

Revision of the monotypic genus *Chinchaysuyu* Ferretti et al., 2023 from Peru (Araneae; Theraphosidae; Theraphosinae)

Revisión del género monotípico *Chinchaysuyu* Ferretti et al., 2023 de Peru (Araneae; Theraphosidae; Theraphosinae)

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Abstract

The Peruvian tarantula genus *Chinchaysuyu* Ferretti et al., 2023 is revised. Another female specimen of *Chinchaysuyu spinosa* Ferretti et al., 2023 was found in the distribution area of this species. The female has two short hypersclerotized seminal receptacles. Two pairs of seminal receptacles of female paratype of *Chinchaysuyu spinosa* are considered an anomaly. Homologous keels of male palpal bulb are newly proposed. The genus *Chinchaysuyu* is rediagnosed, differing from all known genera in the presence of type III urticating setae placed in one dorsal patch on abdomen, in combination with the palpal bulb with prolateral superior, prolateral inferior, subapical keel and the non-homologous ventral keel, subparallel with subapical keel and prolateral keels, in the presence of spiniform setae on ventral maxillae, the reduced number of labial cuspules, the presence of long spiniform setae retrolateral on male cymbial lobe, and the female spermatheca consisting of two separate hypersclerotized receptacles.

Resumen

Se revisa el género de tarántula peruana *Chinchaysuyu* Ferretti et al., 2023. Se encontró otro ejemplar hembra de *Chinchaysuyu spinosa* Ferretti et al., 2023 en el área de distribución de esta especie. La hembra tiene dos receptáculos seminales cortos e hiperesclerotizados. Se considera una anomalía la presencia de dos pares de receptáculos seminales del paratipo femenino de *Chinchaysuyu spinosa*. Las quillas homólogas del bulbo palpal del macho son redescritas. Se presenta un nuevo diagnóstico del género *Chinchaysuyu*, que lo diferencia de los otros géneros conocidos; las diferencias son por la presencia de setas urticantes tipo III ubicadas en un parche dorsal en el abdomen, en combinación con el bulbo palpal con quilla prolateral superior, prolateral inferior, subapical y la quilla ventral no homóloga, subparalela con quilla subapical y quillas prolaterales, en la presencia de setas espiniformes en los maxilares ventrales, el número reducido de cúspides labiales, la presencia de setas espiniformes largas retrolaterales en el lóbulo címbico del macho y la espermateca de la hembra consistente en dos receptáculos separados hiperesclerotizados.

Keywords:

Mygalomorphae; South America; taxonomy; *Antikuna*; *Thrixopelma*.

Palabras clave:

Mygalomorphae; América del Sur; taxonomía; *Antikuna*; *Thrixopelma*.

Introduction

Ferretti et al. (2023) described *Chinchaysuyu* (Theraphosidae: Theraphosinae), a new monotypic genus from altitudes about 4,000 a.s.l. in Cajamarca, Peru. The genus was established based on the distinct genitalic morphology, both male and female specimens. Males of *Chinchaysuyu* Ferretti et al., 2023 differ from all known species by having a palpal bulb organ with many conspicuous keels extending toward the subtegulum. Females differ by having two pairs of short and hyper-sclerotized receptacles. According to the phylogenetic analysis carried out by Ferretti et al. (2023), *Chinchaysuyu* was resolved as the sister group of *Antikuna* Kaderka et al., 2021, sharing the presence of short spiniform setae on ventral maxillae, the urticating setae of type III placed in one dorsal patch, the reduced number of labial cuspules and male metatarsi I curved (Ferretti et al., 2023). The relationship of *Haplotremus* as the sister group of *Chinchaysuyu* + *Antikuna* was supported by the presence of the type III urticating setae in one dorsal patch, metatarsi I of males curved, the presence of PS and PI keel in palpal bulb morphology (Ferretti et al., 2023), and their distribution in the Peruvian Andes.

In October 2023, while examining the Theraphosidae spider collection at the Museum of Natural History in Lima, Peru, a single female of *Chinchaysuyu spinosa* Ferretti et al., 2023 from La Encañada district, Cajamarca, Peru, was discovered. This new female specimen is herein described and illustrated, including spermathecae consisting of two seminal receptacles only.

Material and methods

Material for morphological study

Chinchaysuyu spinosa Ferretti et al., 2023, female (MUSM-ENT 0501492) from Peru, Cajamarca, La Encañada, 6°59'27.56"S, 72°19'49.46"W (erroneously recorded coordinates, probably 6°59'27.56"S, 78°19'49.46"W),

3,880 a.s.l., 4–14 September 2010, C. Carranza col. (see the label; Figure 1).

