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Description of a new species of *Chaco* Tullgren, 1905 (Araneae: Mygalomorphae: Pycnothelidae) from Argentina and the southernmost record of the genus

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Abstract: A new species of *Chaco* Tullgren, 1905 was discovered and is formally described. *Chaco aoni* sp. nov. from the Santa Cruz River in Santa Cruz Province, Argentina, is the southernmost recorded species of this genus. The new species is diagnosed on the basis of the morphology of the palpal organ and tibial apophysis of males and the shape of the spermathecae of females. A cladistic analysis was carried out based on an already published morphological matrix, which now also includes the new species. This new species is part of a monophyletic group including also *Chaco tingua* Indicatti, Folly-Ramos, Vargas, Lucas & Brescovit, 2015*, C. tecka* Goloboff, 1995*, C. sanjuanina* Goloboff, 1995*, C. patagonica* Goloboff, 1995 and *C. ansilta* Ferretti, 2014.

Keywords: Taxonomy - spiders - systematics - Patagonia.

INTRODUCTION

The spider family Pycnothelidae Chamberlin, 1917 comprises 139 species described in 15 genera (World Spider Catalog, 2024) of very small to medium-sized mygalomorph spiders. The genus *Chaco* is included in the subfamily Diplothelopsinae Schiapelli & Gerschman, 1967 which can be recognized by the following combination of characters: (i) male leg tarsi flexible; (ii) female scopulae on legs I and II symmetric; (iii) inferior (unpaired) tarsal claw present or absent on tarsi IV (Montes de Oca *et al*., 2022). *Chaco* was established by Tullgren (1905), based on a female from Jujuy, Argentina, described as the holotype of the type species, i.e. *C. obscura* Tullgren, 1905. The male of *C. obscura* was later described for the first time by Goloboff (1995). Ninety years after the description of the first species, Goloboff (1995) added an exhaustive contribution to our knowledge of the South American pycnothelids. Later, Montes de Oca & Pérez-Miles (2013) discovered two new species from Uruguay and extended the known distribution of the genus to that country. Then *C. ansilta* Ferretti, 2014 was described from western-central Argentina. The latest species described in this genus was *C. tingua* Indicatti, Folly-Ramos, Vargas, Lucas & Brescovit, 2015 from Rio de Janeiro, Brazil; it is known from both sexes (Indicatti *et al*., 2015).

The first cladistic analysis for this genus was published by Goloboff (1995), who found a close relationship between representatives of the tribe Diplothelopsini, such as the genus *Lycinus*. Then Montes de Oca & Pérez-Miles (2013) and Ferretti (2014) carried out new cladistics analyses that included new species they described. In the latter publication the genus was recovered as monophyletic, and monophyly of the group (*C. tecka* (*C. sanjuanina* (*C. patagonia* (*C. ansilta*)))) was established based on the synapomorphy of scopula on tarsus IV being absent or very light.

Thus, the genus *Chaco* hitherto contained 11 species distributed in Argentina, Brazil, Chile and Uruguay (World Spider Catalog, 2024). Little is known about their biology; apparently, most species of the genus live in

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burrows closed with a trapdoor (Goloboff, 1995; Indicatti *et al.,* 2015; Allegue *et al*., 2023).

Representatives of this genus can be recognized by the following combination of characters: four short spinnerets; eight eyes grouped on a low tubercle; tarsi of legs I-II scopulate, without spines or claw tufts, superior (paired) tarsal claws with numerous teeth in two rows; tibia I of males with a retrolateral-distal megaspine or with a retrolateral-distal apophysis carrying between 2-10 apical spines; patella III of males with 1-1-1 spines and distal portion of tibiae I-II without a scopula; females without pumpkiniform spigots on spinnerets and without a scopula on tibiae of legs I-II (Goloboff, 1995).

In this study we describe and illustrate a new species, *Chaco aoni* sp. nov., from the banks of the Rio Santa Cruz in Santa Cruz Province, Argentina. In addition, we present a distribution map of the species known from Argentina, as well as a cladistic analysis of the genus which includes the newly described species.

MATERIAL AND METHODS

Morphology

The material examined in the present study is deposited in the arachnological collection of Instituto Argentino de Investigaciones de Zonas Áridas (CAI-IADIZA; curator: Gabriel Pompozzi). The terminology for general morphological features follows Goloboff (1995), Ferretti (2014) and Indicatti *et al.* (2015). Spine notation follows Petrunkevitch (1925). Photographs were taken with an MShot digital camera mounted on a Leica S APO stereomicroscope. Photographs taken at different focal planes were stacked using the software Helicon Focus 7. All measurements are given in millimeters and were obtained by analyzing photographs with the software TPSdig2. The distribution map was made using the software QGis (www.qgis.org). The file of the map containing the provincial boundaries of Argentina was downloaded from DIVA-GIS (www.diva-gis.org). We used a Jeol 35 Cf scanning electron microscope (SEM) for examining and photographing palpal organ, tibial apophysis, spinnerets and tarsal claws of the male holotype.

Abbreviations: ALE - anterior lateral eyes, AME - anterior median eyes, D - dorsal, OQ - outer ocular quadrangle, P - prolateral, PLE - posterior lateral eyes, PLS - posterior lateral spinnerets, PME - posterior median eyes, PMS - posterior median spinnerets, R - retrolateral, V - ventral.

Cladistic analysis

Chaco aoni sp. nov. was scored for 32 characters compiled from publications by Goloboff (1995), Montes de Oca & Pérez-Miles (2013) and Ferretti (2014). Characters 1-27 were obtained from the original matrix of Goloboff (1995), and characters 28-32 from the matrix of Montes de Oca & Pérez-Miles (2013). A new matrix (Table 1) was then made with Mesquite 3.7. The outgroups included *Chilelopsis calderoni* Goloboff, 1995; *Lycinus bonariensis* (Mello-Leitão, 1938) and *Lycinus longipes* Thorell, 1894. The ingroup included the following terminals: *Chaco ansilta*, *C. castanea*, *C. costai*, *C. obscura*, *C. patagonica*, *C. sanjuanina*, *C. socos*, *C. tecka*, *C. tigre*, *C. tucumana* and *C. aoni* sp. nov. The tree was rooted using *Lycinus longipes*, and the matrix was analyzed under parsimony with TNT version 1.5 (Goloboff & Catalano, 2016). Tree searches were conducted using implicit enumeration and implied weighting (Goloboff, 1993) to decide on appropriate k-values, following the proposal by Mirande (2009). This approach divides the values of fit/distortion into regular intervals, obtained under different k-values. To achieve this, we used the script aaa.run (Mirande, 2009) implemented in TNT under the commands 3 10 70 95 7. Character optimization and tree editing were performed with the computer software Winclada-ASADO 1.61 (Nixon, 2004). Nodes without support were collapsed and only best trees were kept.

