

Research article

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Update in the Peruvian Caponiidae: New records and new species of *Nyetnops* Platnick & Lise, 2007 (Araneae: Caponiidae)

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Abstract. An update on the diversity and distribution of Caponiidae from Peru is presented. New distributional records for *Caponina cajabamba* Platnick, 1994 are given and the male is described for the first time. Additionally, three new species of the genus *Nyetnops* Platnick & Lise, 2007 are described: *Nyetnops alexanderi* Villarreal & Martínez sp. nov. (♂♀), *Nyetnops madre* Villarreal & Martínez sp. nov. (♂♀) and *Nyetnops josei* Villarreal & Martínez sp. nov. (♂). The taxonomic key proposed by Sánchez-Ruiz *et al.* (2020) for *Nyetnops* is updated to include all the described species as well as the new ones proposed herein. Maps showing the distribution of the records of Caponiidae species in Peru, mainly focused on the genus *Nyetnops* is included.

Key words. Arachnida, *Caponina*, Neotropic, Synspermiata.

Villarreal-Blanco E., Martínez L. & Eyes-Escalante M. 2024. Update in the Peruvian Caponiidae: New records and new species of *Nyetnops* Platnick & Lise, 2007 (Araneae: Caponiidae). *European Journal of Taxonomy* 932: 204–224. <https://doi.org/10.5852/ejt.2024.932.2523>

Introduction

Caponiidae Simon, 1890 is a family of haplogynae spiders' with the bulk of its diversity distributed in tropical regions, particularly in the Neotropic where is represented by 15 of the 20 described genera (World Spider Catalog 2024). The largest species richness in the Americas is grouped in *Nops* MacLeay, 1839, currently with 38 proposed species, followed by *Caponina* Simon, 1892 with 13 (World Spider Catalog 2024; Sánchez-Ruiz & Bonaldo 2023).

A great part of this diversity has been recently discovered (e.g., Platnick & Lise 2007; Jiménez *et al.* 2011; Sánchez-Ruiz *et al.* 2015, 2022; Duperre 2014; Galán-Sánchez & Álvarez-Padilla 2022). However, in some countries, the knowledge about the diversity and distribution of the family remains largely neglected. Specifically, this is the case for Peru, a country boasting both a multitude of diverse ecosystems and a vast range of altitudes, extending from sea level to a staggering 6757 meters atop Huascarán in the Andes Mountain Range (Polk *et al.* 2019).

With regard to the fauna of Caponiidae, only four species have been recorded in the country, based on a few specimens, including *Caponina cajabamba* Platnick, 1994, with only one female individual from its type locality in Cajamarca; *Nops bellulus* Chamberlin, 1916, which was considered as a ‘species inquerenda’ by Sanchez-Ruiz & Brescovit (2018) because it was based on a single immature from Ollantaytambo, Cusco; *Nyetnops naylienae* Sánchez-Ruiz, Brescovit & Bonaldo, 2020, and *Nopsma enriquei* Sánchez-Ruiz, Brescovit & Bonaldo, 2020 from Huanuco. Furthermore, Jiménez *et al.* (2011) reported an immature specimen with the same somatic characters as *Nopsides* Chamberlin, 1924 indicating that this genus could also be represented in the country, but because of its juvenile nature, its identity could not be established (Jiménez *et al.* 2011).

Nyetnops Platnick & Lise, 2007 was described by Platnick & Lise (2007) with specimens from Paraná, Rio Grande do Sul and Santa Catarina in Brazil. The genus was placed in the subfamily Nopinæ Petrunkevitch, 1939 by the subsegmented tarsi; the authors suggested it as one of the basal members of the subfamily due to the lack of modifications on the anterior legs (i.e., crista, gladius, and arolium) (Platnick & Lise 2007: 2). However, considering new information, such as the discovery of the new genera *Nopsma* Sánchez-Ruiz, Brescovit & Bonaldo, 2020, *Roddemberryus* Sánchez-Ruiz-Bonaldo, 2023, and *Aamaunops* Galán-Sánchez & Álvarez-Padilla, 2022, this hypothesis has been tested with a new phylogenetic assessment for the subfamily Nopinæ, in which *Nyetnops* is not among the basal members of this subfamily (Sánchez-Ruiz *et al.* in press).

Currently, the genus is supported by several characters, such as the general shape of the bulb, which together with the embolus is very elongate. Recently, Sánchez-Ruiz *et al.* (2020) made a modern revision of the genus, where *Nyetnops juchuy* Dupérré, 2014 was transferred to their new genus *Nopsma* and three species of *Nyetnops* were described: *N. naylienae* Sánchez-Ruiz, Brescovit & Bonaldo, 2020, *N. lachonta* Sánchez-Ruiz, Brescovit & Bonaldo, 2020 and *N. buruti* Sánchez-Ruiz, Brescovit & Bonaldo, 2020, expanding the knowledge of the morphology and distribution of the genus. Thus, to date the genus is composed of four species distributed in Brazil, Peru and Bolivia (Sánchez-Ruiz *et al.* 2020; World Spider Catalog 2024).

Herein, we present the description of three new species of *Nyetnops* from Peru: *Nyetnops madre* Villarreal & Martínez sp. nov., *N. alexanderi* Villarreal & Martínez sp. nov., both based in male and female, and *Nyetnops josei* Villarreal & Martínez sp. nov., based on one male; also, we update the key and the distribution map proposed by Sánchez-Ruiz *et al.* (2020). Additionally, we describe for the first time the male of *Caponina cajabamba* and we include new distributional records for this species.

Material and methods

The specimens herein examined are deposited in the Universidad Nacional Mayor de San Marcos (MUSM–ENT, D. Silva), Lima, Peru.

Descriptions were made following the general taxonomic method and description format proposed in Sanchez-Ruiz & Brescovit (2018) and Sánchez-Ruiz *et al.* (2020). Coloration patterns were described based on specimens preserved in 70–80% ethanol. For the description, all the measurements are expressed in millimeters and were taken with a Leica S8AP0 stereo microscope. Among the sexual

characters commonly used to diagnose the species of *Nyctnops* (see Sánchez-Ruiz *et al.* 2020) the length of the copulatory bulb (tegulum + embolus) has proved to be useful. This measure is taken from a straight line from the base of the bulb to the embolar tip. Interocular measurements were included based on Petrunkevitch (1925).