Thrixopelma ockerti Schmidt, 1994, holotype exuvia (SMF 40592), exuvia (SMF 57896, damaged), exuvia (SMF 57974) and microscope slide (SMF 57974) from Peru, locality unknown, Roland Ockert col. and ded., 1992 and 1993; *Thrixopelma ockerti* Schmidt, 1994, female (MUSM-ENT 0511871) from Peru, Loreto, Iquitos, N. Ahuanari col., October 20, 2017; *Thrixopelma pruriens* Schmidt, 1998, female holotype (SMF 39212), 3 males (SMF 39212), exuviae (SMF 57891, SMF 57918, SMF 58011, SMF 58329) and microscope slides (SMF 57949, 58329, 58337) from Chile, locality unknown, B. Scheiring ded., 1995; *Thrixopelma cyaneolum* Schmidt, Friebolin & Friebolin, 2005, syntypes-exuviae (SMF 58100), exuvia (SMF 63559) and microscope slides (SMF 58104, 58105) from Peru; *Thrixopelma lagunas* Schmidt & Rudloff, 2010, male holotype (SMF 66757), three female paratypes (SMF 66758), one female paratype (SMFD 66759) from Peru, Loreto, southly of Lagunas village, right side of riverbank, 5°20'S, 75°42'W, 150 m a.s.l., local collectors, date of collection unknown; *Thrixopelma* sp., male (MUSM-ENT 0500671) from Peru, Lima, Bosque de Zarate, Molle, 2,400 m a.s.l., Irma Francke (VF5-068, December 10, 1977; *Thrixopelma* sp., adult male (MUSM-ENT 0513041) from Peru, Apurímac, Ahuyaro, near bridge across Rio Pampas, 2,006 m a.s.l., 17 October 2018, R. Kaderka col.; *Thrixopelma* sp., male (MUSM-ENT 0513043) from Peru, Apurímac, Ahuyaro, near bridge across Rio Pampas, 2,034 m a.s.l., 17 October 2018, R. Kaderka col.; *Thrixopelma* sp., female (MUSM-ENT) from Peru, Cajamarca, Comunidad La Chorrera, 6,691 m a.s.l., April 2010, C. Torres col.; *Thrixopelma* sp., female (MUSM-ENT) from Peru, Cajamarca, Parque Nacional Cutervo, Puente de Suro, 2,438 m a.s.l., 22 May 2010, R. Pinto-da-Rocha, M. Alvarado, D. Silva D. col.; *Theraphosinae*, male (MUSM-ENT 0503512) from Peru, Cajamarca, Ca. Rio Chonta, San José, 4,066 a.s.l., 20–22 November 2010, Flora Chávez col.

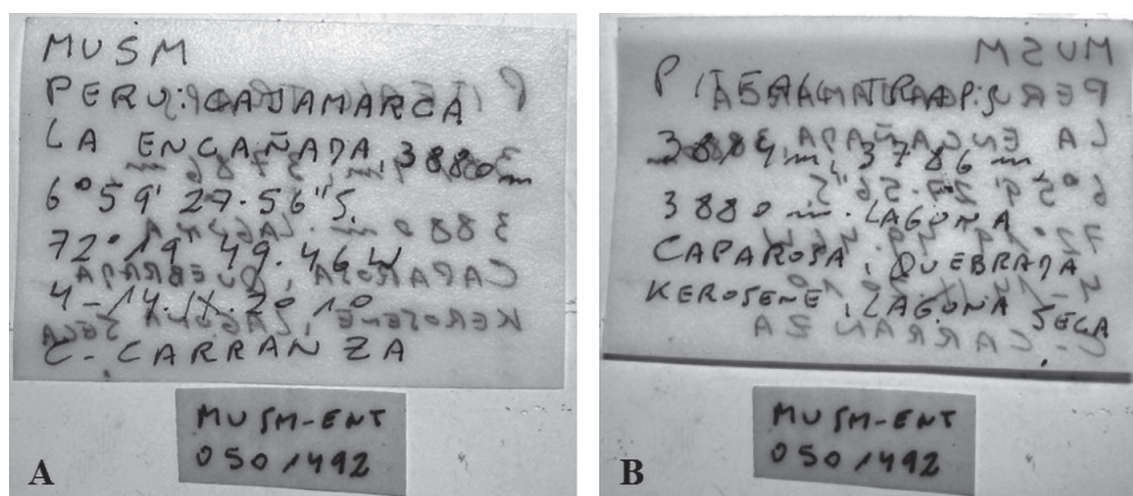


Figure 1. Labels of female of *Chinchaysuyu spinosa* Ferretti et al., 2023 (MUSM-ENT 0501492) from La Encañada, Cajamarca, Peru. Photo: Radan Kaderka.

Methods for morphological study. Material studied are from collections at the Museo de Historia Natural, Lima, Peru (MUSM), and from Senckenberg Forschungsinstitut und NaturMuseum Frankfurt, Frankfurt am Main, Germany (SMF). The GPS coordinates of the collection sites of each specimen are omitted in order to avoid the illegal collection of specimens given that these species are protected by Peruvian law.

All material was examined and measured using a binocular microscope Leica S6D with the magnification range from 6.3x up to 40x and an ocular graticule 10 mm/ 0.1 mm. All measurements were taken according to the central axis of structures and are provided in millimeters. The measurements of the leg and palpal segments were taken in dorsal view. The eye measurements were taken from the widest spans of the lens, AME in dorsal view, ALE, PLE, and PME in dorsolateral view. The measurement of the total body length, excluding chelicerae and spinnerets, was made using a binocular microscope Leica S6D. The extents of tarsal and metatarsal scopulae on the ventral side of both leg segments were expressed as a percentage of the total length of the segment. The leg spination was described using the following method modified from Petrunkevitch (1925) and Bertani (2001): Each leg segment was divided into four quadrants (ventral, prolateral, retrolateral, and dorsal) and each quadrant described separately in basal, central and apical section, e.g., metatarsus I v 1-0-3 means that in the ventral plane (quadrant) there is one spine in basal section and three spines in apical section. If the bases of all three spines in apical section are located apically, then their position is described by the term “apical” in parentheses. Unequal numbers of spines on the right and left side of the same leg segment were expressed by parentheses.

The female spermathecae and male palpal bulbs were separated from the body and preserved in microvials in 70% alcohol together with the specimen. The tissue debris remaining on the spermathecal surface was removed using 1% sodium hydroxide solution.

The terminology of male palpal bulb structures follows Bertani (2000), except for tegular protuberance (TP). At the species level, the differences in genitalia structures are generally considered key for alpha-taxonomy due to their rapid evolutionary divergence.