Characters used in the cladistic analysis: (1) Clypeus: 0, wide; 1, narrow. (2) Posterior eye row: 0, recurved; 1, procurved. (3) Eyes: 0, AME and PME almost of same size; 1, AME much larger than PME. (4) Pubescence: 0, absent; 1, light; 2, dense. (5) Sternum: 0, wide; 1, normal; 2, narrow. (6) Sternal sigilla: 0, conspicuous; 1, inconspicuous. (7) Leg color: 0, uniform; 1, forming a pattern. (8) Cover of setae on female posterior legs: 0, normal; 1, dense. (9) Maxillary cuspules in females: 0, few (0-10); 1, several (11-30); 2, many (over 30). (10) Maxillary cuspules in males: 0, few (0-10); 1, several (11-30); 2, many (more than 30). (11) Rastellum of females: 0, weak; 1, strong. (12) Female leg tarsi: 0, rigid; 1, flexible. (13) Scopula on tarsus IV: 0, absent/very light; 1, light; 2, dense. (14) Trichobothria on male cymbium: 0, in central region; 1, in basal half. (15) Spigots on PMS: 0, many; 1, few. (16) Spines on male metatarsus IV: 0, 1-1-1P SUP; 1, 0-0-1P SUP; 2, more than 6 spines (new character state). (17) Dorsal spines on male palpal tibia: 0, absent; 1, present. (18) Spines on male patellae I-II: 0, 0/1P; 1, 1-1-1P. (19) Spines on female patella IV: 0, 0/1P; 1, 1-1-1P. (20) Spines on female tarsus IV: 0, absent; 1, present. (21) Spines on female tibia/metatarsus I: 0, short; 1, long. (22) Male tibia I apophysis: 0, absent; 1, present. (23) Male palpal tibia: 0, short; 1, long. (24) Keels on palpal organ: 0, absent; 1, several parallel keels or ridges around embolus base; 2, few lateral keels or flanges. (25) Male sperm duct inside palpal organ: 0, basal portion evenly curved; 1, basal portion strongly sinuous. (26) Spermathecae: 0, no dome (i.e. no dome-shaped lateral parts of the genital atrium); 1, with domes. (27) Burrow entrance closed by: 0, flap-door (a one-sided extension of the burrow lining that projects beyond the opposite side of the burrow entrance and can be folded backwards to

Table 1. Morphological data matrix for cladistics analysis of the genus *Chaco*.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
Chilelopsis calderoni	0	1	0	1	1	0	0	1	2	2	0	0	1	0	0	1	0	1	0	0	0	0	0	2	1	0	0	1	0	0	0	?
Lycinus bonariensis	0	1	1	2	0	0	0	0	0	0	0	1	2	1	?	1	0	1	1	0	0	0	1	0	0	0	0	?	0	0	0	?
Lycinus longipes	0	1	1	2	0	0	0	0	0	0	0	0	2	1	0	1	1	1	1	0	0	0	1	1	0	0	0	0	0	1	0	?
Chaco ansilta	0	0	1	0	1	1	0	1	0	0	1	0	0	0	1	0	0	0	0	1	1	1	0	1	0	1	?	0	0	0	0	0
***Chaco aoni* sp. nov.**	0	0	1	1	1	1	0	0	1	1	1	0	0	0	?	2	1	1	0	0	?	1	1	1	1	0	?	1	0	0	0	0
Chaco castanea	0	0	0	1	1	1	0	0	2	1	1	1	1	0	1	0	0	0	0	0	0	1	1	1	1	0	?	1	0	0	0	0
Chaco costai	0	0	0	1	1	0	0	0	2	2	1	0	1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1
Chaco obscura	0	0	0	1	1	0	1	0	1	1	1	1	1	0	0	1	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1
Chaco patagonica	0	0	0	0	1	1	0	1	0	?	1	0	0	?	1	1	?	?	0	1	1	?	?	?	?	1	0	0	0	?	?	?
Chaco sanjuanina	0	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	0	0	1	1	1	0	1	0	1	?	0	0	0	0	0
Chaco socos	1	0	0	1	1	0	1	0	2	2	1	0	1	0	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0
Chaco tecka	0	0	1	1	1	1	1	1	1	?	1	0	0	?	1	1	?	?	0	0	1	1	?	?	?	1	0	1	0	?	?	?
Chaco tigre	1	0	0	1	1	0	1	0	1	1	1	0	1	0	1	1	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0
Chaco tingua	-	0	1	0	1	1	0	0	1	1	1	0	0	?	1	-	1	0	0	0	?	0	0	1	1	0	1	0	1	0	0	-
Chaco tucumana	0	0	0	1	1	0	1	0	2	1	1	1	1	0	0	1	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1

close the entrance, i.e. a door without a true hinge); 1, trap-door (a more or less thick door with a true hinge). (28) Spermathecal (= receptacular) head: 0, more or less spherical; 1, reniform. (29) Female tibiae: 0, normal; 1, short. (30) Setae on male cymbium: 0, thin and hair-like; 1, thickened and spine-like. (31) Two long dorsal setae on palpal tibia: 0, absent; 1, present. (32) Spines on male tibia I apophysis: 0, five or less; 1, more than five.

RESULTS

Cladistics

The results of the analyses are shown in Table 2. Search with implied weighting (IW) resulted in two equally parsimonious trees under k-values ranging from 2.149 to 4.795, and one equally parsimonious tree was found for k-values between 5.986 and 17.5 with 73 steps. The trees in Fig. 1 are the two most consistent topologies under the k-value = 10.921 (CI = 52, RI = 64). The genus *Chaco*, including the new species, was recovered as monophyletic. This is supported by the following synapomorphies: posterior eye row recurved, rastellum of females strong, 0/1 prolateral spines on patellae of legs I-II of male, tibial apophysis present on leg I of males.

Taxonomy

Family Pycnothelidae Chamberlin, 1917
Subfamily Diplothelopsinae Schiapelli & Gerschman, 1967
Genus *Chaco* Tullgren, 1905

Chaco Tullgren, 1905: 7, type species *Chaco obscura* Tullgren, 1905. – Gerschman & Schiapelli, 1965: 377 (transfer from Barychelidae to Ctenizidae). – Raven, 1985: 103 (transfer from Ctenizidae to Nemesiidae). – Montes de Oca *et al*., 2022: 11 (transfer from Nemesiidae to Pycnothelidae).

Diagnosis (modified from Goloboff, 1995: 168): Males can be distinguished from those of other genera by the presence of a single retrolateral-distal megaspine on tibia I, or a retrolateral-distal tibial apophysis with 2-10 apical spines; patella III with 1-1-1 spines and tibiae of legs I-II without a scopula. Females can only be distinguished by the absence of pumpkiniform spigots

Table 2. Summary of results of cladistics analysis.