Female genitalia were dissected with fine forceps and scalpel, and their soft tissues were digested for 24 hours by immersion in a solution of pancreatin based on Álvarez-Padilla & Hormiga (2007) for better visualization of internal structures.

The multifocal images of the copulatory structures were taken with a Leica MC–190 HD, digital camera attached to a Leica S8AP0, and DM500 Leica stereo microscope and microscope, respectively, with extended focal range. All multifocal images were assembled with Helicon Focus Pro ver. 6.6. All images of male genitalia are from left palps, except when mentioned. SEM images were generated using a Zeiss Gemini SEM 360 Electron Microscope at the Museo Argentino de Ciencias Naturales Bernardino Rivadavia. The structures mounted on SEM stubs were preserved and labeled with the same collection code and number as the voucher specimen.

The figures and plates were edited and prepared in Adobe Photoshop® CS ver. 12.0. Maps were obtained in QGIS (QGIS Development Team 2021). Locality coordinates are presented in brackets and were obtained from specimen labels, or when not available estimated via online through GeoNames or Google Earth (GeoLocator© Development Team 2021).

Institutional abbreviations

CAS	=	California Academy of science, California, USA
CICRA	=	Centro de Investigación y Capacitación Río Los Amigos, Madre de Dios, Peru
MUSM	=	Museo de Historia Natural de la Universidad Nacional Mayor de San Marco, Lima, Peru

Abbreviations for anatomical terms

ap	=	anterior plate
dmr	=	distal margin of receptaculum
ess	=	external sclerotization around spiracles
ess	=	external sclerotization around spiracles
go	=	genital opening
lep	=	lateral extensions of posterior plate
PME	=	posterior median eyes
pp	=	posterior plate

Results

Taxonomy

Class Arachnida Cuvier, 1812
Order Araneae Clerck, 1757
Family Caponiidae Simon, 1890
Genus *Caponina* Simon, 1892

Caponina cajabamba Platnick, 1994
Figs 1A–H, 2A–E, 11–12

Diagnosis (updated from Platnick 1994)

The female of this species resembles that of *C. chilensis* Platnick, 1994 in having relatively long epigynal sclerotizations but can be distinguished by the club-shaped anterior extensions of the sclerotizations, which reach almost to the pedicel (Fig. 2D–E). Males of *C. cajabamba* differ from those of *C. chilensis* by a more elongated, less pointed dorsal tubercle on the palpal femur and a wider embolar base, and from



Fig. 1. *Caponina cajabamba* Platnick, 1994. A–B, E, G. ♂ (MUSM–ENT 0515824). C–D, F, H. ♀ (MUSM–ENT 0515825). A–B. Habitus, dorsal view. C–D. Habitus, ventral view. E–F. Prosoma, dorsal view. G–H. Prosoma, ventral view. Scale bars = 1 mm.

those of *C. paramo* Platnick, 1994 by having the embolar base proximal instead posteriorly directed as in *C. paramo* (Fig. 2A–C).

Type material

Holotype

PERU • ♀, not examined; Cajamarca, at an elevation of 3000–3100 m above Cajabamba; 25 Sep. 1955; W.K. Weyrauch leg.; CAS.

Other material

PERU • 1 ♂; Lima, Huaral; 11°23'14" S, 77°17'18" W; alt. 412 m; Nov. 2018; M. Lozano leg.; MUSM–ENT 0515824 • 1 ♀; same collection data as for preceding; MUSM–ENT 0515825 • 1 ♂, 2 ♀♀, 3 juvs; same collection data as for preceding; MUSM–ENT 0515823 • 3 ♀♀; same collection data as for preceding; MUSM–ENT 0515826 • 1 ♀, 3 juvs; same collection data as for preceding; MUSM–ENT 0515827.

Description

Male (MUSM–ENT 0515824)

COLORATION (Fig. 1A–B, E, G). Carapace light orange with slightly darker edges. Chelicerae, endites, labium, and sternum light orange. Legs pale yellow. Abdomen: dorsally and ventrally light gray, without noticeable pattern (Fig. 1A–B, E, G). Spinnerets light gray.

MEASUREMENTS. Total length 4.68; carapace length 1.82; width 1.50; height 0.25. Clypeus height 0.25. Eye diameters and interdistances: PME 0.15, PME–PME 0.34. Chelicerae length 0.59. Sternum length 1.24; width 1.09. Legs: I: 5.39; II: 5.52; III: 4.05; IV: 6.36. Abdomen length 2.90.

PALP. Cymbium more than 2 × as long as tibia, rounded tip, tegulum oval, with long embolus protruding prolaterally from the middle surface of tegulum, with a wide curved anteriorly, third distal from the embolus less sclerotized, specially retrolateral side, tip very pointed (Fig. 2A–C).

Female (MUSM–ENT 0515825)

COLORATION AND ABDOMINAL PATTERN. As male, but with vivid color tones (Fig. 1C–D, F, H).

MEASUREMENTS. Total length 5.58, carapace length 1.81, width 1.62, height 0.43. Clypeus height 0.28. Eye diameters and interdistances: PME 0.14, PME–PME 0.34. Chelicerae length 0.76. Sternum length 1.27, width 1.07. Legs: I: 6.14; II: 6.09; III: 5.29; IV: 6.73. Abdomen length 4.09.

GENITALIA. External genital area with weakly sclerotized anterior plate and pair of sclerotized bars visible (Fig. 2D). Internal genitalia with very long pair of sclerotized bars and anterior extensions, reaching virtually to pedicel, anterior extensions club-shaped and fused to the sclerotized bars on its entire length (Fig. 2E).

Variation

Males (n=2): total length: 4.39–4.68; carapace length: 1.73–1.82. Females (n=3): total length: 4.66–5.58; carapace length: 1.79–2.01.

Distribution

Only known from Cajabamba in Cajamarca department and Huaral, Lima (Fig. 11).

Genus *Nyctnops* Platnick & Lise, 2007

Nyctnops Platnick & Lise, 2007: 4.