The abdominal urticating setae were removed from the area of urticating setae with forceps, placed in alcohol and examined using a binocular microscope Olympus BH2-RFCA. The terminology of urticating setae follows Cooke et al. (1972) and Kaderka et al. (2019). Barbs of urticating setae whose tips are oriented towards the seta base are called reversed.

The photographs of preserved material were taken with a Canon G5 mounted directly on the eye-piece of a binocular microscope Leica S6D illuminated by an incorporated LED ringlight. Photographs of live specimens were taken with a Canon G5.

Abbreviations. Eye sizes and interdistances: AME = anterior median eyes, ALE = anterior lateral eyes, PME =

posterior median eyes, PLE = posterior lateral eyes, OQ = ocular quadrangle (including lateral eyes). Spination: p = prolateral, r = retrolateral, d = dorsal, v = ventral. Male palpal bulb: PS = prolateral superior keel, PI = prolateral inferior keel, A = apical keel, SA = subapical keel, R = retrolateral keel, SP = sperm pore, E = embolus, TP = tegular protuberance. Spermathecae: SBE = sclerotized basal extension of seminal receptacles. car. = carapace length. PLS = posterior lateral spinnerets, PMS = posterior median spinnerets. Collections: MUSM = Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru. SMF = Senckenberg Forschungsinstitut und Naturmuseum Frankfurt, Frankfurt am Main, Germany. pers. obs. = personal observation.

Results

Revision of the spermathecal shape in *Chinchaysuyu*. In October 2023, while examining the Theraphosidae spider collection in the Museum of Natural History in Lima, Peru, a single female of *Chinchaysuyu spinosa* Ferretti et al., 2023 from La Encañada district, Cajamarca, was discovered. The female (MUSM-ENT 0501492) shares with the female paratype of *Chinchaysuyu spinosa* (MUBI 134) the presence of type III urticating setae placed dorsally in one abdominal patch, similar shape of ventral maxilla, the presence of short spiniform setae in apical half of ventral maxilla, the reduced number of labial cuspules (less than 20), similar extension of metatarsal scopulae, and also the distribution area (Figure 4). This new female specimen of *Chinchaysuyu spinosa* (MUSM-ENT 0501492) is herein described and illustrated. Both females of *Chinchaysuyu spinosa* differ in the number of spheroidal receptacles. As the seminal receptacles in females are a paired organ symmetrical along the longitudinal axis of the body, two pairs of asymmetrically arranged seminal receptacles in the female paratype of *Chinchaysuyu spinosa* are considered an anomaly described, e.g., in Lucas, Brescovit & Paula (2009), Gabriel (2011) and Gabriel & Sherwood (2020).

The first described case of spermathecal malformation concerns *Nhandu tripartitus* Schmidt, 1997. Schmidt (1997) described *N. tripartitus* from Southern Brazil and/or Paraguay or Uruguay based on two female exuviae with identical trilobed spermatheca, considered the main diagnostic feature. This character has not been found in other theraphosid species and according to Bertani (2001), it seems to be just a structural genitalic anomaly. Although rare, duplication of female external genitalia, where the two organs are side by side, were reported for other spiders, such as *Lycosa carolinensis* Walckenaer, 1805 and *Pardosa sagei* Gertsch & Wallace, 1937 (Muma, 1943 and Kaston, 1963 in Bertani, 2001). The lack of information regarding structural abnormalities in Theraphosidae seems to be due to the lack of reporting them, not the lack of the abnormalities themselves (Bertani, 2001). Gabriel (2011) reexamined the female holotype of *Nhandu tripartitus*. As the spermathecal morphology has been regarded as a genetic anomaly, the species was synonymized with *Nhandu carapoensis* Lucas, 1983 (Gabriel, 2011). A genetic defect in the fema-

le from which both type exuviae of *N. tripartitus* originate, could explain the existence of trilobed spermathecae in both of them.

Lucas et al. (2009) showed the malformations of spermathecae in *Acanthoscurria suina* Pocock, 1903, and further examples of partially conjoined spermathecae in *Grammostola rosea* (Walckenaer 1837) and *Acanthoscurria sternalis* Pocock 1903 are figured in Gabriel (2011), and also in the recently published article by Gabriel & Sherwood (2020), in which the authors show the malformations in the unipartite spermathecae of *Davus ruficeps* (Simon, 1891) and *Hapalopus* sp. from Colombia.

A common feature of all these malformations in spermathecae is that the seminal receptacles are unequally sized, at least some of them less developed, conjoined in an unusual manner, and especially not symmetrical along the longitudinal body axis. All these cases open the question of the origin of such malformations and their ontogeny.

The spermathecal shape of the female paratype of *Chinchaysuyu spinosa* is another example of such malformation. The hyper-sclerotized spheroid seminal receptacles are of unequal size and asymmetrically arranged in the irregular transverse row.

Description of female (MUSM-ENT 0501492, Figures 2–4, Table 1). Total length: 30.0, carapace length 13.6, width 12.5 (Figure 2A), chelicerae with 12–13 teeth on promargin. Cheliceral denticulation from basal end: right side: v-V-VvV-VVVVVV, 10 big and 2 small teeth. Left side: V-V-VV-V-VVVVVVV, 13 big teeth. Anterior eye row slightly procurved, posterior eye row recurved. Eye sizes and interdistances (Figure 2C): AME 0.41 (circular), ALE 0.43 (oval), PME 0.36 (oval), PLE 0.43 (oval), AME-AME 0.36, AME-ALE 0.22, PME-PME 0.91, PME-PL 0.14, ALE-PL 0.35, AME-PME 0.16, OQ length 1.11, width 2.04. Ocular tubercle: length 1.69, width 2.04, clypeus absent. Fovea transverse, straight, deep, width 2.2. Labium length 2.1, width 3.0, anterior half with 15 cuspules, maxillae with 160–164 cuspules in basal half and short spiniform setae in apical half (Figure 2D). Sternum domed (Figure 2B), length 7.02, width 6.47, with three visible pairs of sternal sigilla located near coxae III (length 0.73, 0.86 from edge of sternum), coxae II (length 0.36, 0.40 from edge of sternum) and coxae I (length 0.27, 0.39 from edge of sternum). Coxae I prolaterally with longitudinal stripe of spiniform setae near ventral side. Leg formula: IV>I>II>III. All leg segments uniform.

