

Descriptions of unknown sexes of Theraphosidae spiders (Mygalomorphae: *Plesiopelma*, *Tmesiphantes*) from northern Argentina

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Abstract: Females previously unknown from two Argentinean tarantula (Theraphosidae), *Plesiopelma paganoi* Ferretti & Barneche, 2014 and *Tmesiphantes crassifemur* (Gerschman & Schiapelli, 1960) are here described. Both specimens were collected at the type locality or very close to it to assure to be conspecific. The female of *P. paganoi* can be distinguished from congeners by the high number of labial and maxillary cuspules and the shape of the spermathecae with very short and non-spiraled ducts. The female of *T. crassifemur* is characterized by the shape of the spermathecae and the absence of spiniform setae on coxa III and IV. New diagnoses and a distribution map for both species are presented.

Key words: Tarantula, spider, taxonomy, female description

Resumen: Descripción de sexos desconocidos de arañas Theraphosidae (Mygalomorphae: *Plesiopelma*, *Tmesiphantes*) del norte de Argentina. Las hembras previamente desconocidas de dos tarántulas argentinas (Theraphosidae), *Plesiopelma paganoi* Ferretti & Barneche, 2014 y *Tmesiphantes crassifemur* (Gerschman & Schiapelli, 1960) son descritas. Ambos especímenes fueron recolectados en la localidad tipo o muy próximas para asegurar la coespecificidad. La hembra de *P. paganoi* se distingue de los congéneres por un mayor número de cúspulas labiales y maxilares y por la forma de la espermateca con ductos muy cortos y no espiralados. La hembra de *T. crassifemur* se caracteriza por la forma de la espermateca y la ausencia de setas espiniformes en las coxas III y IV. Se presentan nuevas diagnósis y un mapa de distribución para ambas especies.

Palabras clave: Tarántula, araña, taxonomía, descripción de la hembra

INTRODUCTION

The family Theraphosidae Thorell, 1869, known as tarantulas, comprises some of the largest spiders in the world, also characterized by their hairy appearance and being charismatic among the popular culture. Most of the mygalomorph diversity is included in this family, with over 1100 species described to date (World Spider Catalog, 2024). Compared to most mygalomorph families, theraphosid diversity is widespread with a near global, but mostly pan-tropical geographic distribution. The subfamily Theraphosinae Thorell, 1869 harbors the highest diversity of the family and is restricted to the Neotropical region (Pérez-Miles & Perafán, 2020). These spiders are characterized by the presence of a dorsal patch of urticating setae on the abdomen that act as an active and passive defense (Pérez-Miles &

Perafán, 2020). In Argentina, there are 48 species representatives of this subfamily that are cited to date (Catálogo de arañas Argentinas, 2024). Some of these species are still known from one sex, such as the cases of representatives of the genera *Euathlus* Ausserer, 1875, *Hapalotremus* Simon, 1903, *Plesiopelma* Pocock, 1901 and *Tmesiphantes* Simon, 1892.

The genus *Plesiopelma* comprises small to medium-sized tarantulas distributed largely in southern South America in Argentina, Bolivia, Brazil, Paraguay and Uruguay, with a doubtful record in Venezuela (World Spider Catalog, 2024). Most species of the genus can be characterized by the presence of long convergent setae at central dorsal abdomen; males differ from the other genera of Theraphosinae in the presence of a small subapical tooth on the bulb (absent in some species) in combination with a retrolateral

basal nodule on metatarsus I (less or well developed); palpal bulb with rounded body, prolateral superior and inferior keels well developed, parallel, close or separated to each other; females of some species differ by the spiral-shaped spermathecae with presence of granules, other species have straight wide ducts (Schiapelli & Gerschman, 1970; Pérez-Miles *et al.*, 1996; Ferretti & Barneche, 2014; Ferretti *et al.*, 2024). The genus have four species formally cited for Argentina: *P. aspidosperma* Ferretti & Barneche, 2014, *P. absconditum* Ferretti, Nicoletta & Soresi, 2024, *P. longisternale* (Schiapelli & Gerschman, 1942) and *P. paganoi* Ferretti & Barneche, 2014. To date, half of these species are known only from males (*P. aspidosperma* and *P. paganoi*). *Plesiopelma paganoi* was described from two adult males captured in northern Argentina, Salta province, inhabiting the Yungas ecoregion (Ferretti & Barneche, 2014).