Type species

Nyctnops guarani Platnick & Lise, 2007 (by original designation).

Diagnosis

See Sánchez-Ruiz *et al.* (2020).

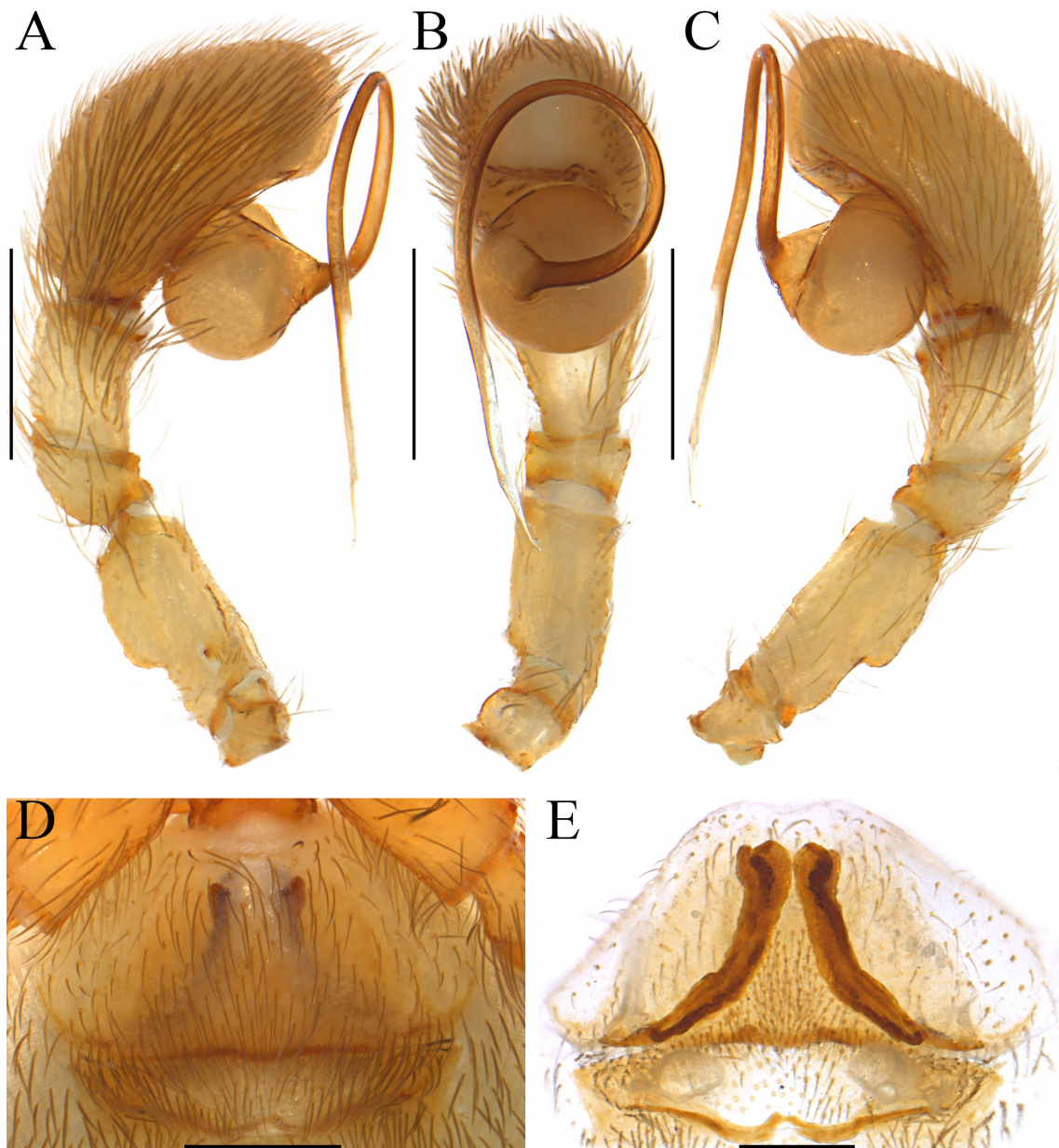


Fig. 2. *Caponina cajabamba* Platnick, 1994. **A–C.** ♂ (MUSM–ENT 0515824). **D–E.** ♀, (MUSM–ENT 0515825). **A.** Left palp, prolateral view. **B.** Left palp, ventral view. **C.** Left palp, retrolateral view. **D.** External genitalia, ventral view. **E.** Internal genitalia, dorsal view. Scale bars: A–C=0.5 mm; D–E=0.25 mm.

Nyetnops alexanderi Villarreal & Martínez sp. nov.
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Figs 3–5, 11–12

Diagnosis

Males of *Nyetnops alexanderi* Villarreal & Martínez sp. nov. resemble those of *N. guarani* Platnick & Lise, 2007, *N. naylienae* and *Nyetnops josei* Villarreal & Martínez sp. nov. by having a copulatory bulb (tegulum+embolus), less than $2.2 \times$ as long as palpal tibia but differ from those of *Nyetnops josei* by the



Fig. 3. *Nyetnops alexanderi* Villarreal & Martínez sp. nov. **A–B, E, G.** ♂, holotype (MUSM–ENT 0506888). **C–D, F, H.** ♀, paratype (MUSM–ENT 0506887). **A–B.** Habitus, dorsal view. **C–D.** Habitus, ventral view. **E–F.** Prosoma, dorsal view. **G–H.** Prosoma, ventral view. Scale bars = 1 mm.

absence of a dorsal abdominal pattern of chevron stripes and from those of *N. naylianae* and *N. guarani* by the tegulum apical section not swollen in the median region for which the tegulum basal and apical sections have the same width (Figs 4A–B, 5A). Females can be differentiated from those of *N. naylianae* by having internal genitalia area with a triangular distal margin of the receptaculum instead of concave and from those of *N. guarani* by the posterior plate narrow and less sharp dorsal margin of receptaculum (Fig. 4C–D).