Scopulae: All tarsi 100% densely scopulate, metatarsi I 95%, metatarsi II 80%, metatarsi III 50%, metatarsi IV 25% scopulate. Tarsal scopulae I integral, tarsal scopulae II divided by a longitudinal band of setae, in tarsi III and IV divided by a wide band of setae. Metatarsal scopulae III and IV divided by a band of setae. Dorsal face of all tarsi and cymbium with two irregular longitudinal rows of very short claviform trichobothria. Denticulation of paired tarsal claws on right legs (prolateral / retrolateral row): I 3/3, II 3/4, III 4/4, IV 5/3. Plumose setae on retrolateral face of femur IV absent. Retrolateral side of

femur IV with longitudinal stripe without covering setae.

Spination: femora I p 0-0-1, II p 0-0-1, III d 0-0-1 and IV p 0-0-1, r 0-0-1 and femora of palps p 0-0-1, patellae I 0, II p 0-1-0, III o 0-0-1, IV p 0-1-0, r 0-1-0 and patellae of palps 0, tibiae I v 0-1-3 (apical), II v 1-1-3 (apical), p 1-1-0, III v 1-2-3 (apical), p 1-0-0, r 1-1-0, IV v 1-2-2 (apical), p 1-1-0, r 1-1-1 and tibiae of palps v 0-0-3 (apical), metatarsi I v 0-0-1 (apical), II v 2-0-3 (apical), p 0-1-0, III v 4-2-4 (apical), p 1-1-1, r 1-1-1, IV v 2-2-2-3 (apical), p 1-1-1, r 1-1-1-1, tarsi I–IV and tarsi of palps 0.

Spermathecae (Figure 3): two separated spheroidal seminal receptacles.

Abdomen: urticating setae of type III are located in an almost circular central patch. PLS: length 5.80, basal segment 2.16, middle segment 1.61, apical segment 2.03, all digitiform. PMS: 1.51.

Coloration and covering setae: dorsal view (Figure 2A): carapace reddish brown, caput darker than the rest of carapace, coxae with pale pubescence, chelicerae brown, femora black with blue iridescent, patellae, tibiae, metatarsi and tarsi dark brown, intermixed with long, pale setae. Patellae I, II, and palpal patella with two almost equal parallel longitudinal stripes without covering setae, patellae III, IV with two unequal diagonal stripes. Femora and tibiae dorsally with two parallel stripes of thin pubescence. Retrolateral side of all femora with one longitudinal stripe without covering setae. Palpal femur prolaterally bare. Abdomen (Figure 2E) dorsally black, intermixed with long, pale setae, and with anterior pair of small spots without covering setae. Length of central patch: 6.7, width 7.2. Ventral view (Figure 2B): maxillae, labium, sternum, coxae, trochantera reddish-brown, femora, patellae, tibiae, and metatarsi dark brown. Abdomen ventrally black (Figure 2F), except for dark brown posterior booklung and median pair of spots without covering setae. Spinnerets dark brown.

Revision of homologous keels in *Chinchaysuyu*.

Ferretti et al., 2023 found three homologous keels in the palpal bulbs of *Chinchaysuyu spinosa*: PS, PI, and R keel. The PI keel and the PS keel were inferred by their parallel position along the prolateral area and being the closer keels to the embolus. The R keel was identified at the retrolateral face of the short embolus (Ferretti et al., 2023). In addition, they proposed new names for non-homologous keels: „prolateral accessory inferior keel“ (PAIK) for a well-developed prolateral accessory inferior keel (Figure 5A), „prolateral accessory central keel“ (PACK) for a central keel among PS and PI keel, and „prolateral accessory keels“ (PAKs) for many less developed prolateral keels.

The palpal bulb structures in *Chinchaysuyu spinosa* Ferretti et al., 2023 were revised and new homologies for the bulb keels are proposed (Figure 5B). They were derived from those found in the males of *Antikuna*, the sister genus to *Chinchaysuyu* according to Ferretti et al. (2023), and the males of morphologically and geographically similar genus *Thrixopelma* Schmidt, 1994 (see Material examined). *Chinchaysuyu*, *Thrixopelma* and an

Table 1: *Chinchaysuyu spinosa* Ferretti et al., 2023, female (MUSM-ENT 0501492) from La Encañada, Cajamarca, Peru. Lengths of palpal and leg segments:

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	6.6	4.3	4.6	–	5.1	20.6
Leg I	9.6	5.8	6.6	5.1	4.6	31.7
Leg II	8.3	5.2	5.5	4.9	4.3	28.2
Leg III	7.6	4.9	4.8	5.7	4.5	27.5
Leg IV	9.8	5.4	6.6	8.5	5.3	35.6