The genus *Tmesiphantes* comprises small tarantulas distributed in Argentina, Brazil and Peru (World Spider Catalog, 2024). Its representatives are easily recognized by the following combination of characters: few cuspules (less than 30) on the maxillae and labium and femur III incrassate. In addition, males are characterized by the aspect of the tibial spur consisting of two separated (not fused) branches and well-developed retrolateral, which can have a rigid spine on the apex, prolateral branch shorter than retrolateral, and can have an adjacent short spine; and male palpal bulb embolus, which can be twisted or straight, bearing prolateral keels only (superior and inferior); females are characterized by a spermathecae composed of two receptacula with a subapical constriction (Pérez-Miles *et al.*, 1996; Yamamoto *et al.*, 2007; Perafán & Pérez-Miles, 2014; Fabiano-Da-Silva *et al.*, 2019). In Argentina, four species of *Tmesiphantes* are cited, all restricted to the northern region of the country, *T. crassifemur* (Gerschman & Schiapelli, 1960), *T. mutquina* (Perafán & Pérez-Miles, 2014), *T. uru* (Perafán & Pérez-Miles, 2014) and *T. yupanqui* (Perafán & Pérez-Miles, 2014). To date, half of these species are only known from males (*T. crassifemur* and *T. uru*). *Tmesiphantes crassifemur* was originally described under the genus *Melloleitaoina* Gerschman & Schiapelli, 1960 from only one adult male collected in northern Argentina, Salta province, Orán locality, comprising the Yungas ecoregion (Gerschman & Schiapelli, 1960; Perafán & Pérez-Miles, 2014).

A recent survey of theraphosid specimens housed at the Museo Argentino de Ciencias

Naturales “Bernardino Rivadavia”, Buenos Aires, yielded females representatives of *Plesiopelma*, proceeding from the type locality of *P. paganoi* and a female of the genus *Tmesiphantes* geographically very close (25 km) to the type locality of *T. crassifemur*. Thus, in the present work, we present the descriptions and illustrations for the first time of females from *P. paganoi* and *T. crassifemur*. Finally, we conduct new diagnoses to fully include both sexes and a map of the geographic distributions of species treated in this contribution.

MATERIAL AND METHODS

The specimens examined are deposited in the collections of Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” (MACN), and Museo de La Plata (MLP) (Buenos Aires, Argentina).

Abbreviations: ALE, anterior lateral eyes; AME, anterior median eyes; d, dorsal; ITC, inferior tarsal claw; p, prolateral; PI, prolateral inferior keel; PLE, posterior lateral eyes; PLS, posterior lateral spinnerets; PME, posterior median eyes; PMS, posterior median spinnerets; PS, prolateral superior keel; r, retrolateral; STC, superior tarsal claw; v, ventral.

All measurements are given in millimeters and were made with digital dial calipers with an error of 0.01 mm, rounded up to one significant decimal when appropriate. The total lengths do not include chelicerae and spinnerets. Appendage measurements were based on left appendages in dorsal view. Lengths of leg articles were taken from the mid-proximal point of articulation to the mid-distal point of the article (*sensu* Coyle, 1995; Bond, 2012). Images of preserved material were taken with a Leica S APO stereomicroscope with MShot digital coupled camera and stacked using the Helicon Focus Software. Spine notation follows Petrunkevitch (1925).