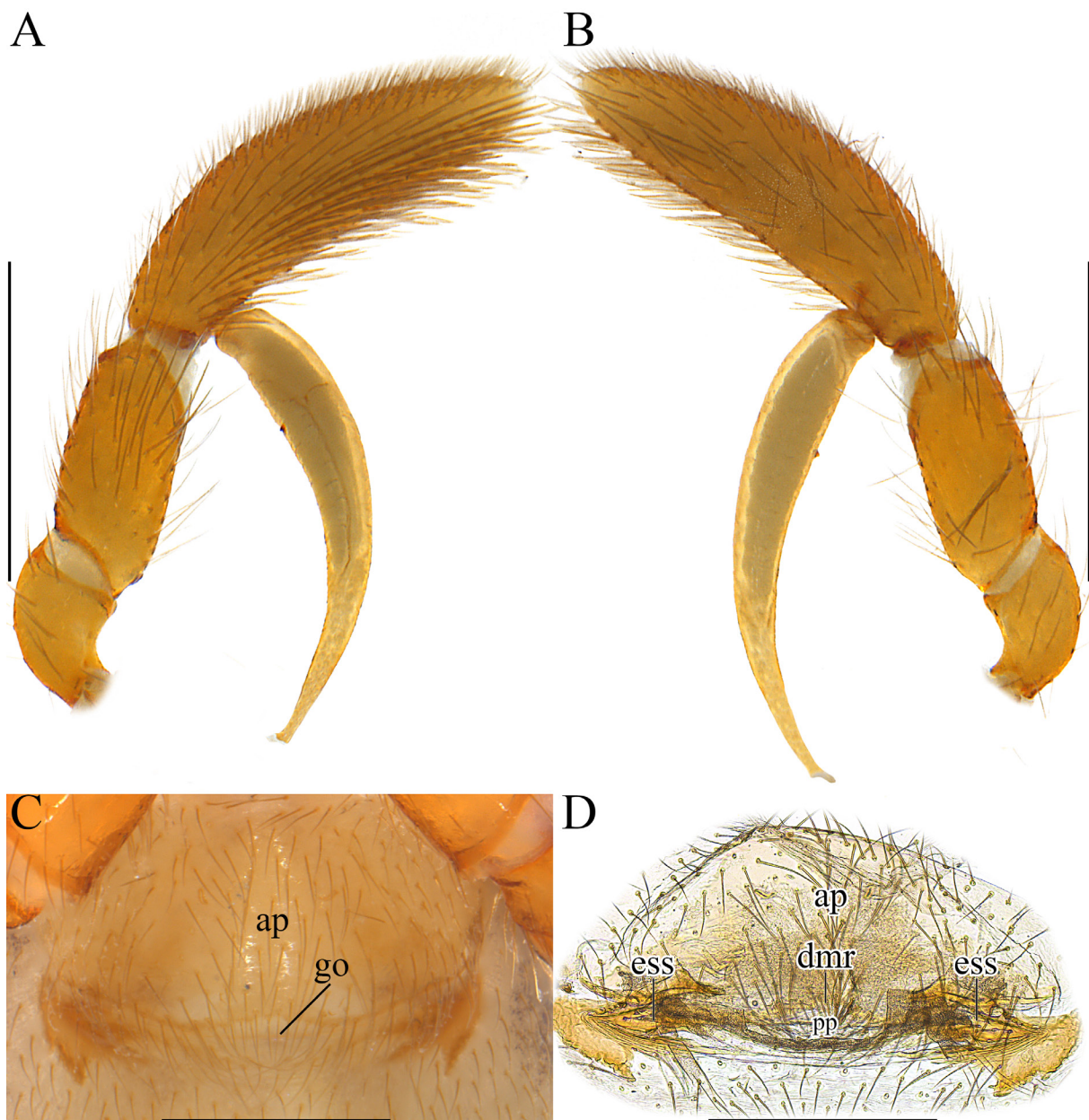


Fig. 4. *Nyetnops alexanderi* Villarreal & Martínez sp. nov. **A–B.** ♂, holotype (MUSM–ENT 0506888). **C–D.** ♀, paratype (MUSM–ENT 0506887). **A.** Left palp, prolateral view. **B.** Left palp, retrolateral view. **C.** External genitalia, ventral view. **D.** Internal genitalia, dorsal view. Scale bars = 0.5 mm.