Analysis	Tree length	Number of trees	Total fit
k-value = 2.149124	73	1	8.562637
k-value = 2.462407	73	1	7.933502
k-value = 2.846891	73	1	7.280374
k-value = 3.329961	73	1	6.600948
k-value = 3.955110	73	1	5.892579
k-value = 4.795828	73	1	5.151171
k-value = 5.986845	73	2	4.371563
k-value = 7.804712	73	2	3.554642
k-value = 10.921057	73	2	2.695133
k-value = 17.500007	73	2	1.786539

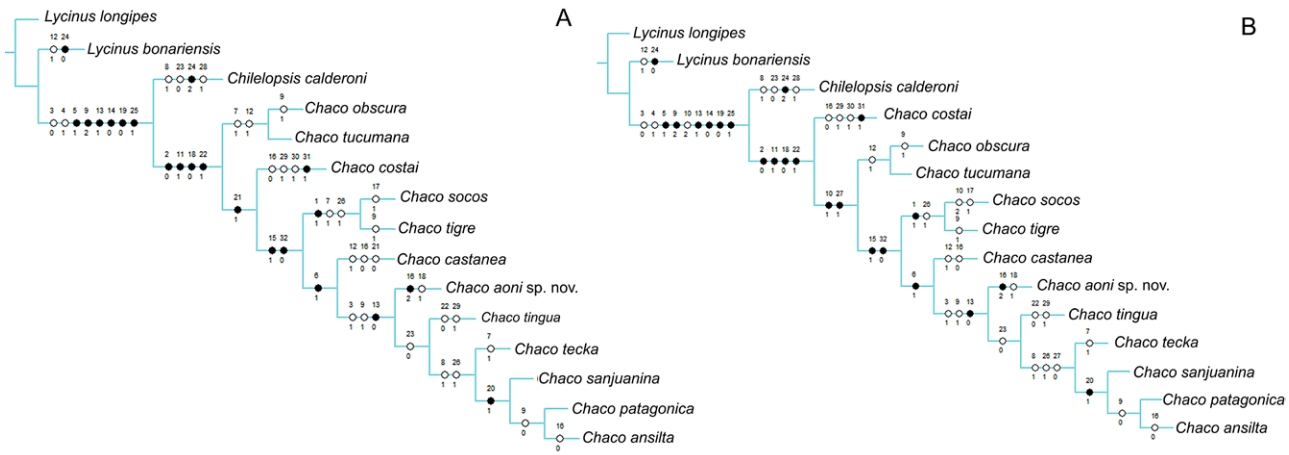

Fig. 1. Different topologies obtained from the cladistic analysis with k-value = 10.921057 (CI = 52, RI = 64).

on their spinnerets and by the absence of a scopula on their tibiae I-II (present in and characteristic of *Prorachias* Mello-Leitão, 1924 and *Pselligmus* Simon, 1892).

Included species: *Chaco ansilta* Ferretti, 2014; *C. aoni* sp. nov.; *C. castanea* Montes de Oca & Pérez-Miles, 2013; *C. costai* Montes de Oca & Pérez-Miles, 2013; *C. obscura* Tullgren, 1905; *C. patagonica* Goloboff, 1995; *C. sanjuanina* Goloboff, 1995; *C. socos* Goloboff, 1995; *C. tecka* Goloboff, 1995; *C. tigre* Goloboff, 1995; *C. tingua* Indicatti, Folly-Ramos, Vargas, Lucas & Brescovit, 2015; *C. tucumana* Goloboff, 1995.

Chaco aoni sp. nov.

Figs 2-8, Table 3

Type material: CAI-IADIZA-4374; male holotype; Argentina, Santa Cruz, Rio Santa Cruz, 50°17'46.31"S, 70°09'57.45"W, 336 m; 26.11.2016; *leg.* R. Carrara, S. Roig-Juñent, G. Cheli, G. Flores. – CAI-IADIZA-4375, 4376, 4377; 1 female and 2 males paratypes; same data as for the holotype.

Etymology: "Aoni" means "south" in the Tehuelche language of the native people of Patagonia. The specific name refers to the fact that this is the southernmost known *Chaco* species.

Diagnosis: *Chaco aoni* sp. nov. can be distinguished from congeners by the presence of numerous spines on all legs. Males of *C. aoni* sp. nov. resemble those of *Chaco ansilta* and *C. tigre* in general aspect, size and shape of the male palpal organ. They differ from males of *C. ansilta* by having more keels on the palpal organ [about 20 in *C. aoni* sp. nov. (Figs 3A-B, 5A-C) versus about seven in *C. ansilta*], by the higher number of maxillary cuspules [between 15-21 in *C. aoni* sp. nov. (Fig. 6E) versus 7-10 in *C. ansilta*], and by lacking ventral spines on metatarsus I. Males of *C. aoni* sp. nov. can be easily distinguished from males of *C. tigre* in the number of spines on the tibial I apophysis (two in *C. aoni* sp. nov. versus four in *C. tigre*). The female paratype of *C. aoni* sp. nov. resembles females of *C. tecka* and *C. tigre* in the shape of their spermathecae, but it can be distinguished by the straighter and shorter receptacular stalks and by the smaller, rounded receptacular heads (Fig. 6G). Regarding somatic characters, the female of *C. aoni* sp. nov. differs from females of *C. tecka* in the absence of pseudo-preening-combs on its legs (Fig. 6F) and from females of *C. tigre* in the smaller body size, lower number of labial cuspules (Fig. 6D) and denser scopulae on all leg tarsi.

Description: MALE HOLOTYPE. Color in ethanol: Carapace, chelicerae and legs light brown (Fig. 2A); abdomen uniformly light brown. Total length 6.03. Carapace 3.28 long, 2.85 wide. Abdomen 1.72 long, 1.63 wide. Clypeus 0.13 long, with a few bristles. Fovea transverse and straight, 0.30 wide. Eyes on low tubercle; OQ 0.43 long, 0.63 wide (Fig. 2C). Eye sizes and inter-distances: AME 0.14, ALE 0.19, PME 0.10, PLE 0.15; AME-AME 0.13, AME-ALE 0.08, PME-PME 0.28, PME-PLE 0.04, ALE-PLE 0.11. Sternum length 1.70, width 1.04; sigilla inconspicuous (Fig. 2B).

Table 3. Lengths of legs and palp of the male holotype (♂) and the female paratype (♀) of *Chaco aoni* sp. nov.