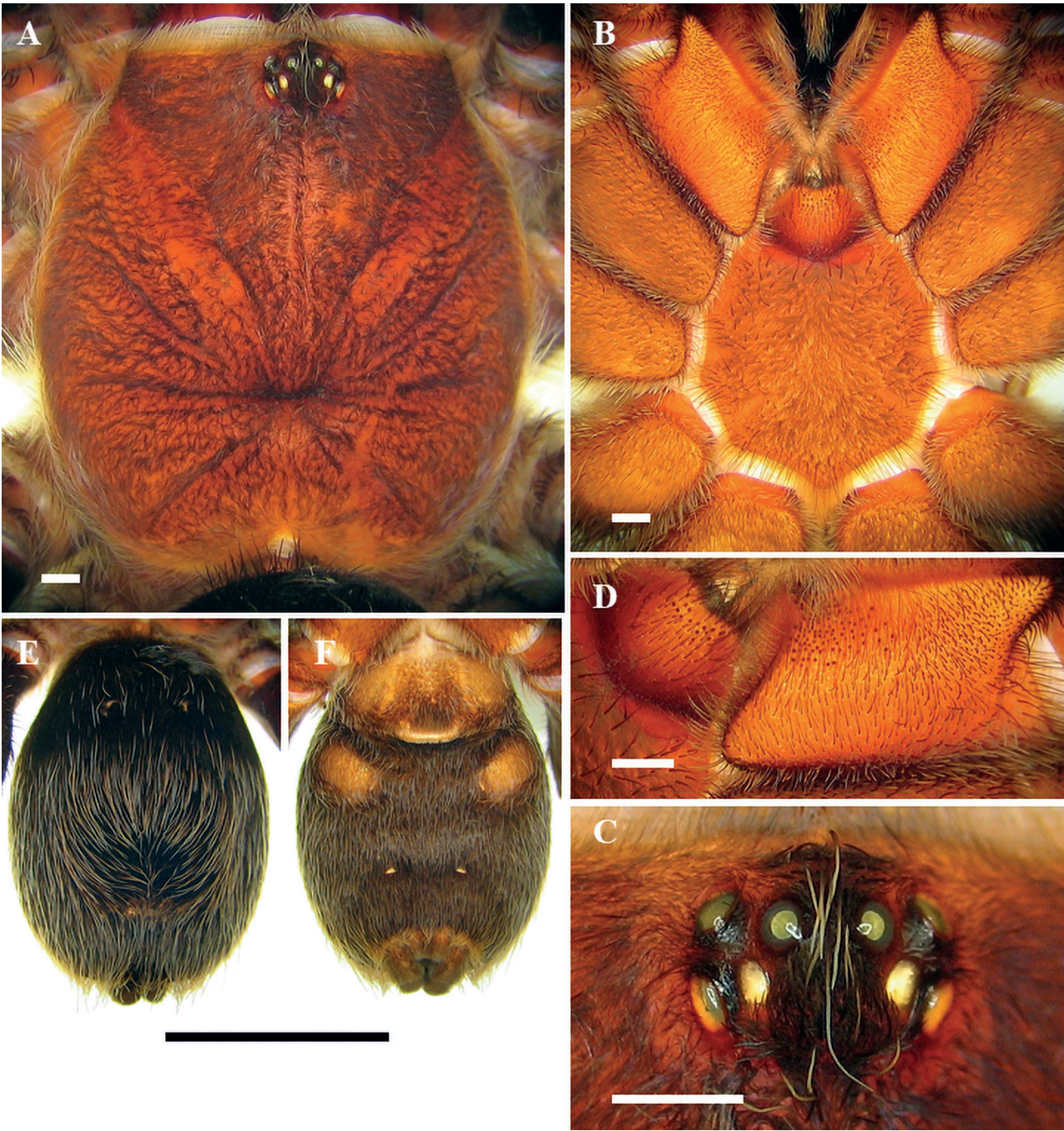


Figure 2. *Chinchaysuyu spinosa* Ferretti et al., 2023, female (MUSM-ENT 0501492) from Peru, Cajamarca, La Encañada, 3,880 m a.s.l. **A.** Carapace, dorsal view. **B.** Sternum, labium, maxillae and coxae, ventral view. **C.** Ocular tubercle, dorsal view. **D.** Labium and left maxilla, ventral view. **E.** Abdomen, dorsal view. **F.** Abdomen, ventral view. Scale bar = 1 mm (Figures A–D). Scale bar = 10 mm (Figures E–F). Photo: Radan Kaderka.

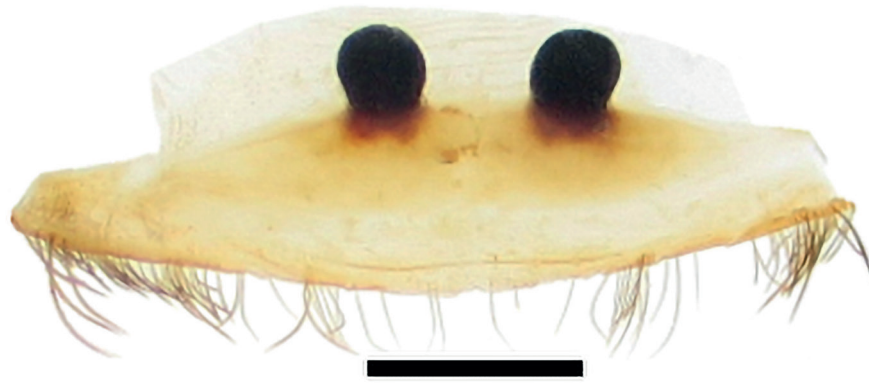


Figure 3. *Chinchaysuyu spinosa* Ferretti et al., 2023, adult female (MUSM-ENT 0501492) from Peru, Cajamarca, La Encañada. Spermathecae with two spheroidal seminal receptacles, ventral view, dissected from specimen in alcohol. Scale bar = 1 mm. Photo: Radan Kaderka.