RESULTS

TAXONOMY

Family **Theraphosidae** Thorell, 1869

Subfamily **Theraphosinae** Thorell, 1869

Genus *Plesiopelma* Pocock, 1901

Plesiopelma paganoi Ferretti & Barneche 2014

Figs. 1, 3

Type material. Holotype male from Argentina, Salta province, General José de San Martín

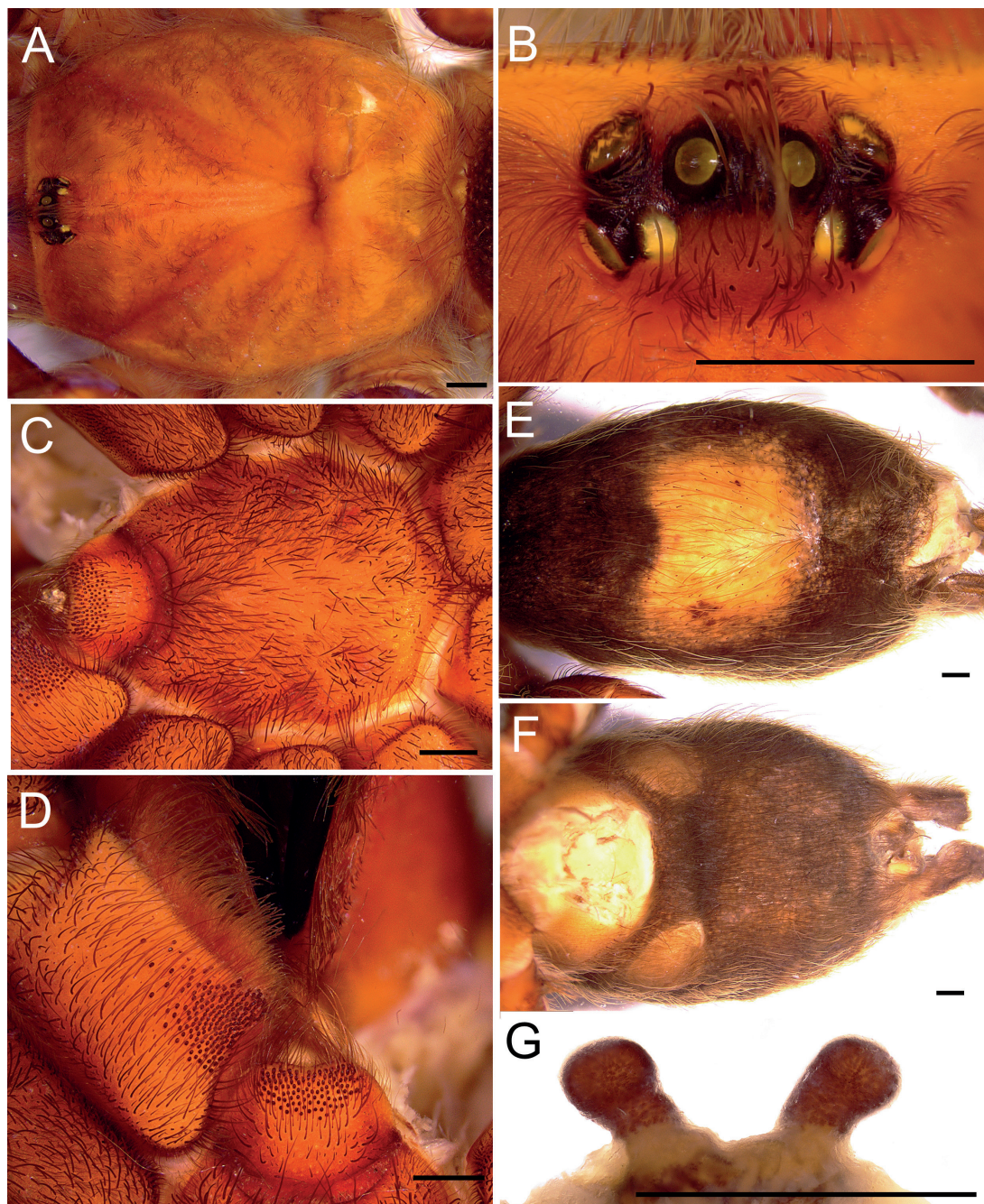


Fig. 1. *Plesiopelma paganoi*, non-type female (MACN-Ar 46333). (A) Carapace, dorsal view; (B) eyes, dorsal view; (C) sternum, ventral view; (D) labium and maxillae, ventral view; (E) abdomen, dorsal view; (F) abdomen, ventral view; (G) spermathecae, dorsal view. Scale bars = 1 mm.