		Leg I	Leg II	Leg III	Leg IV	Palp
Femur	♂	2.90	2.96	3.66	4.37	1.92
	♀	?	2.25	2.27	2.61	1.96
Patella	♂	1.61	1.65	1.77	2.09	0.86
	♀	?	1.47	1.04	1.56	0.91
Tibia	♂	2.08	1.92	2.20	3.83	0.95
	♀	?	1.54	1.47	2.21	1.26
Metatarsus	♂	2.27	2.37	3.47	4.54	-
	♀	?	2.05	2.00	2.29	-
Tarsus	♂	2.11	2.12	2.52	2.89	0.49
	♀	?	1.38	1.47	1.77	1.12
Total	♂	10.97	11.02	13.62	17.72	4.22
	♀	?	8.69	8.25	10.44	5.25

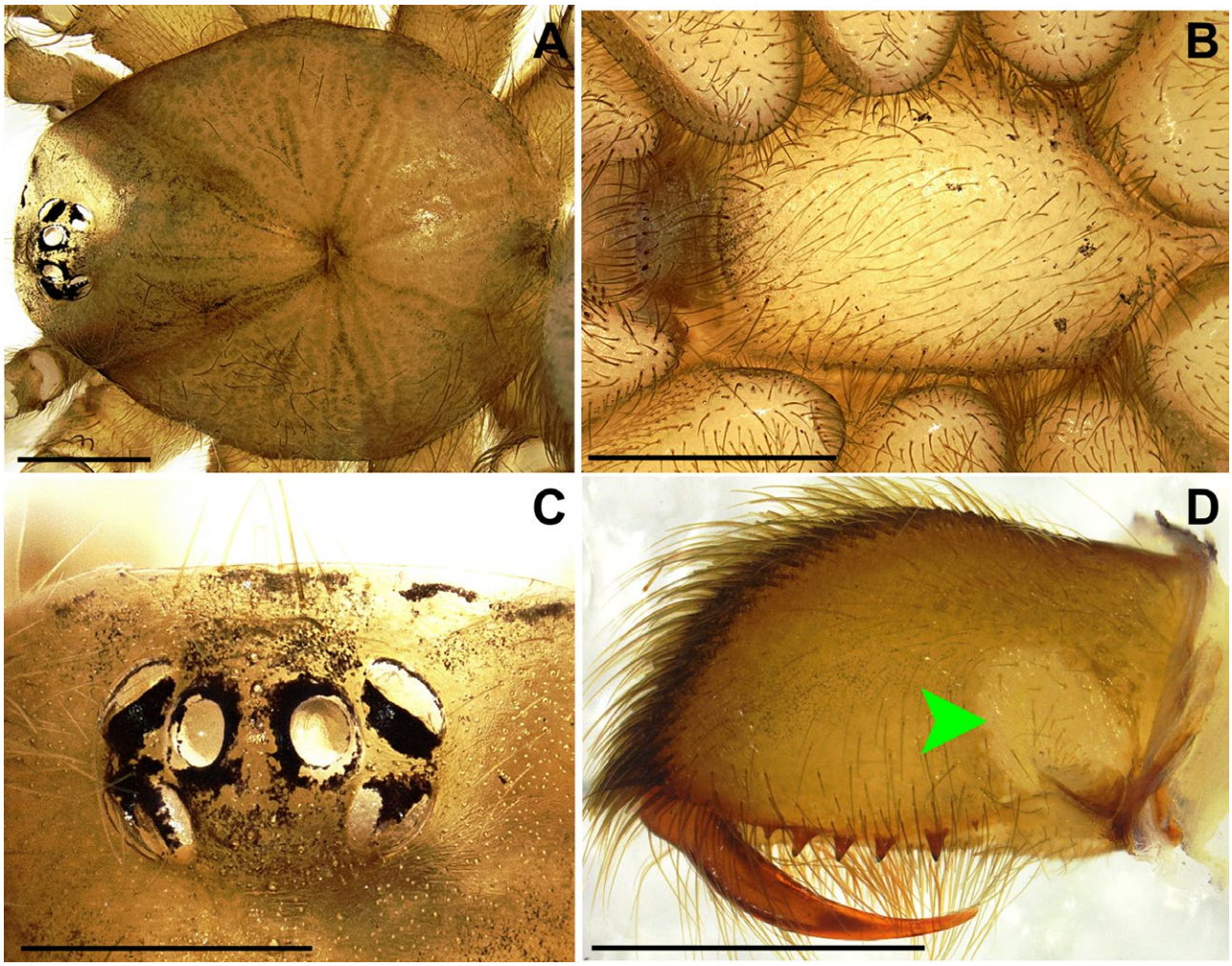

Fig. 2. *Chaco aoni* sp. nov., male holotype. (A) Carapace, dorsal view. (B) Sternum and labium, ventral view. (C) Eyes, dorsal view. (D) Right chelicera, prolateral view (green arrow-head indicates the intercheliceral tumescence). Scale bars: 1 mm (A-B, D), 0.5 mm (C).

Labium 0.21 long, 0.48 wide, with four cuspules. Maxillae with 15 (on right side) and 16 (on left side) cuspules. Cheliceral furrow with two rows of teeth: prolateral row with five large teeth; retrolateral row with 11 smaller, more basal teeth. Rastellum sessile, completely reduced to a group of thin attenuate bristles. Intercheliceral tumescence present, with 22 long thin setae (Fig. 2D). Legs very spiny, with incrassate femora. For lengths of leg and palp segments see Table 3. Scopulae not divided; tarsi I-II fully scopulate; tarsi III-IV scopulate in distal third; metatarsus I scopulate in distal half; metatarsus II scopulate in distal third; metatarsi III-IV without a scopula. All leg tarsi flexible, pseudosegmented in middle portion. All tarsi of legs with only two superior claws carrying two rows of teeth, each row with five (on leg IV) to 10 (on leg I) teeth; no inferior claws (Fig. 4A-B). Palp with incrassate patella; ventral side of palpal tibia concave in lateral view, with incrassate base; copulatory organ (= bulb) pyriform, with thin, long and straight embolus and with about 20 low parallel keels in transition zone between bulbous part and embolus (Figs 3A-B, 5A-C). Spinulation: All tarsi spineless. Femora: palp 0-0-0-2 D; I 1-2-4-2 D; II 2-2-3-2 D, 1-1-1-0 P; III 1-2-2-1 D, 0-1-1-1 P; IV 2-1-2-3 D, 0-1-0-2 P. Patellae: palp 0-0-0-1 P; I 1-1-1-0 P, 0-0-0-1 R, 0-0-0-1 V; II 1-1-1-0 P; III 1-1-1-0 P, 0-1-0-0 R; IV 0-1-1-0 P, 0-0-1-0 R. Tibiae: palp 2-0-0-0 D, 1-1-2-0 P, 0-0-0-1 R; I 1-0-1-0 R, 2-0-1-0 P, 2-0-2-0 V; II 1-0-1-1 P, 0-1-1-0 R, 2-0-2-3(ap) V; III 0-0-0-2 D, 1-1-1-0 P, 1-1-2-0 R, 2-2-0-3(ap) V; IV 0-1-2-2 D, 0-0-0-1 P, 0-1-1-0 R, 3-2-0-3(ap) V. Metatarsi: I 0-2-3-0 D, 1-1-0-0 P, 0-1-1-0 R; II 1-2-3-0 D, 1-1-0-1 P, 0-1-1-0 R, 2-0-0-0 V; III 4-1-2-3 D, 2-2-0-1 P, 1-0-1-0 R, 3-0-2-3(ap) V; IV 1-1-2-2 D, 4-2-2-1 P, 1-0-1-1 R, 1-0-1-2(ap) V. Retrolateral-distal tibial apophysis well-developed, short, carrying two short spines (Figs 3C, 5D). Spinnerets badly preserved; only articulate spigots (*sensu* Goloboff, 1995) discernible (Fig. 4F).

