

Description of two new species of *Plesiopelma* (Araneae, Theraphosidae, Theraphosinae) from Argentina

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ABSTRACT. Two new species of *Plesiopelma* Pocock, 1901 from northern Argentina are described and diagnosed based on males and habitat descriptions are presented. Males of *Plesiopelma paganoi* sp. nov. differ from most of species by the absence of spiniform setae on the retrolateral face of cymbium, aspect of the palpal bulb. *Plesiopelma aspidosperma* sp. nov. differs from most species of the genus by the presence of spiniform setae on the retrolateral face of cymbium and it can be distinguished from *P. myodes* Pocock, 1901, *P. longisternale* (Schiapelli & Gerschman, 1942) and *P. rectimanum* (Mello-Leitão, 1923) by the separated palpal bulb keels and basal nodule of metatarsus I very developed. It differs from *P. minense* (Mello-Leitão, 1943) by the shape of the palpal bulb and basal nodule on metatarsus I well developed. Specimens were captured in Salta province, Argentina, inhabiting **high cloud forests of Yungas** eco-region.

KEYWORDS. Taxonomy, spiders, natural history, Neotropical, Yungas.

RESUMEN. Descripción de dos nuevas especies de *Plesiopelma* (Araneae, Theraphosidae, Theraphosinae) de Argentina. Dos nuevas especies de *Plesiopelma* Pocock, 1901 del norte de Argentina son diferenciadas y se describen en base a ejemplares machos y se presentan descripciones de los ambientes. Machos de *Plesiopelma paganoi* sp. nov. difieren de la mayoría de las especies por la ausencia de setas espiniformes en la cara retrolateral del cymbium, por la forma del órgano palpar. *Plesiopelma aspidosperma* sp. nov. difiere del resto de las especies por la presencia de setas espiniformes en la cara retrolateral del cymbium y se distingue de *P. myodes* Pocock, 1901, *P. longisternale* (Schiapelli & Gerschman, 1942) y *P. rectimanum* (Mello-Leitão, 1923) por las quillas del bulbo separadas y el nódulo basal del metatarso I muy desarrollado. Se diferencia de *P. minense* (Mello-Leitão, 1943) por la forma del órgano palpar y el nódulo basal del metatarso I desarrollado. Los especímenes se capturaron en la provincia de Salta, Argentina, habitando nuboselvas de altura en la eco-región de Yungas.

PALABRAS-CLAVE. Taxonomía, arañas, historia natural, Neotropical, Yungas.

Theraphosidae is a family of spiders comprising the largest known specimens in the world, with 950 described species in 124 genera constituting the most speciose family of the Mygalomorphae (PLATNICK, 2013). They are distributed throughout all tropical and many subtropical areas, mainly in Neotropical, Ethiopian, Oriental and Australian regions, with a few species in Europe (MIGLIO *et al.*, 2013). Most of the known species inhabit the Neotropics and are included in the Theraphosinae, endemic to this region. Very little is known about the biology of the Theraphosidae and due to the homogeneity of theraphosinae morphology and the scarcity of taxonomic characters, its taxonomy is in a chaotic state (RAVEN, 1990; PÉREZ-MILES *et al.*, 1996; BERTANI, 2000). Despite the progress in the taxonomy of Theraphosidae in the last twenty years, much is yet to be done (BERTANI *et al.*, 2012; MIGLIO *et al.*, 2013).

The genus *Plesiopelma* Pocock, 1901 comprises nine species recorded in Argentina, Brazil, Paraguay, Uruguay and Venezuela (PLATNICK, 2013). The type species, *Plesiopelma myodes* Pocock, 1901 was described by original designation and monotypy based on a male specimen from Uruguay. PIZA (1976) described *Plesiopelma imperatrix* based on a female from Brazil, but with unknown locality. This species exhibit some diagnostic characters, such as presence of urticating hairs type I, femur III incrassate and spermathecae with one single receptacle that belong to other theraphosid genus (PÉREZ-MILES *et al.* 1996, NAGAHAMA, unpublished data) and will be