Department: 14 km western of Aguaray locality (22°17'14.11"S, 63°50'11.64"W), collected as juvenile on 24 Jul 2011, molted to adult 22 Sept. 2011, L. Pagano (MLP 19190), not examined. Paratype male from Argentina, Salta province,

General José de San Martín Department: 20 km western of Tartagal locality (22°32'00.34"S, 63°59'39.09"W) collected as juvenile on 2 Dec. 2011, J. Barneche (MLP 19191), not examined.

Additional material examined. Argentina,

Salta province, General José de San Martín Department: Tartagal, 6 Dec.1965, Hett 1♀ (MACN-Ar 46333); same province, department and locality, 5 Dec. 1952, Barrio 1♀ (MACN-Ar 46337); same province, San Ramón de la Nueva Orán Department: La Quena, 14-15 May1983, P. Goloboff 1♀ (MACN-Ar 46240).

Amended diagnosis. *Plesiopelma paganoi* differs from the congeners (except from *P. insulare*) by the high number of labial and maxillary cusps (ranging from 110/130 in labium and up to 195 in maxillae). Males differ from those of *P. insulare* by shape of the palpal bulb, which presents a slender shape, shorter and strongly curved embolus without tooth (see Ferretti & Barneche, 2014). Females of *P. paganoi* additionally are distinguished by the general shape of the spermathecae (excepting *P. insulare*), with non-spiraled wide ducts close to each other and pointing outwards (Fig. 1G). It can be distinguished from *P. insulare* by the longer and curved ducts (short and straight receptacles in *P. insulare*, see Fig. 7 in Lucas & Bücherl, 1973).

Description of non-type female (MACN-Ar 46333).

Color (in ethanol): Carapace and legs, sternum, labium and maxillae reddish brown, (Fig. 1A–F), abdomen dorsally dark brown with yellowish setae on urticating patch (Fig. 1E), ventrally brown with lighter booklungs marks (Figs. 1F). Total length 21.61. Carapace 8.43 long, 7.21 wide. Abdomen 13.18 long, 8.16 wide. Carapace: caput slightly raised. Fovea transverse procurved (Fig. 1A), 1.27 wide. Clypeus narrow, 0.10. Eight eyes arranged in a tubercle (Fig. 1B), 1.10 long, 1.45wide. Anterior eye row procurved, posterior eye row recurved (Fig. 1B). Eye sizes: AME 0.21, ALE 0.31, PME 0.20, PLE 0.30. Eyes interdistances: AME–AME 0.29, AME–ALE 0.21, ALE–ALE 0.92, PME–PLE 0.12, PME–PME 0.62, ALE–PLE 0.22, PLE–PLE 1.03. Chelicerae: 5.00 long, with 10 large teeth on promargin and 27 small denticles on retromargin. Rastellum absent. Labium: 1.43 long, 2.17 wide with 112 rounded cusps (Fig. 1D), on distal half. Labiosternal groove shallow, with pair of sigilla (Fig. 1D). Maxilla with 195/195 (right/left) cusps on basal mound (Fig. 1D). Sternum 4.67 long, 4.54 wide. Three pairs of sigillae, ovals, about one diameter close to margin (Fig. 1C). Legs and palp measurements are shown in Table 1. Spines: palp: tibia 0-2-3v; leg I: femur and patella 0, tibia 0-1-2v, metatarsus 1-0-1v, tarsus 0; leg II: femur and patella 0, tibia 0-1-1proventral, meta-

tarsus 0-1-1v, tarsus 0; leg III: femur and patella 0, tibia 0-2-3v, 1-0-1r, 1-0-1p, metatarsus 2-0-3v, 1-0-1r, 0-0-1p, tarsus 0; leg IV: femur 0-0-1r, patella 0, tibia 1-2-3v, 1-0-1r, 0-0-1p, metatarsus 2-2-3v, 1-0-1r, 0-1-1p, tarsus 0.