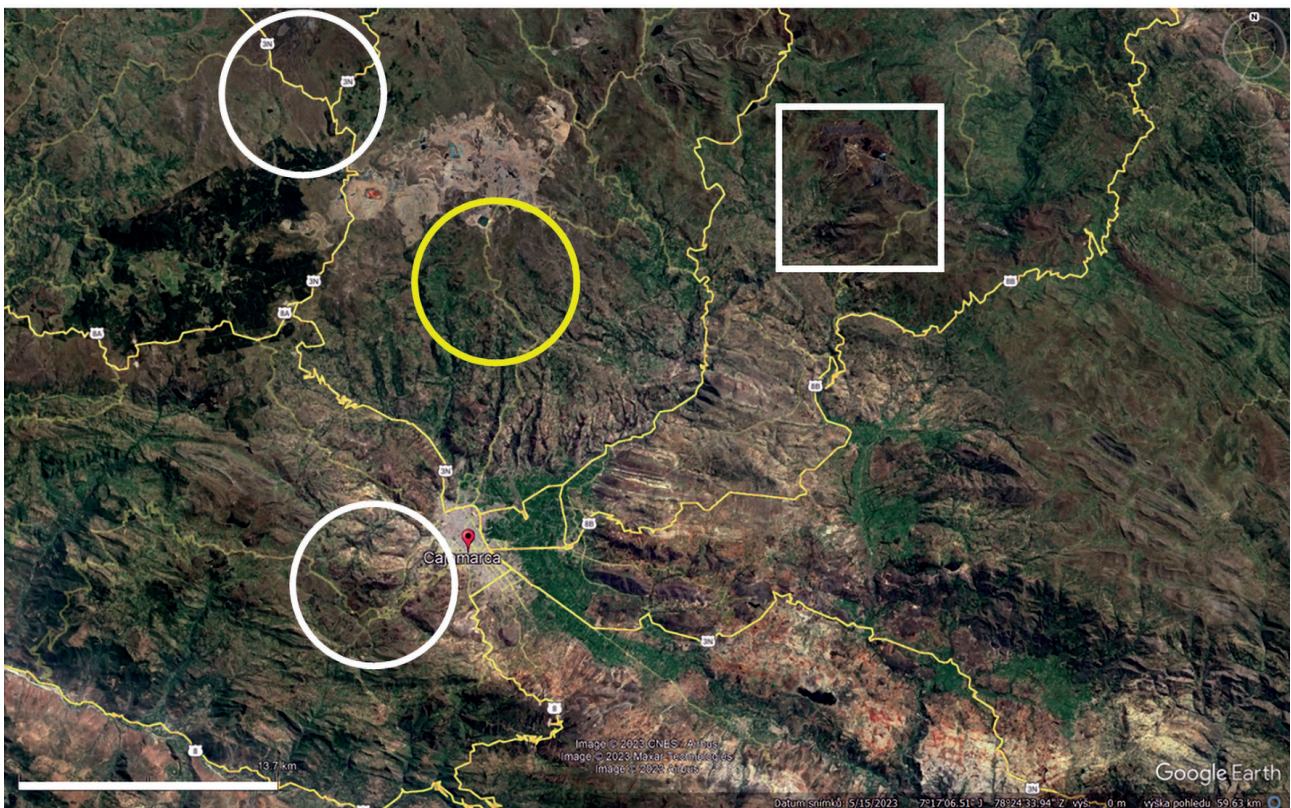


Figure 4. Distribution map of *Chinchaysuyu spinosa* Ferretti et al., 2023 from Cajamarca, Peru, including the new population from the district La Encañada. Legend: Yellow circle = *Chinchaysuyu spinosa*, male holotype (MUBI 60), female paratype (MUBI 134), and male paratype (MUBI 135); white circle = *Chinchaysuyu spinosa*, non-type males (MUBI 66, MUBI 67); white square = female (MUSM-ENT 0501492) from the district La Encañada. Red pin = the city of Cajamarca. Scale bar: 13.7 km. Prepared by R. Kaderka.

undescribed male (MUSM-ENT 0503512; Figure 6) have most keels in the palpal bulb, in addition to the R keel. In all these taxa the PI keel is well-developed and in the parallel position with the less developed PS keel. The SA keel is short, distally ending in subtriangular tooth (Figure 5, 6; Kaderka et al., 2021; pers. obs.). The A keel is present in all these taxa, except for *Chinchaysuyu*. If the PI and A keel are present, the sperm pore is always loca-

ted between these keels. It means that the sperm pore is never located between subparallel prolateral keels, PS and PI keel. The prolateral accessory inferior keel (PAIK sensu Ferretti et al., 2023) was renamed the ventral keel (V) because of its position on the bulb. It is a non-homologous accessory keel which is parallel with SA, PI and PS keel in *Chinchaysuyu*.