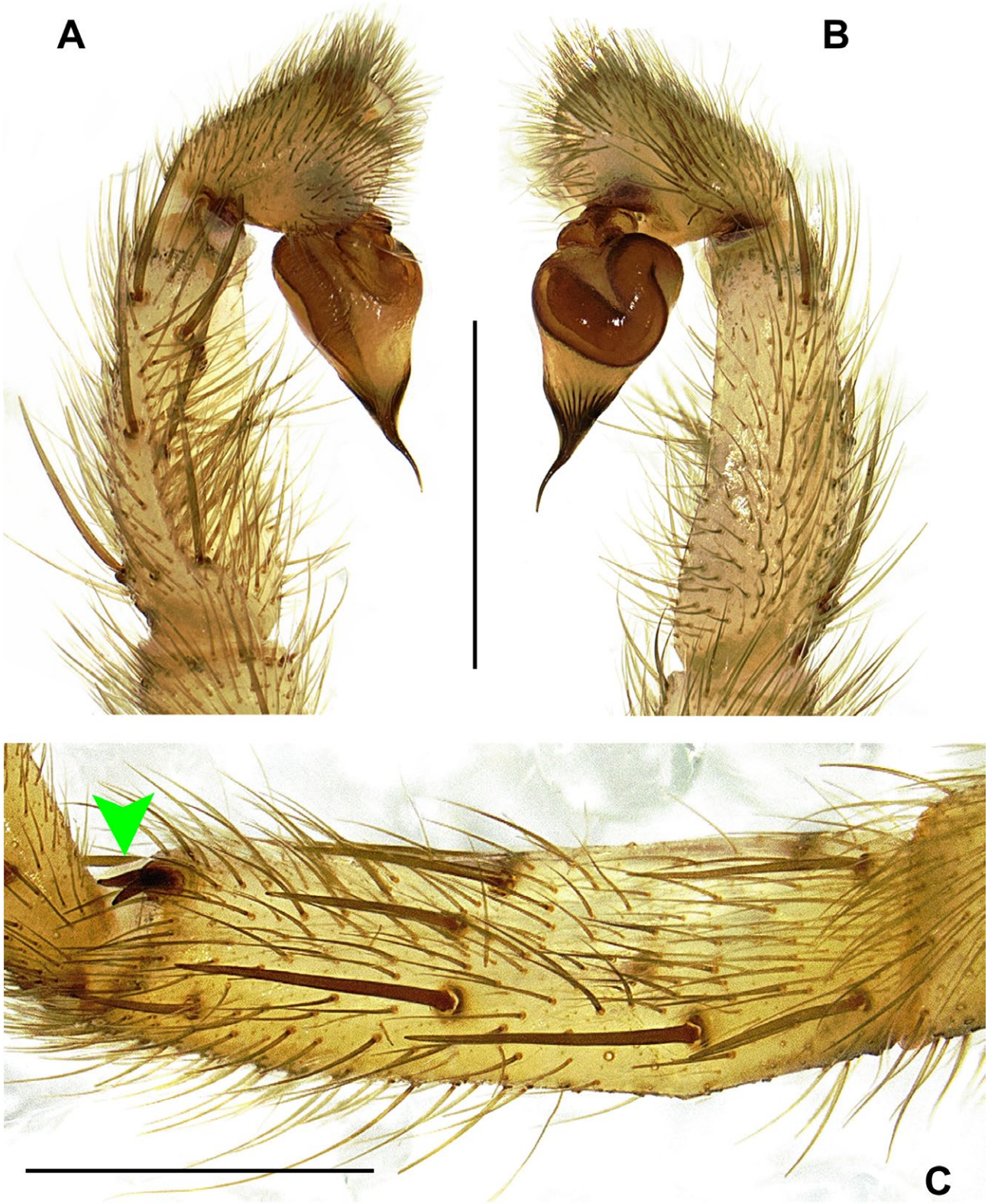

Fig. 3. *Chaco aoni* sp. nov., male holotype. (A) Left palpal organ, prolateral view. (B) Same, retrolateral view. (C) Tibia of leg I, proventral view (green arrow-head indicates the spines on the tibial apophysis). Scale bars: 1 mm.