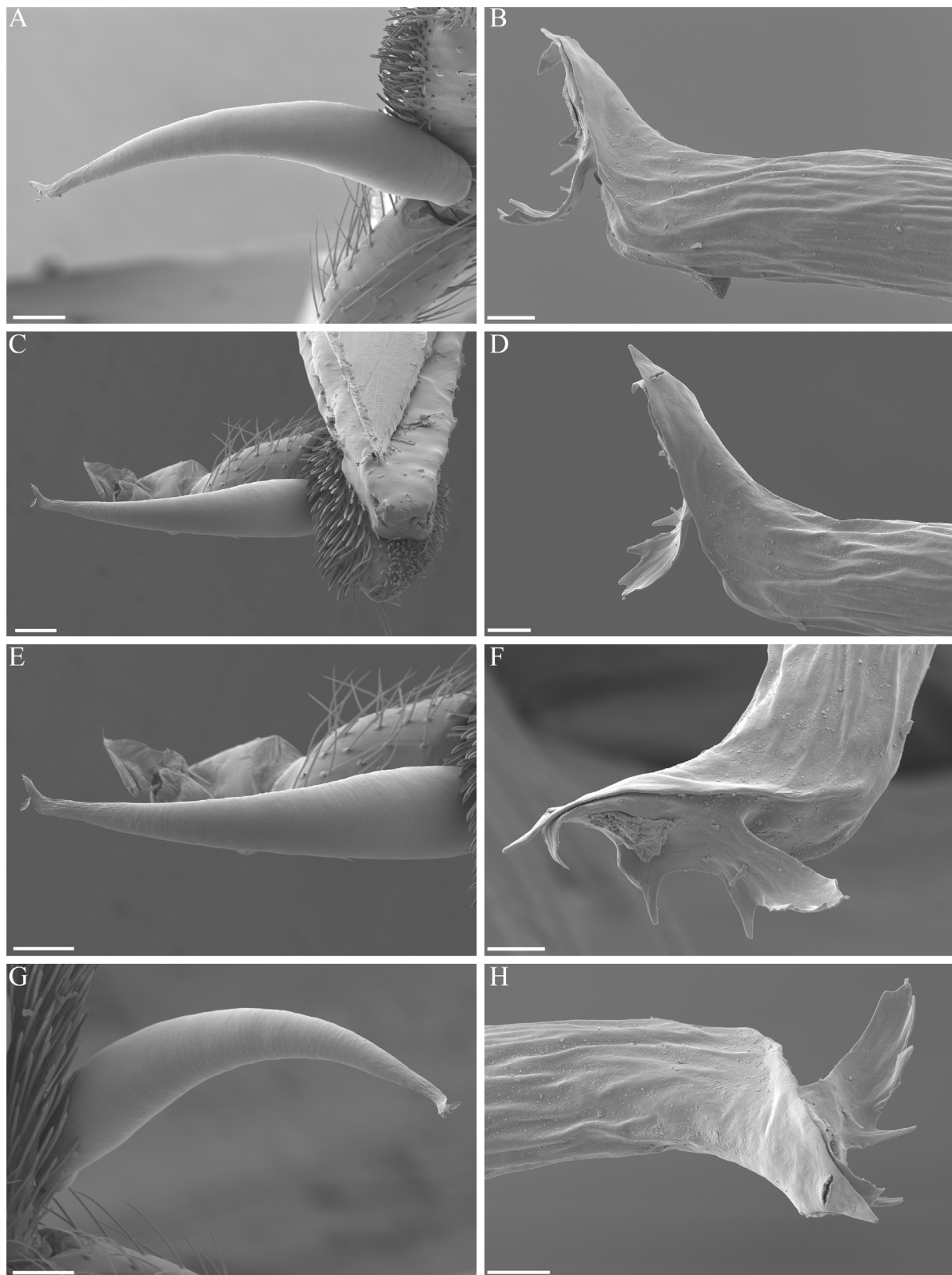


Fig. 5. *Nyetnops alexanderi* Villarreal & Martínez sp. nov., ♂ (MUSM–ENT 0506895). **A.** Copulatory bulb, retrolateral view. **B, D.** Tip of the embolus, retrolateral view. **C, E.** Copulatory bulb, dorsal view. **F.** Tip of the embolus, proventral view. **G.** Copulatory bulb, prolateral view. **H.** Tip of the embolus, prolateral view. Scale bars: A, C, E, G=0.1 mm; B, D, F, H=0.01 mm.

Etymology

The specific epithet is a patronym in honor to Alexander Sanchez Ruiz for his contributions to the understanding of the spiders from Caponiidae family worldwide.

Type material

Holotype

PERU • ♂; Cusco department, Río Camisea, Pagoreni; 11°42'22.5" S, 72°54'10.7" W; alt. 465 m; 7–28 May 1998; S. Cordova leg.; MUSM–ENT 0506888.

Paratypes

PERU • 1 ♀; same collection data as for holotype; MUSM–ENT 0506887 • 1 ♂; same collection data as for holotype; MUSM–ENT 0506892 • 1 ♂; same collection data as for holotype; MUSM–ENT 0506897 • 4 ♂♂; same collection data as for holotype; MUSM–ENT 0506890 • 2 ♂♂; same collection data as for holotype; MUSM–ENT 0506894 • 2 ♂♂; same collection data as for holotype; MUSM–ENT 0506885 • 1 ♂; same collection data as for holotype; MUSM–ENT 0506889 • 3 ♂♂; same collection data as for holotype; MUSM–ENT 0506895 • 1 ♂, 1 ♀; same collection data as for holotype; MUSM–ENT 0506891 • 1 ♂; same collection data as for holotype; MUSM–ENT 051044 • 2 ♂♂, 1 ♂; Cusco department, Río Camisea, Armihuari; 11°5' S, 72°46' W; alt. 560 m; May–Jun. 1997; S. Cordova leg.; MUSM–ENT 0506884.

Other material

PERU • 1 ♂; Madre de Dios department, Boca Río Los Amigos, CICRA; 12°34'9" S, 70°6'0.40" W; alt. 270 m; 8–12 Jul. 2010; Silva and M. Viccez leg.; MUSM–ENT 0503472 • 2 ♂♂; Cusco department, Ce Malvinas; Aug. 2013; V. Borda leg.; MUSM–ENT 0515834 • 9 ♂♂; Puno department, Sandia, San Pedro de Putina, Punco, PN Bahuaja-Sonene; 13°20'24.6" S, 69°29'13.9" W; alt. 335 m; 18–19 Sep. 2010; E. Razuri and E. Guillermo leg.; MUSM–ENT 0515835.

Description

Male (holotype, MUSM–ENT 0506888)

COLORATION (Fig. 3A–B, E, G). Carapace orange. Chelicerae, endites, labium, and sternum light orange. Legs light orange. Abdomen: dorsally dark gray, without noticeable pattern (Fig. 3A). Ventrally gray yellowish, darker on epiandric area. Spinnerets beige. Anterior legs without arolium, crista or gladius.

MEASUREMENTS. Total length 3.19; carapace length 1.62; width 1.41; height 0.45. Clypeus height 0.34. Eye diameters and interdistances: PME 0.16; PME–PME 0.37. Chelicerae length 0.56. Sternum length 1.06; width 0.98. Legs: I: 5.48; II: 5.25; III: 4.45; IV: 6.39. Abdomen length 1.60.

GENITALIA. Elongated copulatory bulb, tegulum basal section not swollen and almost as width as apical section (Fig. 4A–B), tegulum surface smooth, embolus surface with longitudinal grooves, embolus tapering to tip, with one long dorsal projection and three ventral projections, one of them with several small dentitions (Fig. 5A–H).

Female (paratype, MUSM–ENT 0506887)

COLORATION AND ABDOMINAL PATTERN. As male but with vivid color tones (Fig. 3C–D, F, H).

MEASUREMENTS. Total length 4.11; carapace length 1.70; width 1.47; height 0.59. Clypeus height 0.26. Eye diameters and interdistances: PME 0.18; PME–PME 0.35. Chelicerae length 0.56. Sternum length 1.08; width 0.99. Legs: I: 5.66; II: 5.29; III: 4.73; IV: 6.66. Abdomen length 2.44.