not considered for comparisons in this study. PÉREZ-MILES *et al.* (1996) considered *Plesiopelma* as a senior synonym of *Ceropelma* Mello-Leitão, 1923, containing at that time five species: *C. flavohirtum* (Simon, 1889), *C. semiaurantiacum* (Simon, 1897), *C. insularis* Mello-Leitão, 1923, *C. longisternalis* Schiapelli & Gerschman, 1942 and *C. gertschi* Capocariacco, 1955. *Plesiopelma flavohirtum* was transferred to *Catanduba* by YAMAMOTO *et al.* (2012). *Plesiopelma semiaurantiacum* was described by SIMON (1897) based on a male and female from Colonia Risso, Paraguay. Then, MELLO-LEITÃO (1923a) described *Plesiopelma insulare* based on a male from Ilha de Alcatrazes, state of São Paulo, Brazil. In this same work, the author described *Hapalopus rectimanum*, later transferred to *Plesiopelma* by PÉREZ-MILES *et al.* (1996). *Plesiopelma longisternale* was established by SCHIAPELLI & GERSCHMAN (1942) based on a male specimen from Campo Gallo, Santiago del Estero Province, Argentina. This is the only species recorded for Argentina (SCHIAPELLI & GERSCHMAN, 1942; PLATNICK, 2013) with a wide distribution, comprising the provinces of Buenos Aires, Catamarca, Chaco, Córdoba, Corrientes, Entre Ríos, La Pampa, La Rioja, Mendoza and Santiago del Estero. Later, CAPOCARIACCO (1955) described *Plesiopelma gertschi* from a female of Barcelona, Anzoátegui, Venezuela, significantly expanding the geographical distribution of the genus. YAMAMOTO *et al.* (2007) transferred *Tmesiphantes physopus* Mello-Leitão, 1926 and *T. minensis* Mello-Leitão, 1943 to *Plesiopelma*. *Plesiopelma physopus* was

described by MELLO-LEITÃO (1926) based on a male from Campina Grande, state of Paraíba, Brazil, but the type material is probably lost (YAMAMOTO *et al.*, 2007). Finally, NAGAHAMA (unpublished data presented a revision and cladistic analysis of the genus *Plesiopelma* for his M.Sc. thesis dissertation. Unfortunately, according to the International Code of Zoological Nomenclature (articles 8 and 9, chapter 3, 4th edition) any proposal of nomenclatural changes and/or designation of types or type localities on a dissertation work are not valid as a publication (ICZN, 1999). However, the contribution of NAGAHAMA (unpublished data) allowed us to make comparisons of our material with the description and illustrations of the taxa treated in its work.

In a recent survey carried out in northern Salta province, Argentina, two new species of *Plesiopelma* were discovered and are herein described, diagnosed and some aspects on natural history are presented.

MATERIAL AND METHODS

The following abbreviations are utilized: ALE = anterior lateral eyes; AME = anterior median eyes; BN = basal nodule; D = dorsal; P = proteral; PB = proteral branch of tibial apophysis; PI = proteral inferior keel; PLE = posterior lateral eyes; PLS = posterior lateral spinnerets; PME = posterior median eyes; PMS = posterior median spinnerets; PS = proteral superior keel; R = retrolateral; RB = retrolateral branch of tibial apophysis. Female genitalia was dissected and cleared in concentrated lactic acid for 60-120 minutes to study the shape of spermathecae. All measurements are given in millimeters and were made with digital dial calipers with an error of 0.01mm, rounded up to one significant decimal where appropriate and an Olympus stereoscopic microscope equipped with a calibrated ocular micrometer scale. Photographs of preserved material were taken with a SONY Hx200v. The material studied are deposited in the arachnological collection of the Museo de La Plata (MLP, Luis Pereira), Buenos Aires, Argentina and Laboratorio de Zoología de Invertebrados II, Universidad Nacional del Sur (LZI, Nelson Ferretti), Bahía Blanca, Argentina. Spine notation follows PETRUNKEVITCH (1925). Male palpal bulb keel terminology follows BERTANI (2000). Urticating setae terminology follows COOKE *et al.* (1972).

RESULTS AND DISCUSSION

Plesiopelma Pocock, 1901

Plesiopelma POCK, 1901:553; PETRUNKEVICH, 1911:85 (catalog); PÉREZ-MILES *et al.*, 1996:55 (removed from the synonymy of *Citharacanthus*).

Citharacanthus POCK, 1901:551; PÉREZ-MILES *et al.*, 1996:46 (*in part*).

Dryptopelma SIMON, 1889:402 (*in part*).