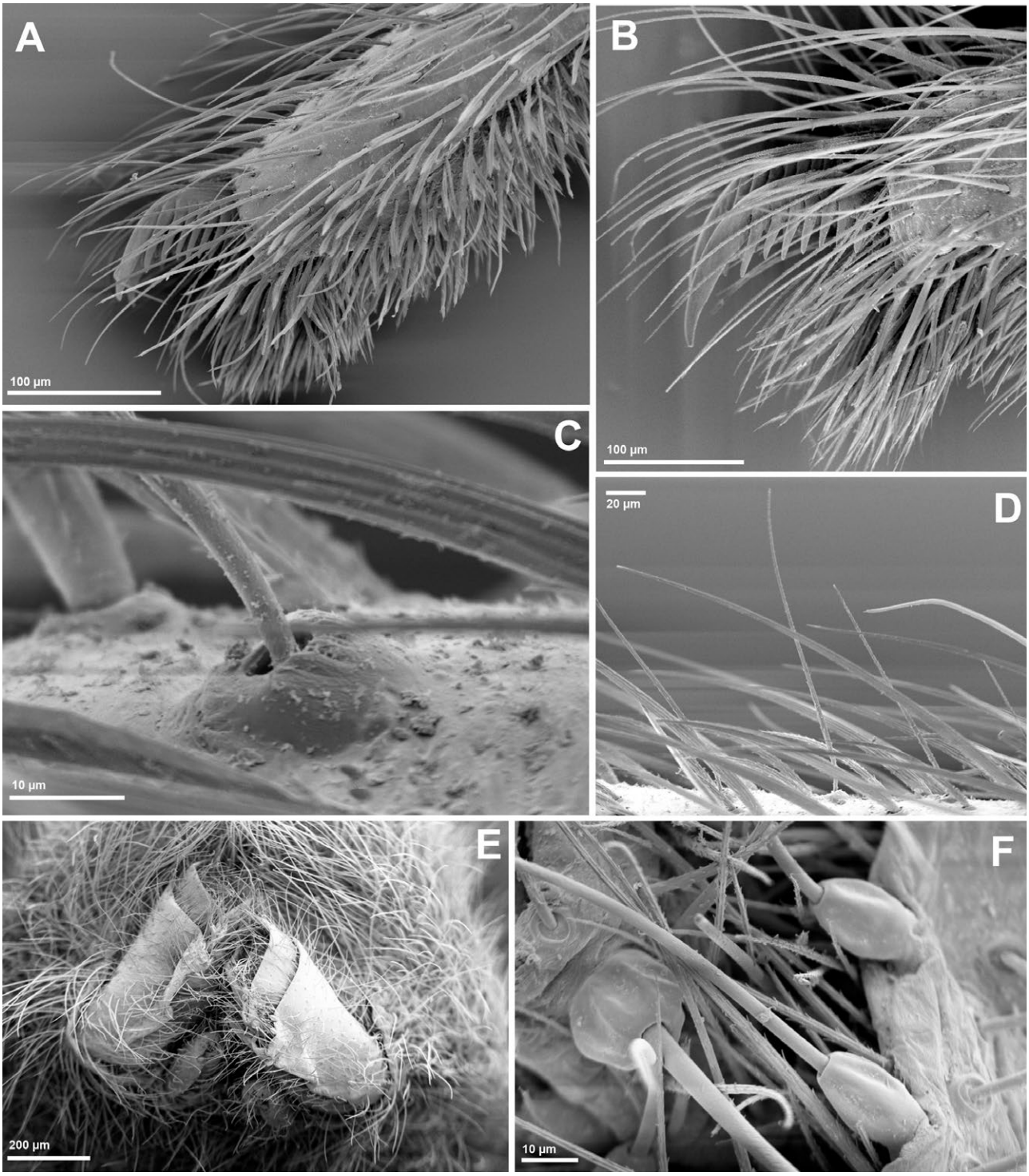

Fig. 4. *Chaco aoni* sp. nov. (A) Tarsus I, prolateral view. (B) Tarsus IV, prolateral view. (C) Detail of trichobothrial base. (D) Trichobothria on tarsus I, lateral view. (E) Spinnerets, ventral view. (F) Articulate spigots on PLS.

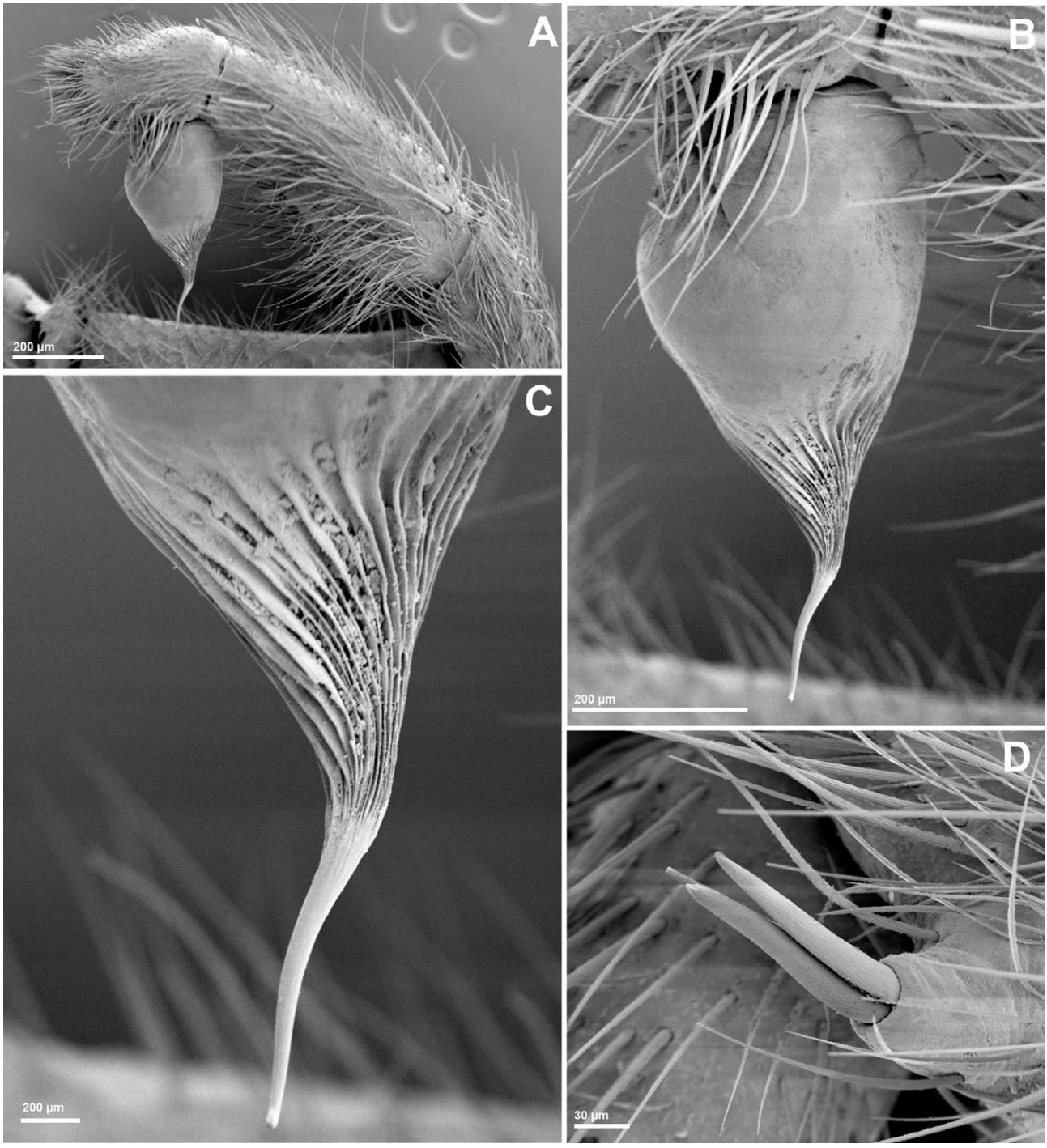

Fig. 5. *Chaco aoni* sp. nov., male holotype. (A) Palp, retrolateral view. (B) Palpal organ, retrolateral view. (C) Detail of keels on palpal organ. (D) Right leg I, retrodorsal view.