GENITALIA. External genital area with weakly sclerotized anterior plate, sclerotized lep and remarkable ess, posterior plate narrow (Fig. 4C). Internal genitalia with receptaculum with triangular shape (Fig. 4D).

Variation

Males (n=4): total length: 3.00–3.79; carapace length: 1.43–1.67. Females (n=2): total length: 4.11–4.89; carapace length: 1.66–1.70.

Distribution

Known from several localities in Peru, in the departments of Cusco, Madre de Dios and Puno (Figs 11–12).

Nyetnops madre Villarreal & Martínez sp. nov.

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Figs 6–8, 11–12

Diagnosis

Males of *Nyetnops madre* Villarreal & Martínez sp. nov. resemble those of *N. lachonta* and *N. buruti* by having a copulatory bulb (tegulum+embolus), more than $2.2 \times$ as long as palpal tibia but differ from those of *N. buruti* and *N. lachonta* by having the tegulum basal section of almost the same width as the distal section across the entire length of the bulb (Fig. 7A–B), instead of a distinctly narrower basal section as in *N. buruti* and the narrowing in the anterior section of the tegulum apical section in *N. lachonta*; additionally, the males of this species have an embolar subapical dorsal and ventral serrated keel unique in the genus. Females are similar to those of *N. guarani* by having the posterior plate wide and a triangular distal margin of the receptaculum but can be distinguished by the less sharp dorsal margin of the receptaculum (Fig. 7C–D).

Etymology

The specific epithet is a noun in apposition taken from the type locality Madre de Dios.

Type material

Holotype

PERU • ♂; Madre de Dios department, Boca Río Los Amigos, CICRA; 12°34'9" S, 70°6'0.40" W; alt. 270 m; 9–13 Jun. 2010; H. Silva leg.; MUSM–ENT 0503213.

Paratypes

PERU • 1 ♀; same collection data as for holotype; MUSM–ENT 0503206 • 1 ♂; same collection data as for holotype; MUSM–ENT 0515831 • 2 ♂♂; same collection data as for holotype; MUSM–ENT 0515830 • 1 ♂; same collection data as for holotype; 14 Jun. 2010; M. Vicchez leg.; MUSM–ENT 0503223.

Other material

PERU • 1 ♂; Cusco department, Río Camisea, Pagoreni; 11°42'22.5" S, 72°54'10.7" W; alt. 465 m; 7–28 May 1998; S. Cordova leg.; MUSM–ENT 0506898 • 1 ♂; same collection data as for preceding; 7–29 May 1998; S. Cordova *et al.* leg.; MUSM–ENT 0515832.

Description

Male (holotype, MUSM–ENT 0503213)

COLORATION (Fig. 6A–B, E, G). Carapace orange. Chelicerae, endites, labium, and sternum light orange. Legs light orange. Abdomen: dorsally dark gray, without noticeable pattern (Fig. 6A). Ventrally gray yellowish, darker on epiandric area. Spinnerets beige. Anterior legs without arolium, crista or gladius.

MEASUREMENTS. Total length 3.51; carapace length 1.54; width 1.30; height 0.68. Clypeus height 0.31. Eye diameters and interdistances: PME 0.17; PME–PME 0.39. Chelicerae length 0.47. Sternum length 0.98; width 0.85. Legs: I: 5.21; II: 4.70; III: 4.29; IV: 6.37. Abdomen length 1.95.

GENITALIA. Very elongated copulatory bulb, tegulum basal section slightly swollen and almost as width as apical section, tegulum surface smooth, embolus surface with sparse longitudinal grooves, embolus



Fig. 6. *Nyetnops madre* Villarreal & Martínez sp. nov. **A–B, E, G.** ♂, holotype (MUSM–ENT 0503213). **C–D, F, H.** ♀, paratype (MUSM–ENT 0503206). **A–B.** Habitus, dorsal view. **C–D.** Habitus, ventral view. **E–F.** Prosoma, dorsal view. **G–H.** Prosoma, ventral view. Scale bars = 1 mm.

with dorsal and ventral dentated keel and tip with very long projections, dorsally petal-like and ventrally rooster-like (Figs 7A–B, 8A–F).

Female (paratype, MUSM–ENT 0503206)

COLORATION AND ABDOMINAL PATTERN. As male, but with lighter color tones (Fig. 6C–D, F, H).

MEASUREMENTS. Total length 5.08, carapace length 1.65, width 1.50, height 0.44. Clypeus height 0.33. Eye diameters and interdistances: PME 0.16, PME–PME 0.38. Chelicerae length 0.51. Sternum length 1.16, width 1.05. Legs: I: 6.20; II: 5.76; III: 5.37; IV: 7.55. Abdomen length 3.24.

GENITALIA. External genital area with weakly sclerotized anterior plate, lep and ess, posterior plate narrow (Fig. 7C). Internal genitalia with triangular margin of receptaculum, posterior plate well developed (Fig. 7D).