Eurypelma C. L. KOCH, 1850:70 (*in part*); ROEWER, 1942:240 (*in part*); BRIGNOLI, 1983:137 (*in part*).
Ceropelma MELLO-LEITÃO, 1923b:175; PÉREZ-MILES *et al.*, 1996:55 (synonymized with *Plesiopelma*).

Type species: *P. myodes* Pocock, 1901, defined by monotypy.

Diagnosis. Differs from other theraphosids, except from some species of *Homoeomma*, 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 *P. paganoi* sp. nov. and *P. aspidosperma* sp. nov., in combination with a retrolateral basal nodule on metatarsus I (less or well developed). Palpal bulb with rounded body, proteral superior and inferior keels well developed, parallel, close or separated to each other. Females differ by the spiral-shaped spermathecae with presence of granules.

Other material examined. *Plesiopelma longisternale* (Schiapelli & Gerschman 1942), 3♂, X.2009, Sierra de la Ventana, Buenos Aires, Argentina (37°08'13"S, 61° 57'25"W), N. Ferretti & S. Copperi leg. (LZI 0074, 0075, 0076); ♂, V.2006, Las Gaviotas, Caleu Caleu, La Pampa, Argentina (38°45'S, 63°45'W), R. Tizón leg. (LZI 0082).

Plesiopelma paganoi sp. nov.

(Figs 1-6; Tab. I)

Type material. Holotype ♂, Argentina, Salta, Department of San Martín, at about 14 km western of Aguaray locality (22°17'14.11"S, 63°50'11.64"W), collected as juvenile on 24.VII.2011, molted to adult 22.IX.2011, L. Pagano leg. (MLP 19190). Paratype ♂, Argentina, Salta, San Martín, at about 20 km western of Tartagal locality (22°32'00.34"S, 63°59'39.09"W) collected as juvenile on 2.XII.2011, J. Barneche leg. (MLP 19191).

Etymology. The specific name is a patronym in honor of Luis G. Pagano, Argentinean ornithologist who participated in the collection of this new species.

Diagnosis. *Plesiopelma paganoi* sp. nov. differs from most of *Plesiopelma* species, except from *P. insulare*, by the high number of labial and maxillary cuspules (more than 130) and absence of spiniform setae on the retrolateral face of cymbium. It differs from *P. insulare* by the aspect of the palpal bulb, which presents a slender shape, shorter and strongly curved embolus with tooth absent.

Tab. I. *Plesiopelma paganoi* sp. nov., length of leg and palpal segments of male.

	I	II	III	IV	Palp
Femur	10.9	11.0	9.1	11.8	7.1
Patella	5.8	6.2	4.9	5.5	4.4
Tibia	8.3	8.4	6.8	7.8	6.0
Metatarsus	9.4	7.9	7.8	10.6	-
Tarsus	5.9	5.4	5.3	6.4	2.4
Total	40.3	38.9	33.9	42.1	19.9



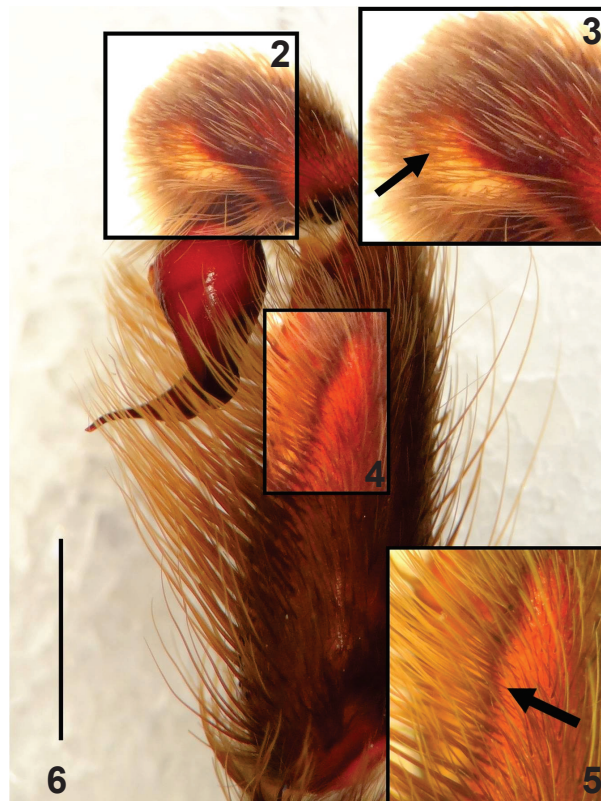
Fig. 1. *Plesiopelma paganoi* sp. nov., male paratype (MLP 19191), habitus. Scale: 1 cm.