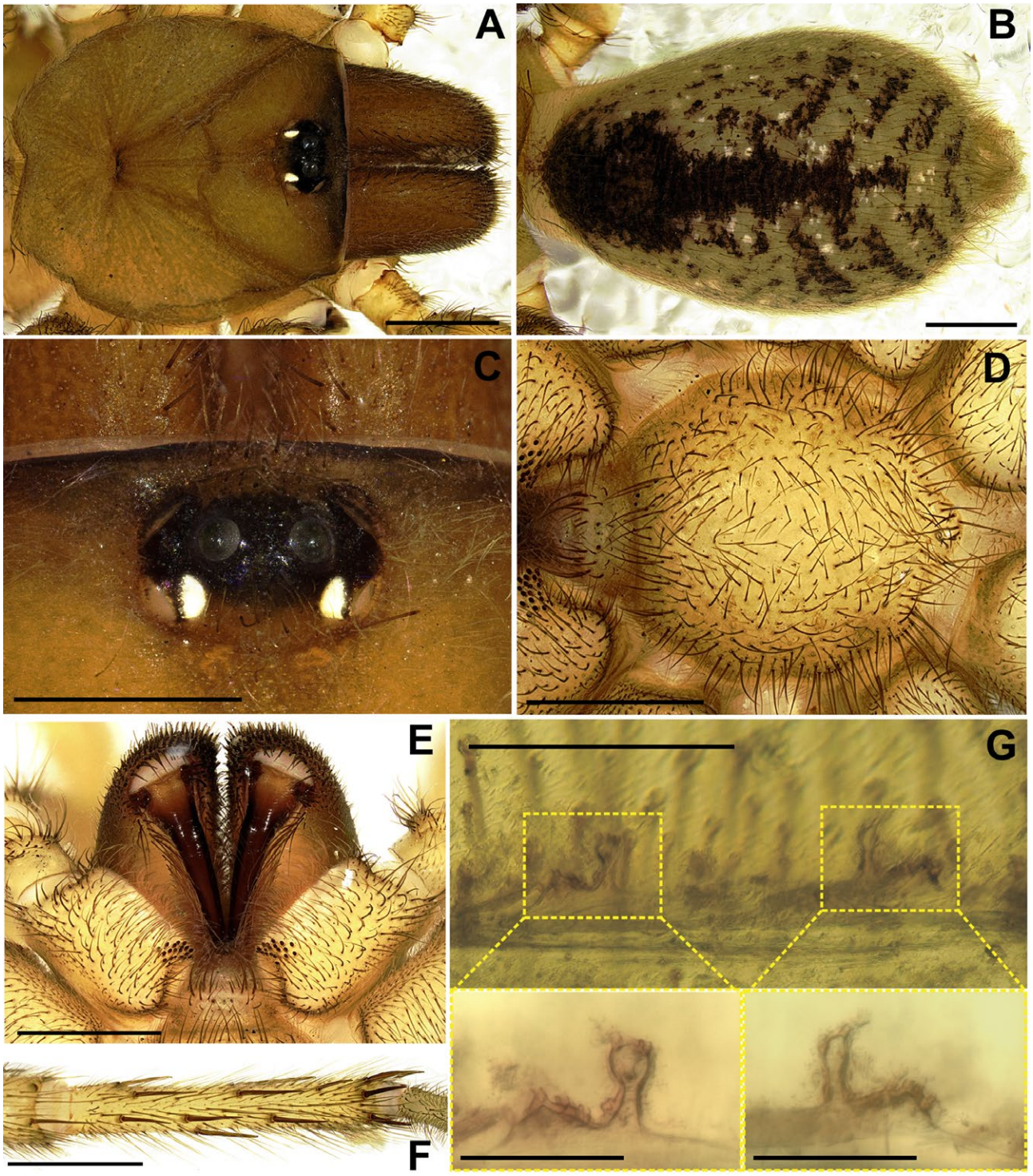

Fig. 6. *Chaco aoni* sp. nov., female paratype. (A) Carapace, dorsal view. (B) Abdomen, dorsal view. (C) Eyes, dorsal view. (D) Sternum and labium, ventral view. (E) Chelicerae, labium and maxillae, ventral view. (F) Tibia IV, ventral view. (G) Spermathecae, dorsal view. Scale bars: 1 mm (A-F), 0.5 mm (G).

FEMALE PARATYPE (CAI-IADIZA-4375). Color in alcohol: same as in male, except for brownish abdomen with dark fish-bone pattern (Fig. 6A-B). Total length 8.21. Carapace 3.48 long, 3.09 wide. Abdomen 4.86 long, 2.95 wide. Clypeus 0.11 mm long, with at least seven bristles. Fovea transverse and straight, 0.26 wide. Eyes on low tubercle; OQ 0.53 long, 0.73 wide (Fig. 6C). Eye sizes and inter-distances: AME 0.13, ALE 0.22, PME 0.14, PLE 0.19; AME-AME 0.15, AME-ALE 0.11, ALE-PLE 0.10, PME-PLE 0.02, PME-PME 0.36. Sternum length 1.86, width 1.84; sigilla inconspicuous (Fig. 6D). Labium 0.28 long, 0.74 wide, with three cuspules. Maxillae with 21 (on right side) and 19 (on left side) cuspules (Fig. 6E). Cheliceral furrow with two rows of teeth: prolateral row with eight large teeth; retrolateral row with six smaller, more basal teeth. Rastellum sessile, strong and well-developed, composed of short and thick spines (Fig. 6E). Both legs I missing from the specimen. Remaining legs less spiny than in males, with incrassate femora. Lengths of leg and palpal segments are shown in Table 3. Scopulae not divided; tarsi of palps and legs II-IV fully scopulate; metatarsus II scopulate in distal half;

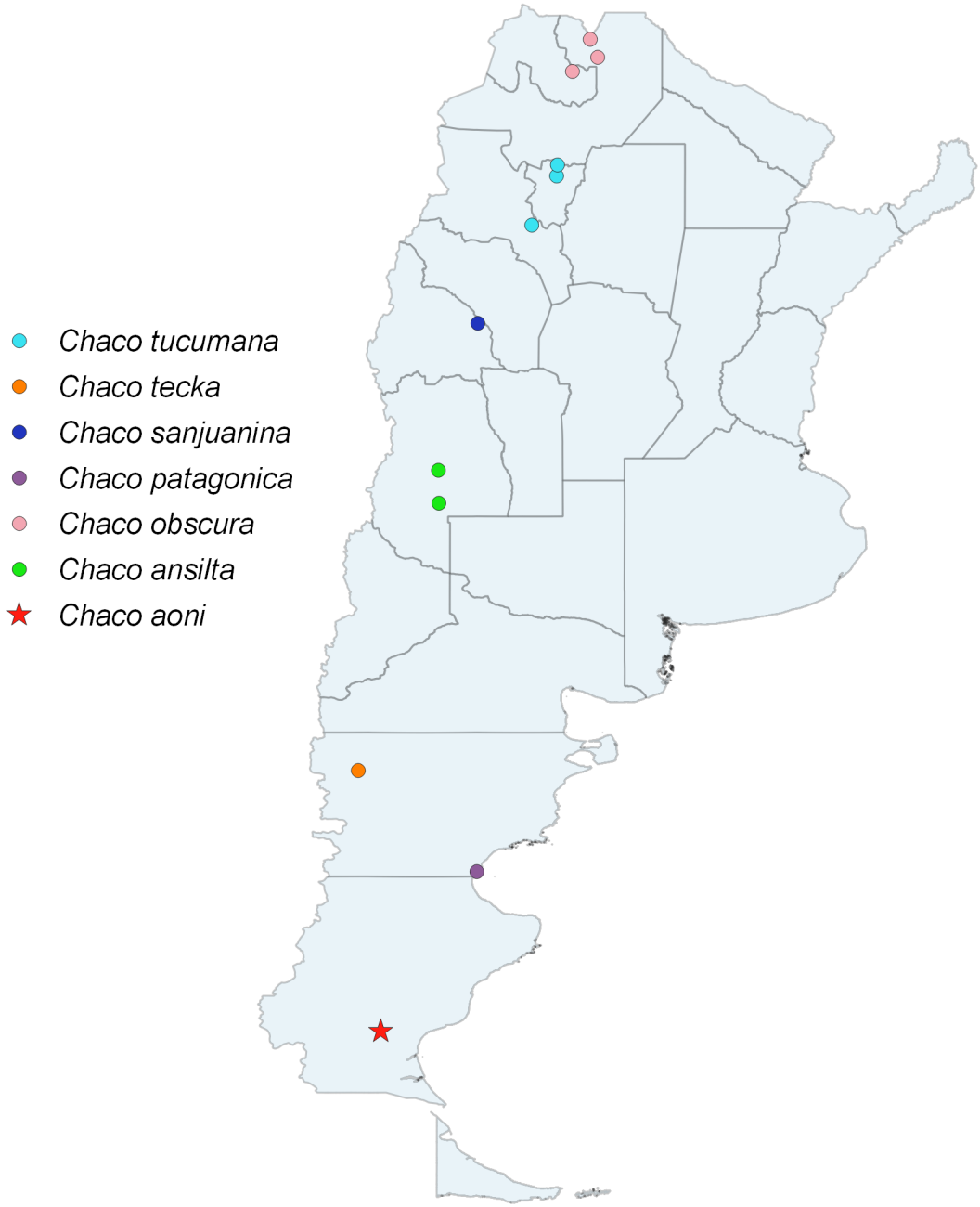

Fig. 7. Locality map of the known species of *Chaco* in Argentina.