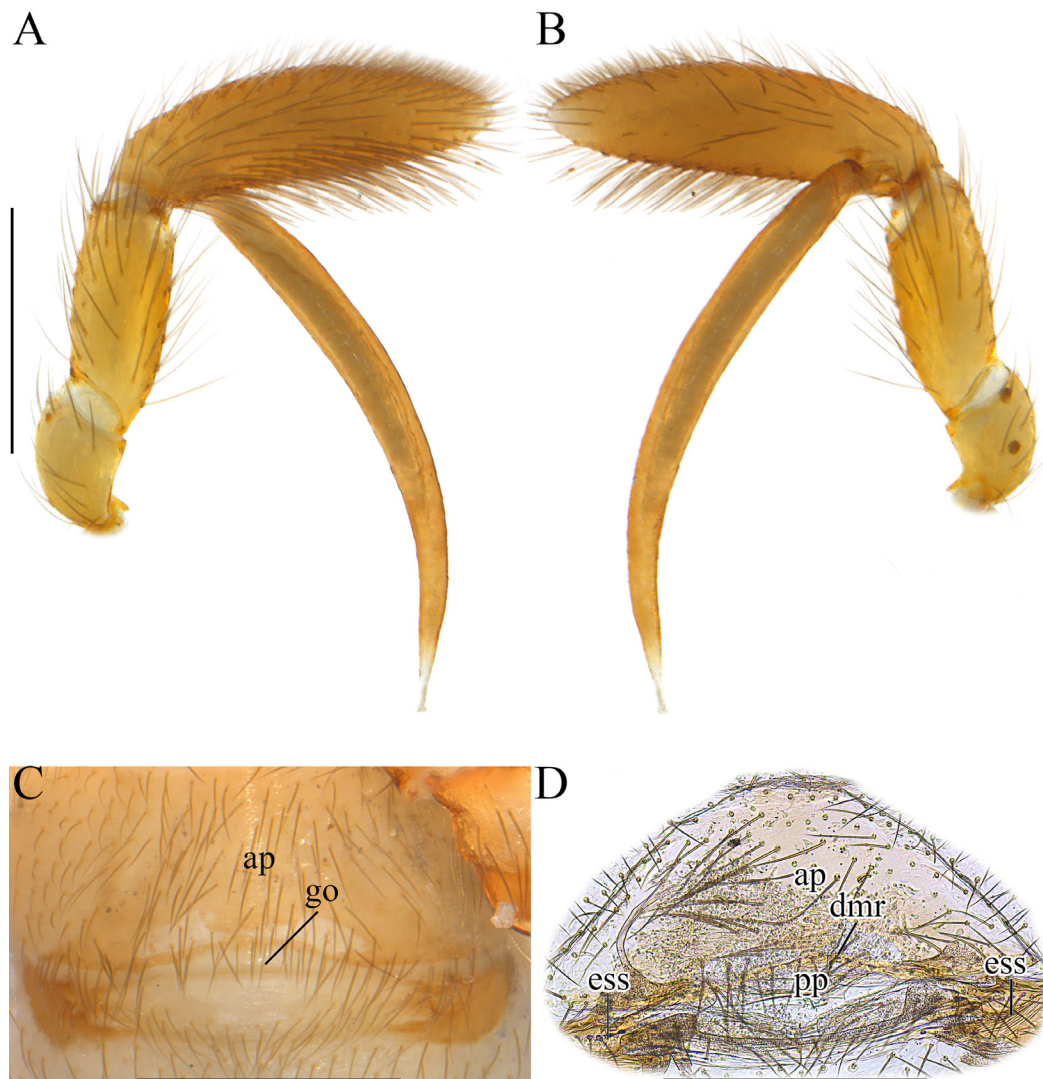


Fig. 7. *Nyetnops madre* Villarreal & Martínez sp. nov. **A–B.** ♂, holotype (MUSM–ENT 0503213). **C–D.** ♀, paratype (MUSM–ENT 0503206). **A.** Left palp, prolateral view. **B.** Left palp, retrolateral view. **C.** External genitalia, ventral view. **D.** Internal genitalia, dorsal view. Scale bars = 0.5 mm.