Clavate trichobothria in two rows on dorsal tarsi. Claws: ITC absent on all legs. STC: leg I with 2/2 small teeth, leg II with 2/2 small teeth, leg III with 2/2 small teeth and leg IV with 2/2 small teeth.

Scopula: Tarsi of legs I – IV fully scopulate and entire. Metatarsus I fully scopulate and complete, II 1/2 distal scopulate and complete, III 1/3 distal scopulate and complete, IV 1/4 distal scopulate and complete.

Spinnerets: PMS 1.17 long. Basal, middle and apical segments of PLS, 2.37 long, 1.16 long, 2.23 long, respectively.

Spermathecae: ducts not spiraled, long and curved to outwards, subspheric receptacles without lobules (Fig. 1G).

Urticating hairs: Type III present at borders of urticating patch, abdomen dorsum mostly bald, likely due to the urticating setae use or damage.

Distribution. Argentina, northeastern Salta province, close to the southern limit of Bolivia (Fig. 3).

Genus *Tmesiphantes* Simon, 1892

Tmesiphantes crassifemur (Gerschman &

Schiapelli, 1960)

Figs 2–3

Type material. Holotype male from Argentina, Salta province, San Ramón de la Nueva Orán Department: Urundel, 335m above sea level, (ca. 23°33'0"S, 64°25'0"W), Aug. 1947, Misión Ricardo N. Orfila (MACN-Ar 2285).

Additional material examined. Argentina, Salta province, San Ramón de la Nueva Orán Department: La Quena, 15-15 May 1983, P. Goloboff 1♀ (MACN-Ar 46240).

Amended diagnosis. Males differ from congeners by the presence of a pronounced curvature on the palpal bulb with a triangular keel below the PS and PI keels (Perafán & Pérez-Miles, 2014; Fabiano-Da-Silva *et al.*, 2019). Female resembles to that of *T. yupanquii* in the shape of the spermathecae with very short receptacles and large granules (Fig. 2G), but is distinguished by the apical chambers of receptacles more oval and larger than the ducts, and absence of spiniform setae on promargin coxa III and IV (present in *T. yupanqui*).