Description. Color *in vivo* (male paratype, MLP 19191): carapace and legs dorsally black with whitish setae on carapace border, coxae and trochanters. Abdomen dorsally black with reddish setae (Fig. 1). Male holotype (MLP 19190): specimen lost most of urticating hairs, abdomen dorsal area is nearly bare, some urticating setae type III were observed. Total length (not including chelicerae or spinnerets) 29.1. Cephalothorax 14.9 long (Fig. 2), 12.1 wide. Abdomen 15.0 long, 7.3 wide. Spinnerets: PMS, 1.1 long, 0.4 wide; PLS, 1.5 basal, 2 middle, 2.4 domed distal. Eyes: tubercle length 1.5, width 1.8. Clypeus narrow, 0.6. Anterior eyes row procurved, posterior row recurved. Eyes sizes and interdistances: AME 0.29, ALE 0.44, PME 0.22, PLE 0.36, AME – AME 0.34, AME – ALE 0.29, PME – PME 0.77, PME – PLE 0.14, ALE – PLE 0.28. Fovea transverse, deep procurved, 1.9 wide. Labium length 2.0, width 1.6, with 137 cuspules. Maxillae each with 187 cuspules spread over internal face. Sternum: length 6.2, width 3.6. Chelicerae with 10 large teeth on promargin, group of 21 smaller basal teeth behind promarginal line. Length of legs and palpal segments in Tab. I. Tarsi I – IV densely scopulate, scopula I – III entire, IV divided by lines of setae increasing in width from apical (3 – 4 setae) to basal (10 – 12 setae). Metatarsi I fully scopulate, II 2/3 apical scopulate, III 1/2 apical scopulate, IV 1/4 apical scopulate. Spinination: femora of I and IV, 1 D; femora II and III and patellae of I – IV and palp, 0. Tibiae: palp 2 P; I 1 V, 1 P, 1 R; II 2, 1 – 1 P; III 1 – 1 – 2 V, 1 – 1 P, 1 – 1 R; IV 1 – 2 V, 1 – 1 R, 1 – 1 P. Metatarsi: I 1 V; II 1 V; III 1 – 1 – 1 V, 1 – 1 – 2 P, 1 – 1 R; IV 1 – 1 – 1 V, 1 – 1 – 1 P, 1 – 1 R. Tarsi I – IV, palps 0. Absence

of spiniform setae on the retrolateral face of cymbium and palpal tibia (Fig. 3). Tibia I with ventral apophysis formed by two branches (Fig. 4): prolateral smaller, with a basal megaspine and 9 short spines on inner face; retrolateral larger with a subapical megaspine and 12 short spines on inner face, these arranged in two rows. Metatarsus of leg I with basal rounded nodule not well developed (Fig. 4) and flexes between both branches of tibial apophysis, touching their medial portion. Male palpal bulb with main body elongated, narrowed, with well-developed PI and PS, close and parallel to each other (Figs 5, 6). Embolus short with strong and pronounced curvature and tip thick. Subapical tooth en embolus absent.

Distribution. Northern Salta province, Argentina, next to the southern limit of Bolivia (Fig. 17).

Habitat description. *Plesiopelma paganoi* sp. nov. was found only in high cloud forest in the Yungas eco-region. This region comprises one of the most diverse ecosystems in Argentina (CABRERA, 1976; CABRERA & WILLINK, 1980). This high cloud forest represents less than 2% of the Argentinean territory but contains even 50% of the known biodiversity. The vegetation is distinguished by floors or stripes of well differentiate physiognomic characteristics. A juvenile specimen was found at the piedmont jungle inhabiting in small crevices under decomposing logs (Fig. 7), a



Figs 2-6. *Plesiopelma paganoi* sp. nov., male holotype (MLP 19190): 2, carapace, dorsal; 3, palp, retrolateral (arrows show the absence of spiniform setae on tibia and cymbium); 4, tibial apophyses, ventral; 5, 6, copulatory bulb prolateral and retrolateral respectively. Scale: 1 mm.