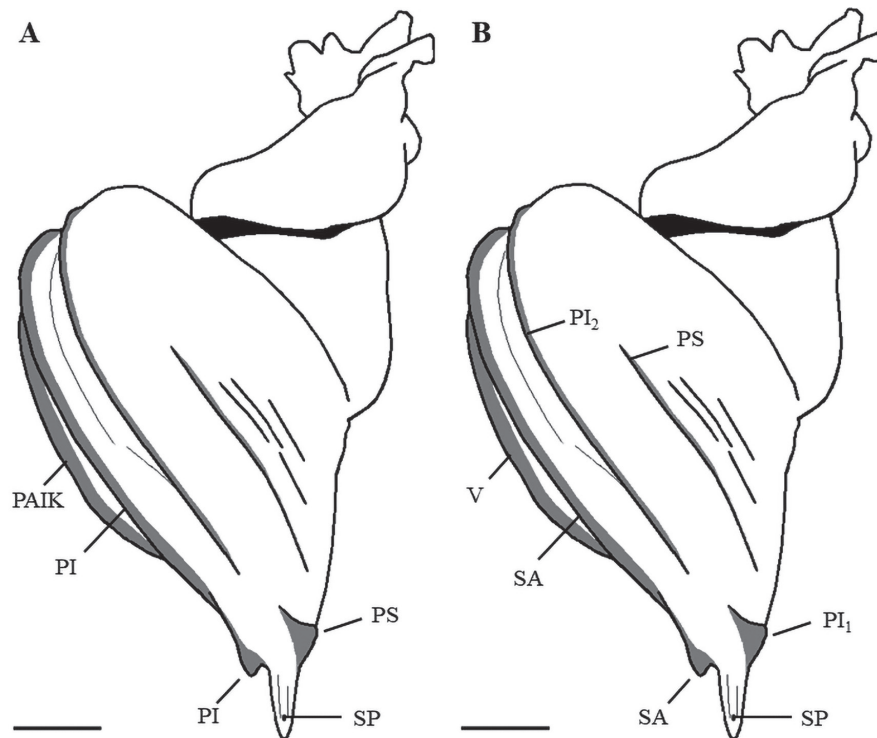


Figure 5. *Chinchaysuyu spinosa* Ferretti et al., 2023, male holotype (MUBI 60), morphology of palpal bulb. **A.** Original naming of homologous and non-homologous keels. **B.** Proposed naming of homologous and non-homologous keels. Scale bar = 200 micrometers. Abbreviations: PS = prolateral superior keel; PI = prolateral inferior keel; SA = subapical keel; SP = sperm pore which is placed between PI and A keel in the majority of Theraphosinae; PAIK = prolateral accessory inferior keel; V = ventral keel. Drawing by R. Kaderka (modified from Ferretti et al., 2023).

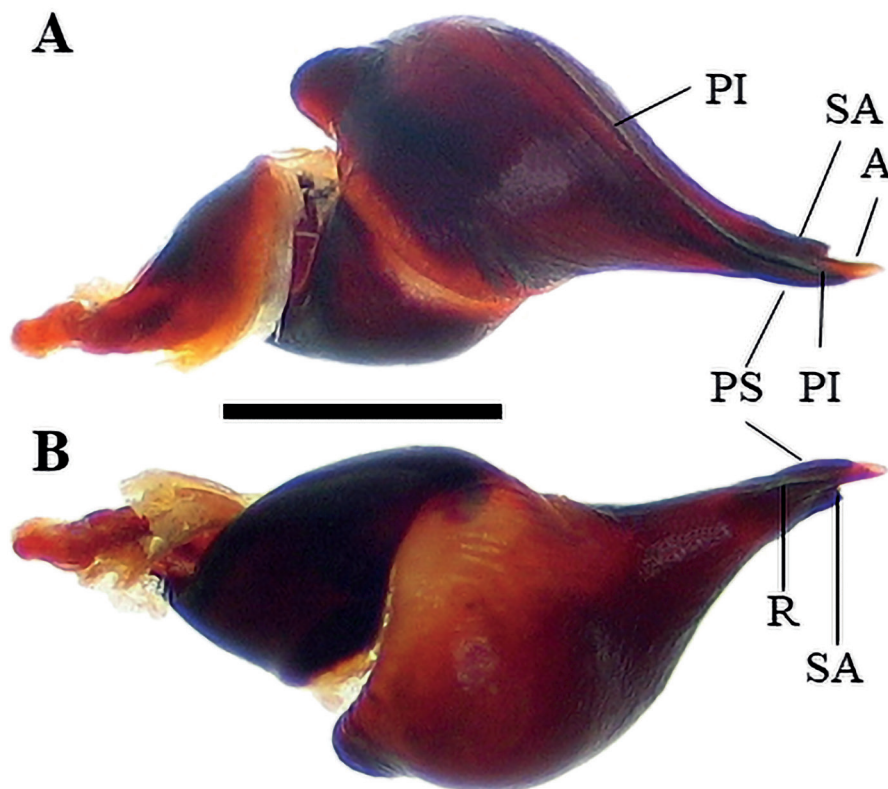


Figure 6. Theraphosinae, male (MUSM-ENT 0503512) from Peru, Cajamarca, Ca. Rio Chonta, San José, 4,066 m a.s.l., morphology of right palpal bulb. **A.** Prolateral view. **B.** Retrolateral view. Scale bar = 1 mm. Photo: Radan Kaderka.

Discussion on the possible phylogenetic relationship of the genera *Chinchaysuyu* and *Thrixopelma*.

According to the phylogenetic analysis carried out by Ferretti et al. (2023) based on the morphological characters, *Chinchaysuyu* is a sister genus to *Antikuna* Kaderka et al., 2021, sharing the presence of short spiniform setae on ventral maxillae (Ferretti et al., 2023), the presence of type III urticating setae, the similar morphology of male palpal bulbs carrying more than two prolateral keels, and, here proposed, the presence of two separate seminal receptacles in females.

According to Ferretti et al. (2023) *Chinchaysuyu* resembles *Thrixopelma* Schmidt, 1994 in the short receptacula of female spermatheca (Ferretti et al., 2023) and the similar morphology of the male palpal bulb having PS, PI, A, SA and R keel, but *Chinchaysuyu* differs in the maxillae ventrally bearing spiniform setae, the absence of subconical tegular apophysis in male palpal bulb (Ferretti et al., 2023), the reduced number of labial cuspules, the absence of A keel in the male palpal bulb morphology, and the absence of type IV urticating setae.