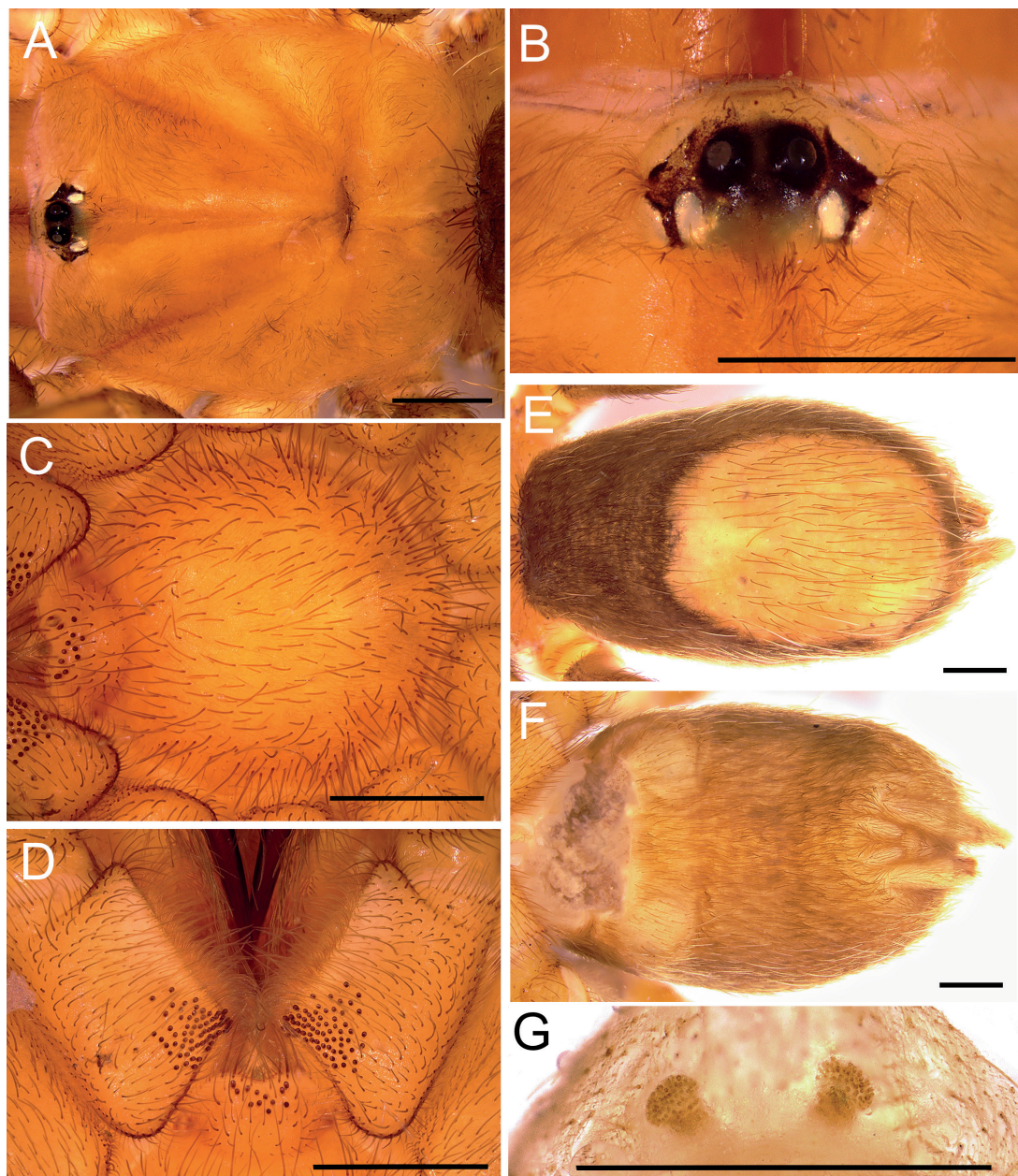


Fig. 2. *Tmesiphantes crassifemur*, non-type female (MACN-Ar 46240). (A) Carapace, dorsal view; (B) eyes, dorsal view; (C) sternum, ventral view; (D) labium and maxillae, ventral view; (E) abdomen, dorsal view; (F) abdomen, ventral view; (G) spermathecae, dorsal view. Scale bars = 1 mm.

Description of non-type female (MACN-Ar 46240).

Color (in ethanol): Carapace and legs, sternum, labium and maxillae light brown (Fig. 2A–D), abdomen dorsally dark brown with yellowish setae on a large urticating patch (Fig. 2E), ventrally light brown (Fig. 2F). Total length 8.81.

Carapace 3.88 long, 3.29 wide. Abdomen 4.93 long, 2.91 wide. Carapace: caput slightly raised. Fovea transverse procurved (Fig. 2A), 0.56 wide. Clypeus absent. Eight eyes arranged in a tubercle (Fig. 2B), 0.43 long, 0.71 wide. Anterior eye row slightly procurved, posterior eye row slightly recurved (Fig. 2B). Eye sizes: AME 0.08, ALE