Figs. 7-8. *Plesiopelma paganoi* sp. nov. in Yungas region: 7, habitat of holotype male; 8, habitat of paratype male.

microhabitat shared with specimens of an undetermined species of *Acanthoscurria* (Jorge Barneche, pers. obs.). The other juvenile was captured walking at about 11-12 p.m. between shrubs next to a path and a dry river (Fig. 8). In this habitat, also specimens of *Grammostola* sp., *Melloleitaoina crassifemur* Gerschman & Schiapelli, 1960 (Theraphosidae) and *Diplura* sp. (Dipluridae) can be found (Jorge Barneche, pers. obs.). The piedmont jungle occupies the altitudinal level of about 400 and 700 m.a.s.l. represented by valleys, plains and hills. It has been proposed that this jungle constitutes a “biogeographic relict” due to ancient connections with other South American seasonal forests, such as Caatinga in Brazil (PRADO, 2000; MORRONE, 2006). Moreover, this area harbors a high percentage of exclusive species (about 30% of the total species) and some of the characteristic trees species are *Calycophyllum multiflorum* (Palo blanco) and *Phyllostylon rhamnoides* (Palo amarillo).

Plesiopelma aspidosperma sp. nov.

(Figs 9-15; Tab. II)

Type material. Holotype ♂, Argentina, Salta, Department of Rivadavia, at about 28 km eastern of Fuente de Aguirre locality (24°08'30.77"S, 62°39'38.35"W), 17.XI.2011, J. Barneche leg. (MLP 19192).

Etymology. The species is named to the genera of an emblematic tree from the eastern Salta province, Argentina, *Aspidosperma*, known as “quebracho blanco” in Spanish. The characteristic species in the area is *Aspidosperma quebracho-blanco* (Schltr.) Lyons. It is medically important due to an extract obtained from the bark known as “yohimbe”, used around the world to treat asthma, lung disorders, coughs, fevers and other conditions. The specimen of *P. aspidosperma* was located near to a group of trees of this species.

Diagnosis. *Plesiopelma aspidosperma* sp. nov. differs from *P. insulare* by spiniform setae on the retrolateral face of cymbium. It can be distinguished from *P. myodes*, *P. longisternale* and *P. rectimanum* by the separated palpal bulb keels and basal nodule of metatarsus I very developed. It differs from *P. minense*

by embolus tooth absent, embolus slender and curved and basal nodule on metatarsus I more developed.

Description. Color *in vivo* (male holotype, MLP 19192): carapace and legs dorsally dark with pinkish setae on carapace border, coxae and trochanters. Abdomen dorsally black with few reddish setae and orange setae on spinnerets (Fig. 9). Urticating setae type III and IV present. Total length (not including chelicerae or spinnerets) 16.4. Cephalothorax 8.4 long (Fig. 10), 6.1 wide. Abdomen 8.0 long, 3.6 wide. Spinnerets: PMS, 0.4 long, 0.2 wide; PLS, 0.7 basal, 1.1 middle, 1.3 domed distal. Eyes: tubercle length 0.7, width 0.9. Clypeus narrow, 0.1. Anterior eyes row procurved, posterior row recurved. Eyes sizes and inter-distances: AME 0.19, ALE 0.13, PME 0.12, PLE 0.12, AME – AME 0.16, AME – ALE 0.08, PME – PME 0.44, PME – PLE 0.03, ALE – PLE 0.12. Fovea transverse, deep, highly procurved, 0.8 wide. Labium length 0.9, width 0.7, with 44 cuspules. Maxillae each with 77 cuspules spread over internal face. Sternum (Fig. 11): length 3.4, width 1.9. Chelicerae with 10 large teeth on promargin, group of 13 smaller basal teeth behind promarginal line. Length of legs and palpal segments in Tab. II. Tarsi I – IV densely scopulate, scopula I entire, II – III divided by narrow line of setae, IV divided by wide line of 4 setae. Metatarsi I 3/4 distal scopulate, II 2/3 apical scopulate, III 1/2 apical scopulate, IV 1/3 apical scopulate. Spinination: femora of I, III and palp, 1 D; femora II and IV and patellae of I – IV and palp, 0. Tibiae: palp 2 – 1 D; I 2 – 1 – 2 V, 1 – 1 P; II 1 – 2 – 2 V, 1 – 1 R; III 1 – 2 – 2 V, 1 – 1 R, 1 P; IV 2 – 2 – 2 V, 1 – 1 P. Metatarsi: I 1 V; II 1 – 1 V; III 1 – 1 – 3 V, 1 – 1

Tab. II. *Plesiopelma aspidosperma* sp. nov., length of leg and palpal segments of male.

