooth near its base, ITC present on tarsi I–II. Leg I



Figs. 8–15: *Anisaspoides gigantea* holotype female (BMNH 1896.12.13.71), **8–10** habitus, **8** dorsal view, **9** lateral view (right hand side), **10** ventral view; **11** chelicera and labium, ventral view; **12** labium and sternum, ventral view; **13** ocular tubercle, dorsal view; **14–15** spermathecae, **14** dorsal view, **15** ventral view. Scale bars: **8–10** = 5mm; **11–15** = 1mm.

Table I: *Anisaspoides gigantea* holotype female (BMNH 1896.12.13.71), podomere lengths.

	I	II	III	IV	Palp
Femur	5.7	4.7	4.1	6.2	3.6
Patella	3.7	2.5	2.1	2.5	2.1
Tibia	4.6	3.5	2.9	4.7	2.2
Metatarsus	4.1	3.2	3.6	5.3	–
Tarsus	2.1	2.3	2.0	2.8	2.1
Total	20.2	16.2	14.7	21.5	10.0

stouter than all other legs, femur, patella, and tibia noticeably incrassate. Trichobothria: tibia I d3, II d3, III d6, IV d4, palp d4, metatarsus I d3, II d5, III d5, IV d6. Spination: tibia III v7, d5, metatarsus I v32, II v45, III v30, IV v16, tarsus I d20, II d8, III d12, IV d8, palp d6. Posterior lateral spinnerets with 3 segments, basal 1.9, median 1.0, digitiform apical 1.6, basal and median segments incrassate, apical segment cylindrical, lateral median spinnerets absent. Spermathecae: with two receptacles, basally fused with medial separation, each receptacle with a single circular lobe at its respective apex (Figs. 14–15). Colour: overall alcohol preserved brown (Figs. 8–10).

AFFINITIES: Mud encrusted (Figs. 8–10, 13) on dorsal carapace, opisthosoma, chelicerae, covering most of dorsal and lateral faces of leg and palpal segments also, in addition to the spinnerets. Opisthosoma with three horizontal rows of tubercles on dorsal face, some additional tubercles arranged in a respective row on dorso-retrolateral and dorso-prolateral faces.

DISTRIBUTION: Known only from the type locality, Breves, State of Pará, Brazil.

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