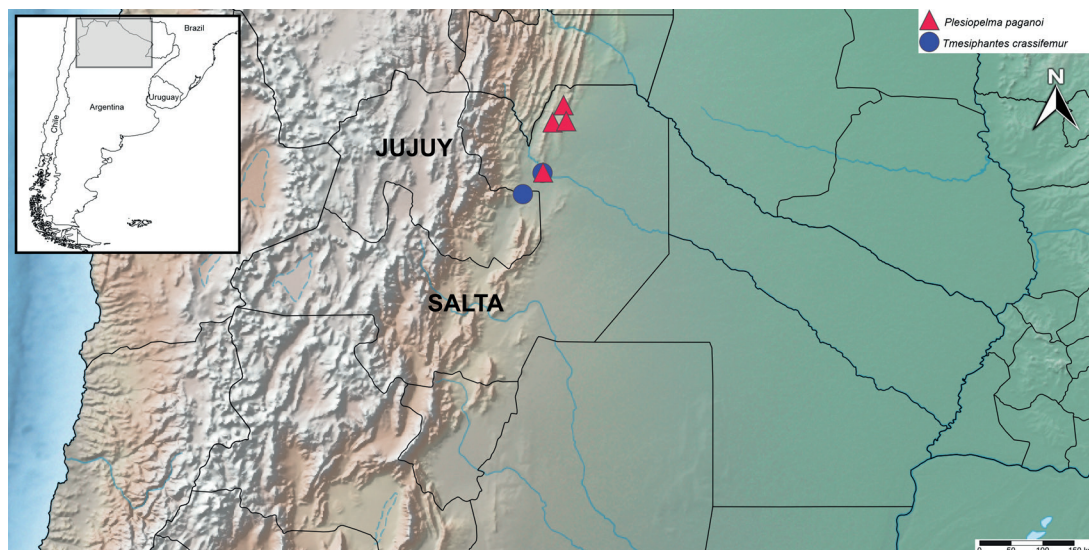


Fig. 3. Distribution map of *Plesiopelma paganoi* and *Tmesiphantes crassifemur*.

0.22, PME 0.13, PLE 0.11 Eyes interdistances: AME–AME 0.15, AME–ALE 0.07, ALE–ALE 0.46, PME–PLE 0.03, PME–PME 0.31, ALE–PLE 0.05, PLE–PLE 0.52. Chelicerae: 2.00 long, with 9 large teeth on promargin and 10 small denticles on retromargin. Rastellum absent. Labium: 0.43 long, 0.85 wide with 13 rounded cuspules (Fig. 2C–D), on distal half. Labiosternal groove barely visible. Maxilla with 70/70 (right/left) cuspules on basal mound (Fig. 2D). Sternum 1.73 long, 1.85 wide. Two pairs of visible sigillae, ovals, about one diameter close to margin. Legs and palp measurements are shown in Table 2. Spines: palp: femur, patella 0, tibia 0-1-3(ap)v, tarsus 0; leg I: femur, patella and tibia 0, metatarsus 1-0-1v, tarsus 0; leg II: femur, patella and tibia 0, metatarsus 0-1-2(ap)v, tarsus 0; leg III: femur and patella 0, tibia 0-0-2(ap)v, 1-1-0r, 0-2-0p, metatarsus 2-3-3v, 0-1-1r, 1-1-1p, tarsus 0; leg IV: femur and patella 0, tibia 1-2-3v, 1-1-0r, metatarsus 1-3-3v, 1-1-1r, 0-1-1p.

Clavate trichobothria in two rows on dorsal tarsi. Claws: ITC absent on all legs. STC: leg I with 1/2 small teeth, leg II with 1/0 small teeth, leg III with 1/0 small teeth and leg IV with 1/3 small teeth.

Scopula: Tarsi of legs I–IV fully scopulate, entire. Metatarsus I and II 1/3 scopulate, III and IV without scopula.

Spinnerets: PMS 0.40 long. Basal, middle and apical segments of PLS, 0.70 long, 0.38 long, 0.24 long, respectively.

Spermathecae: very short and straight ducts with oval receptacles and large granules (Fig. 2G).