	I	II	III	IV	Palp
Femur	5.8	5.1	4.5	5.4	3.5
Patella	3.6	2.7	2.1	2.7	2.4
Tibia	4.7	4.4	3.9	4.9	3.1
Metatarsus	4.2	4.5	3.5	5.5	-
Tarsus	3.6	2.8	3.0	3.9	1.2
Total	21.9	19.5	17.0	22.4	10.2



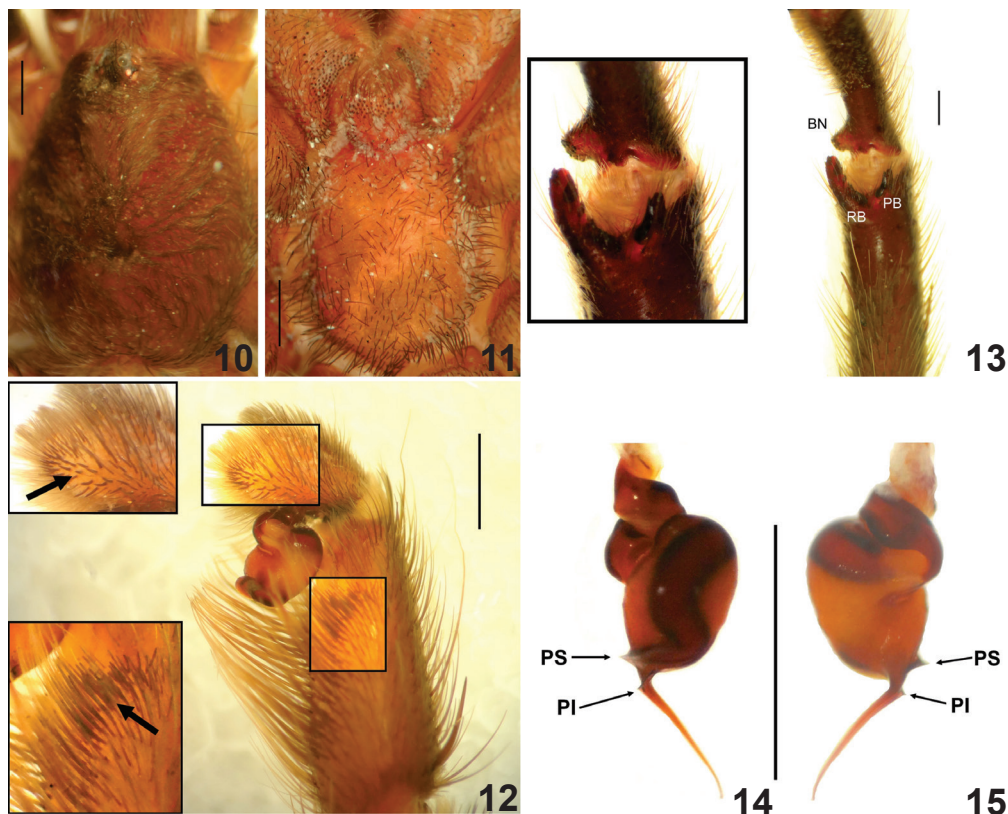
Fig. 9. *Plesiofelma aspidosperma* sp. nov., holotype male (MLP 19192), habitus. Scale: 1 cm.

P, 1 R; IV 1 – 1 – 1 – 1 – 2 V, 1 – 1 P, 1 – 1 R. Tarsi I – IV, palps 0. Retrolateral face of palp tibia with a group of thickened setae. Retrolateral face of cymbium bearing spiniform setae (Fig. 12). Character used by FUKUSHIMA

et al. (2005) and FUKUSHIMA *et al.* (2008) and shared by *Cyriocosmus elegans*. Tibia I with ventral apophysis formed by two branches (Fig. 13): prolateral smaller, with a basal megaspine on inner face; retrolateral larger with a subapical megaspine, one smaller apical spine and 8 short spines on inner face, these arranged in two rows. Metatarsus of leg I with basal rounded nodule well developed (Fig. 13) and flexes between both branches of tibial apophysis, touching their medial portion. Male palpal bulb piriform, tapering abruptly, with well developed PS and less developed PI, not parallel to each other (Figs 14, 15). Noticeably constriction between the bulb body and embolus. Embolus very long (almost half of the total bulb length) and slender. Subapical tooth on embolus absent.