metatarsi III-IV without a scopula. All tarsi not flexible. Two superior claws on all leg tarsi; no inferior claws. Palpal claw with eight teeth; superior leg claws with two rows of six (on leg IV) to eight (on leg II) teeth. Four spinnerets; PMS with one segment, 0.39 long; PLS with three segments: basal segment 0.43 long, median segment 0.23 long, apical segment 0.15 long. Spinulation: All tarsi spineless. Femora: II 1-1-2-1 D; III 1-0-1-0 D; IV 1-2-2-0 D. Patellae: palp 1-0-0-0 P; III 0-1-1-0 P; IV 0-1-0-0 R. Tibiae: palp 1-1-0-0 P, 2-1-1-3(ap) V; II 0-0-1-0 P, 1-1-0-0 V; III 2-0-3-0 D, 1-0-1-0 P, 1-0-1-0 R, 2-2-0-2(ap) V; IV 1-0-1-0 R, 2-0-2-2(ap) V. Metatarsi: II 1-1-0-0 V; III 2-2-0-2 D, 2-2-0-1(ap) P, 1-0-0-2(ap) V; IV 0-3-1-2(ap) D, 0-2-1-1(ap) P, 1-1-0-0 R, 0-3-3-3(ap) V.

Spermathecae with two receptacles composed of a short straight stalk and a reniform head, each arising from a low, wide dome (i.e. slightly domed lateral part of genital atrium, both parts separated by a narrow median bridge; Fig. 6G).

Distribution and natural history: This species is only known from the banks of the Río Santa Cruz, in southern Santa Cruz Province, Argentina (Fig. 7). The spiders examined were collected with pitfall traps during field work for an environmental impact assessment. Traps consisted of plastic cups, filled with 30% propylene glycol, water and a drop of detergent, which were left buried in the soil for 10 days. The site where the spiders were found lies in the Patagonian Steppe (Roig-Juñent *et al.,* 2018), and it is subject to a cold and semi-arid climate with an annual mean temperature of 11°C and an average annual rainfall of 240 mm (data obtained from the National Meteorological Service). The habitat of these spiders is characterized by patches of small shrubs [*Azorella* sp., *Berberis* sp., *Schinus* sp., *Mulguraeae tridens* (Lag.)] and grasses (mainly *Stipa* sp.), and the soil is mostly sandy, with some clast and clay (Roig-Juñent, pers. com.) (Fig. 8A-B). Mature males found in pitfall traps during November indicate that they were walking around in search for females and that the mating period of the species lies in that month.

DISCUSSION

The main differences between the two topologies of our cladistics analyses (Fig. 1) are found in the position of *C. costai*. One tree shows this species as sister to all other representatives of *Chaco*; the other tree gives *C. obscura* + *C. tucumana* as the sister group of the remaining species, with *C. costai* as basal within a clade supported by the synapomorphic presence of two long dorsal setae on the palpal tibia. *Chaco aoni* sp. nov. was also found to be the sister species of a clade comprising *C. tingua*, *C. tecka*, *C. sanjuanina*, *C. patagonica* and *C. ansilta*. This monophyletic group is supported by the synapomorphy scopula of legs IV absent or very light, and it shares two homoplasic characters: anterior median eyes much larger than posterior median eyes, and 11-30 maxillary cuspules present in females.

Chaco aoni sp. nov. is the 12th species described in the genus, and the southernmost congener known to date. This new record is about 530 km further south than the previously southern-most known species, *C. patagonica*. *Chaco aoni* sp. nov. shows features similar to those of *C. ansilta*, such as tibia I apophysis with two spines and the general aspect of the palpal organ in males. It is important to note that this is the second species of the genus possessing two spines on the tibial apophysis of leg I in males. Therefore the generic diagnosis should include tibia I of males with only one megaspine and no apophysis (*C. tingua*), as well as tibia I of males with an apophysis carrying two to ten apical spines (*C. costai*).

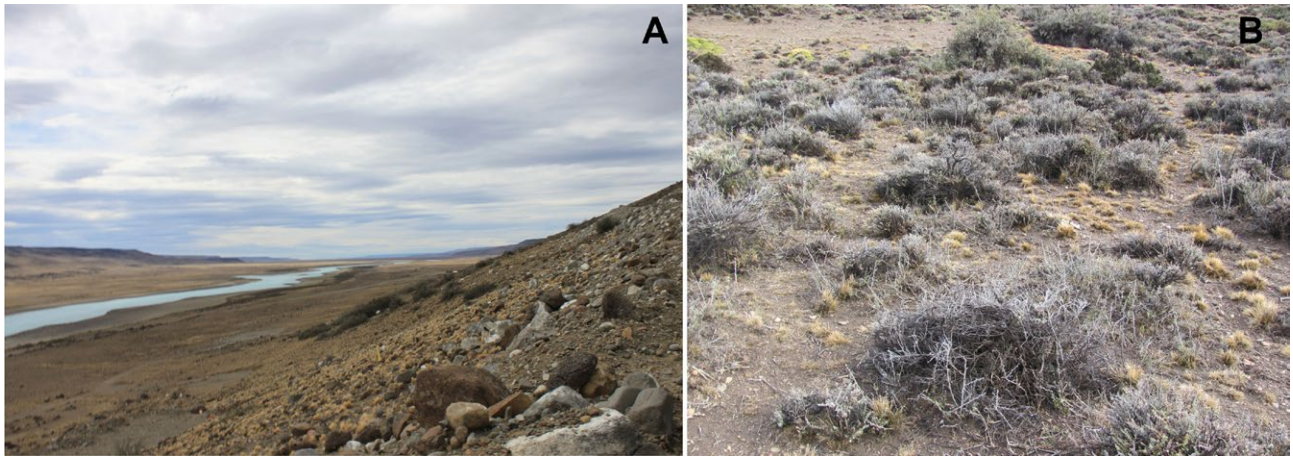

Fig. 8. Habitat at the type locality of *Chaco aoni* sp. nov. in the Patagonian Steppe. (A) Landscape (Photo: Sergio Roig-Juñent). (B) Site where pitfall traps were placed (Photo: Germán Cheli).

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