The absence of retrolateral process on palpal tibia and the cluster of short spiniform setae in this area are not appropriate characters to distinguish both genera because they are also absent in some *Thrixopelma* species (pers. obs.).

Today, the majority of evolutionary hypotheses are inferred from molecular sequence data. The main reason is that the evolutionary relationships are not burdened by possible homoplasies consisting in the erroneous evaluation of morphological characters subsequently resulting in erroneous phylogenetic hypotheses. The molecular analysis involving *Chinchaysuyu spinosa*, *Thrixopelma* and another Theraphosinae specimens from species-rich department of Cajamarca in Peru should strengthen the position of *Chinchaysuyu* and help to understand the phylogenetic relationships within Theraphosinae living in this region.

Taxonomy

INFRAORDER MYGALOMORPHAE Pocock, 1892

FAMILY THERAPHOSIDAE Thorell, 1870

SUBFAMILY THERAPHOSINAE Thorell, 1870

GENUS *CHINCHAYSUYU* Ferretti et al., 2023

***Chinchaysuyu spinosa* Ferretti et al., 2023**

Type species. Male holotype (MUBI 60) from Peru, Cajamarca department, San José, 22 February 2022, J.C. Chaparro col.; female paratype (MUBI 134) from Peru, Cajamarca department, San José, 22 February 2022, J.C. Chaparro col.; male paratype (MUBI 135) from Peru, Cajamarca department, San José, 30 July 2022, J.C. Chaparro col.

Remarks. *Chinchaysuyu spinosa* is also known from the non-type material: male (MUBI 66) from Peru, Cajamarca department, Cumbemayo, 19 February 2022,

3,730 m a.s.l., J.C. Chaparro col.; male (MUBI 67) from Peru, Cajamarca department, Lagunas, 19 February 2012, 3,935 m a.s.l., J.C. Chaparro col. (examined by Ferretti et al., 2023); female (MUSM-ENT 0501492) from Peru, Cajamarca, La Encañada, 3,880 a.s.l., 4–14 September 2010, C. Carranza col. (examined)

Diagnosis (modified from Ferretti et al., 2023).

Chinchaysuyu differs from all known genera by the presence of type III urticating setae placed in one dorsal patch on abdomen, in combination with the palpal bulb with PS, PI, SA keel and the non-homologous ventral keel, subparallel with SA, PI and PS keel (Figure 5B), the presence of spiniform setae on ventral maxillae, the reduced number of labial cuspules, the presence of long spiniform setae on male retrolateral male cymbial lobe (Ferretti et al., 2023: figures 2C, 2E and F), and the female spermathecae consisting of two separate hypersclerotized receptacles (Figure 3).

Affinities (modified from Ferretti et al., 2023).

Chinchaysuyu belongs to the group of geographically related genera inhabiting the Andean region: *Anqasha* Sherwood & Gabriel, 2022, *Antikuna* Kaderka et al., 2021, *Bistriopelma* Kaderka, 2015, *Cyriocosmus* Simon, 1903, *Haplotremus* Simon, 1903, *Thrixopelma* Schmidt, 1994 and *Urupelma* Kaderka et al., 2023 in having abdominal urticating setae of the type III or III+IV.

Chinchaysuyu differs from *Anqasha* in the different morphology of male and female genitalia (see Sherwood & Gabriel, 2022: 2-5, 15-21; Kaderka, 2023: figures 2, 6, 9).

Chinchaysuyu differs from *Antikuna* in the different morphology of male and female genitalia and the presence of long spiniform setae retrolateral on male cymbial lobe.

Chinchaysuyu differs from *Bistriopelma* in the presence of only one patch of urticating setae (two lateral patches in *Bistriopelma*) and the shape of female spermathecal receptacles (two short hypersclerotized receptacles without apical extension in *Chinchaysuyu* and two long and flattened receptacles with apical extension in *Bistriopelma*);

Chinchaysuyu differs from *Cyriocosmus* in the different morphology of male and female genitalia (the absence of spiral neck in female seminal receptacles and the presence of more than two keels in male palpal bulb morphology in *Chinchaysuyu*).

Chinchaysuyu differs from *Haplotremus* in the different morphology of male and female genitalia (two pairs of seminal receptacles in females of *Chinchaysuyu*, unipartite spermatheca in *Haplotremus*);

Chinchaysuyu differs from *Thrixopelma* in the morphology of male palpal bulb not having the subconical tegular apophysis (present in *Thrixopelma*), in the maxillae bearing ventrally spiniform setae on distal half, the reduced number of labial cuspules, the absence of A keel in male palpal bulb morphology, and in the absence of type IV urticating setae.

Chinchaysuyu differs from *Urupelma* in strongly sclerotized and hypersclerotized seminal receptacles (flat and weakly sclerotized seminal receptacles with subbasal constriction in *Urupelma*). In *Chinchaysuyu* the PI keel is less developed on embolus but extended to tegulum (in *Urupelma* PI keel is more developed on embolus and absent or weakly developed on tegulum; weakly developed only in *U. awanqay* Kaderka et al., 2023).

Remarks. As Ferretti et al. (2023) noticed, *Chinchaysuyu* shares with *Antikuna*, another Peruvian high-elevation theraphosid genus (Hapalopini), the presence of spiniform setae on the ventral face of maxillae, both in male and female (Ferretti et al., 2023). This feature is also shared by another high Andean genus *Bistriopelma* Kaderka, 2015 (Grammostolini). It means that this character evolved independently in both tribes of Theraphosinae, presumably to give the chelicerae a more stable grip on their prey.

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