Distribution. Known only from the type locality, in western Salta province, Argentina (Fig. 17).

Habitat description. *Plesiofelma aspidosperma* sp. nov. was found only in the Semiarid Chaco ecoregion at eastern Salta province. In Argentina, this region extends in the provinces of Formosa, Chaco, Santiago del Estero, northern Córdoba and the oriental portion of Salta. The topography comprises plains, mountains and forests, becoming more arid from East to West. The climate is temperate and subtropical with a mean annual temperature of 22°C and means annual precipitations of about 500 – 700 mm (NAUMANN, 2006). The jungles are dominated by xeric vegetation (GIMÉNEZ & MOGLIA, 2003). The characteristic vegetation corresponds to



Figs. 10-15. *Plesiofelma aspidosperma* sp. nov., male holotype (MLP 19192): 10, carapace, dorsal; 11, sternum, ventral; 12, palp, retrolateral (arrows show the spiniform setae on tibia and cymbium); 13, tibial apophyses, ventral; 14, 15, copulatory bulb prolateral and retrolateral respectively. Scale: 1 mm.



Fig. 16. *Plesiopelma aspidosperma* sp. nov. in semidry Chaco region, habitat of holotype male.

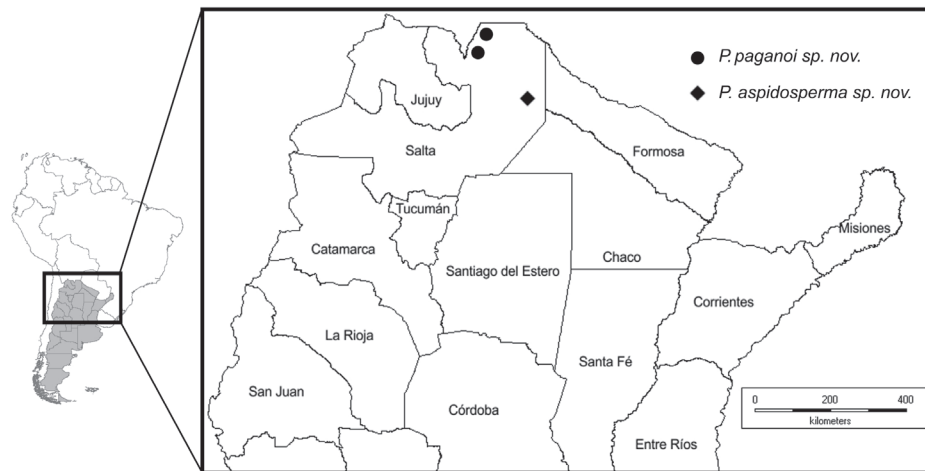


Fig. 17. Distribution map of *Plesiopelma* new species.

forests of *Schinopsis lorentzii* as dominant species together with *Aspidosperma quebracho-blanco*. Also, other tree species such as *Zizyphus mistol*, *Prosopis alba*, *Prosopis nigra*, *Celtis tala*, *Geoffroea decorticans* and *Cercidium praecox* are present (NAUMANN, 2006). Some of the characteristic shrubs that can be found in this area comprise: *Mimosa detinens*, *Condalia microphylla*, *Maytenus spinosa*, *Atamisquea emarginata*, *Acacia furcatispina* and *Celtis chichape*. Some specimens of *Opuntia quimilo* and *Stetsonia coryne* are present in this area (NAUMANN, 2006). The adult male of *P. aspidosperma* was found walking at about 7-8 p.m. in a sandy path, surrounded by *Stetsonia coryne* “cardones” and *Aspidosperma quebracho-blanco* (Fig. 16). In this habitat, also specimens of *Grammostola* sp., *Acanthoscurria* sp. (Theraphosidae) and *Idiops clarus* (Mello-Leitão, 1946) (Idiopidae) can be found (Jorge Barneche, pers. obs.).

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