Urticating hairs: not observed, abdomen dorsum mostly bald, likely due to the urticating setae use or damage

Distribution. Argentina, northern Salta province, close to the limit of Jujuy province (Fig. 3).

DISCUSSION

Plesiopelma paganoi was described based on two juveniles (they reached adulthood in laboratory conditions) collected at the high cloud forests at Yungas region of Salta province (Ferretti & Barneche, 2014). At the same work, authors published another new representative of *Plesiopelma*, *P. aspidosperma* for the dry Chaco region, located eastern at Salta province, which is also known only from males. Thus, a logic question arises about that the female described as *P. paganoi* in the present contribution is conspecific. To unveil this issue, we relied on two evidences to match the specimens: one came from the morphological affinities, such as the body size (large total length in *P. paganoi*) and the higher number of labial and maxillary cuspules in males of *P. paganoi* vs. *P. aspidosperma*, which is also observed in the females examined here. The habitat characteristics also seem to be relevant to differentiate these two taxa, since *P. aspidosperma* is restricted to the extremely dry environments that characterized the Dry Chaco region (Ferretti & Barneche, 2014; Allegue *et al.*, 2023). Contrarily, *P. paganoi* could be associated with more humid habitats at Yungas region given the different localities recorded.

Table 1. Legs and palp measurements expressed in millimeters of *P. paganoi* non-type female (MACN-Ar 46333).

	I	II	III	IV	Palp
Femur	5.53	5.39	5.26	5.83	4.35
Patella	3.17	2.99	3.21	3.12	2.47
Tibia	4.22	3.80	4.09	4.77	2.72
Metatarsus	3.83	3.55	3.57	5.10	-
Tarsus	2.31	2.37	2.34	2.89	2.33
Total	19.06	18.1	18.47	21.71	11.87

Table 2. Legs and palp measurements expressed in millimeters of *T. crassifemur* non-type female (MACN-Ar 46240).

	I	II	III	IV	Palp
Femur	2.32	2.08	1.93	2.55	1.94
Patella	1.64	1.29	1.25	1.34	1.24
Tibia	1.88	1.45	1.31	2.19	1.18
Metatarsus	1.27	1.25	1.75	2.66	-
Tarsus	1.01	1.08	1.10	1.44	1.11
Total	8.12	7.15	7.34	10.18	5.47

Tmesiphantes crassifemur was originally described by Gerschman & Schiapelli (1960) as the type species of the genus *Melloleitaoina* from a male located in Urundel, San Ramón de la Nueva Orán, Salta province in Yungas region, northern Argentina. Recently, the genus *Melloleitaoina* was synonymized with *Tmesiphantes* (Fabiano-Da-Silva *et al.*, 2019). The female of *T. crassifemur* was described thirteen years after the original description of the male. However, Perafán & Pérez-Miles (2014) noticed that this female was not conspecific with the male of *T. crassifemur* but comprised a new species, *T. uru*, known from males and females inhabiting the transition area among the Yungas and the Dry Chaco at north-eastern Salta province. The female described in this work as *T. crassifemur* is located at the locality of La Quena, Salta province, which is less than 20 km away from the type locality of the male holotype. Moreover, the female showed a distinguishable shape of the spermathecae, with very short receptacles and large granules that clearly differs from that of *T. uru*, the geographically closest species.

The present contribution described for the first time the unknown conspecific sexes of two tarantula species from northern Argentina clarifying their taxonomic status, geographic distribution and providing complementary information to the theraphosid diversity in the country.

ACKNOWLEDGMENTS

Thanks to Martín Ramírez and Cristian Grismado for the loan of specimens from the MACN-Ar. Thanks to the Agencia de Investigación I+D+I for the funds through the grant PICT 2021-0407 and to the Secretaría General de Ciencia y Técnica, Universidad Nacional del Sur through the grant 24/ZB87.

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Doi: 10.22179/REVMACN.27.890

Recibido: 20-IV-2025

Aceptado: 10-VI-2025