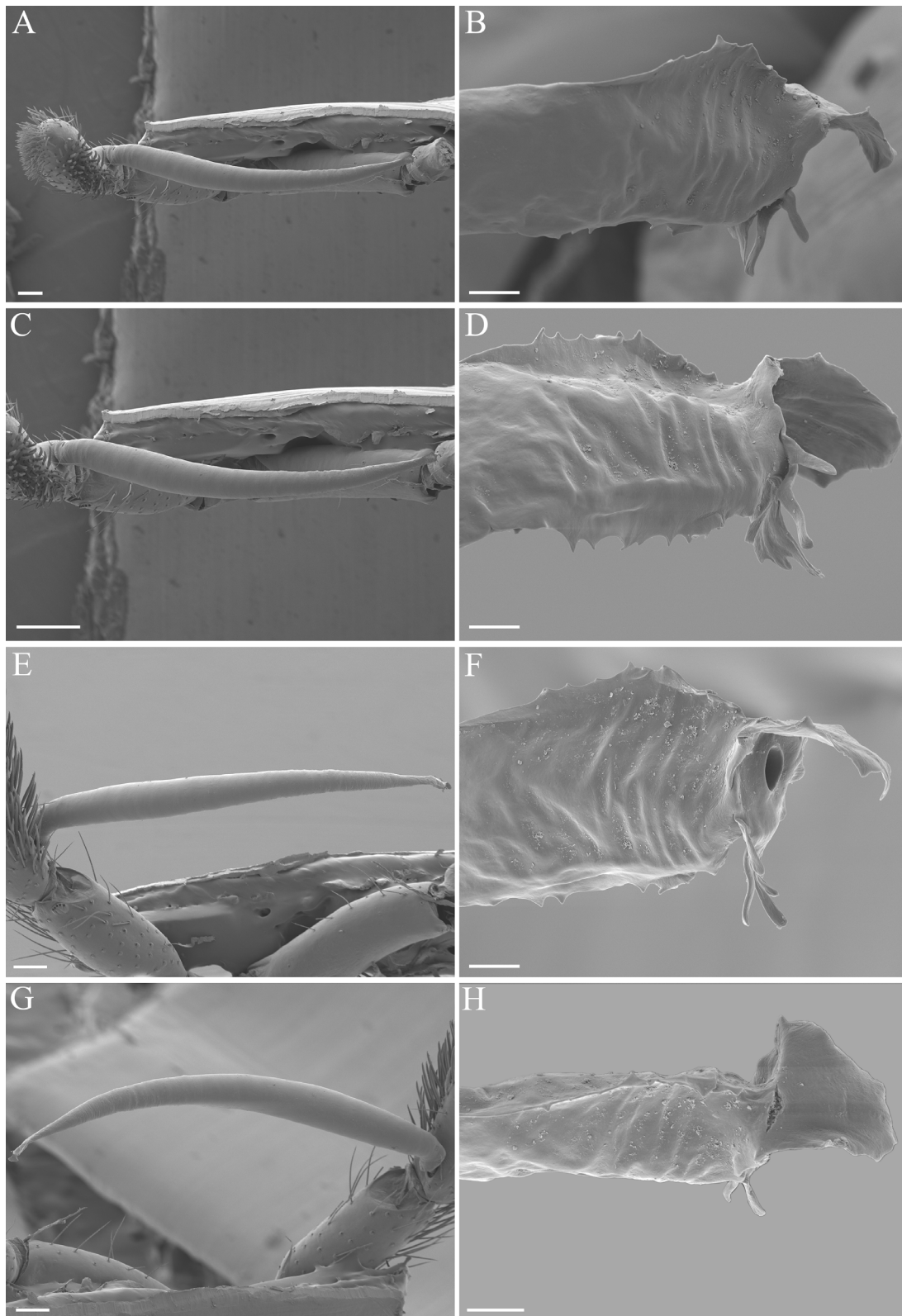


Fig. 8. *Nyetnops madre* Villarreal & Martínez sp. nov., ♂, paratype (MUSM-ENT 0515830). **A, C.** Left palp, dorsal view. **B, F.** Tip of the embolus, prolateral view. **D.** Tip of the embolus, proventral view. **E.** Copulatory bulb, prolateral view. **G.** Copulatory bulb, retrolateral view. **H.** Tip of the embolus, dorsal view. Scale bars: A, C, E, G=0.1, mm; B, D, F, H=0.01 mm.

Variation

Males (n=3): total length: 3.51–3.96; carapace length: 1.49–1.83.

Distribution

Widespread distribution is known from one locality in Madre de Dios and Cusco departments each (Figs 11–12).

Nyetnops josei Villarreal & Martínez sp. nov.

[urn:lsid:zoobank.org:act:F3EA2820-CB46-4BF5-825C-FF09ED76BB50](https://zoobank.org/urn:lsid:zoobank.org:act:F3EA2820-CB46-4BF5-825C-FF09ED76BB50)

Figs 9–12

Diagnosis

The male of *Nyetnops josei* Villarreal & Martínez sp. nov. resembles those of *N. guarani*, *N. naylianae* and *Nyetnops alexanderi* Villarreal & Martínez sp. nov. by having a copulatory bulb (tegulum + embolus), less than $2.2 \times$ as long as palpal tibia but differ from them by having a remarkable dorsal abdominal pattern with chevron stripes.

Etymology

The specific epithet is a patronym in honor of Jose Ochoa for his contributions to the knowledge of the arachnids, mainly scorpions in the new world.

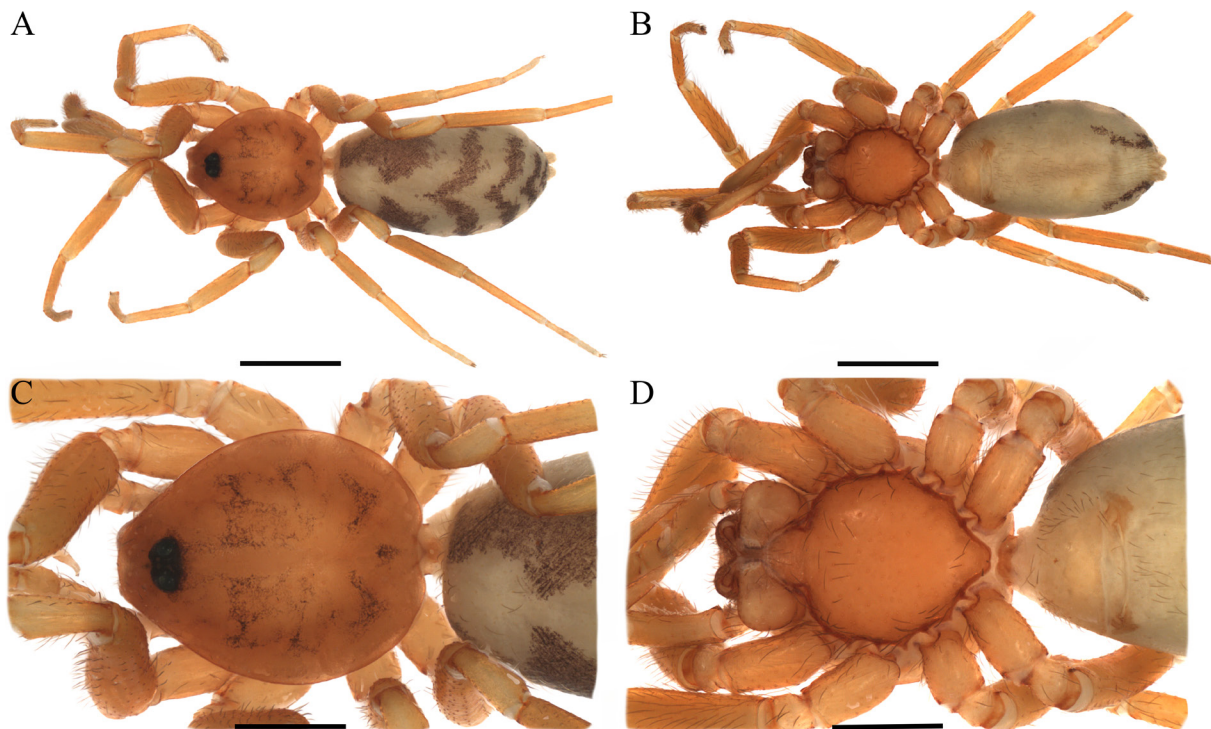


Fig. 9. *Nyetnops josei* Villarreal & Martínez sp. nov., ♂, holotype (MUSM–ENT 0515886). **A.** Habitus, dorsal view. **B.** Habitus, ventral view. **C.** Prosoma, dorsal view. **D.** Prosoma, ventral view. Scale bars: A–B=1 mm; C–D=0.5 mm.

Type material

Holotype

PERU • ♂; Cusco department, Oropesa, Tipón; 12 Sep. 1993; MUSM–ENT 0515886.

Description

Male (holotype, MUSM–ENT 0515886)

COLORATION (Fig. 9A–D). Carapace light orange. Chelicerae, endites, labium, and sternum light orange. Legs light orange. Abdomen: dorsally gray, with a dark pattern composed by chevron stripes (Fig. 9A). Ventrally gray yellowish, darker on epiandric area. Spinnerets beige. Anterior legs without arolium, crista or gladius.

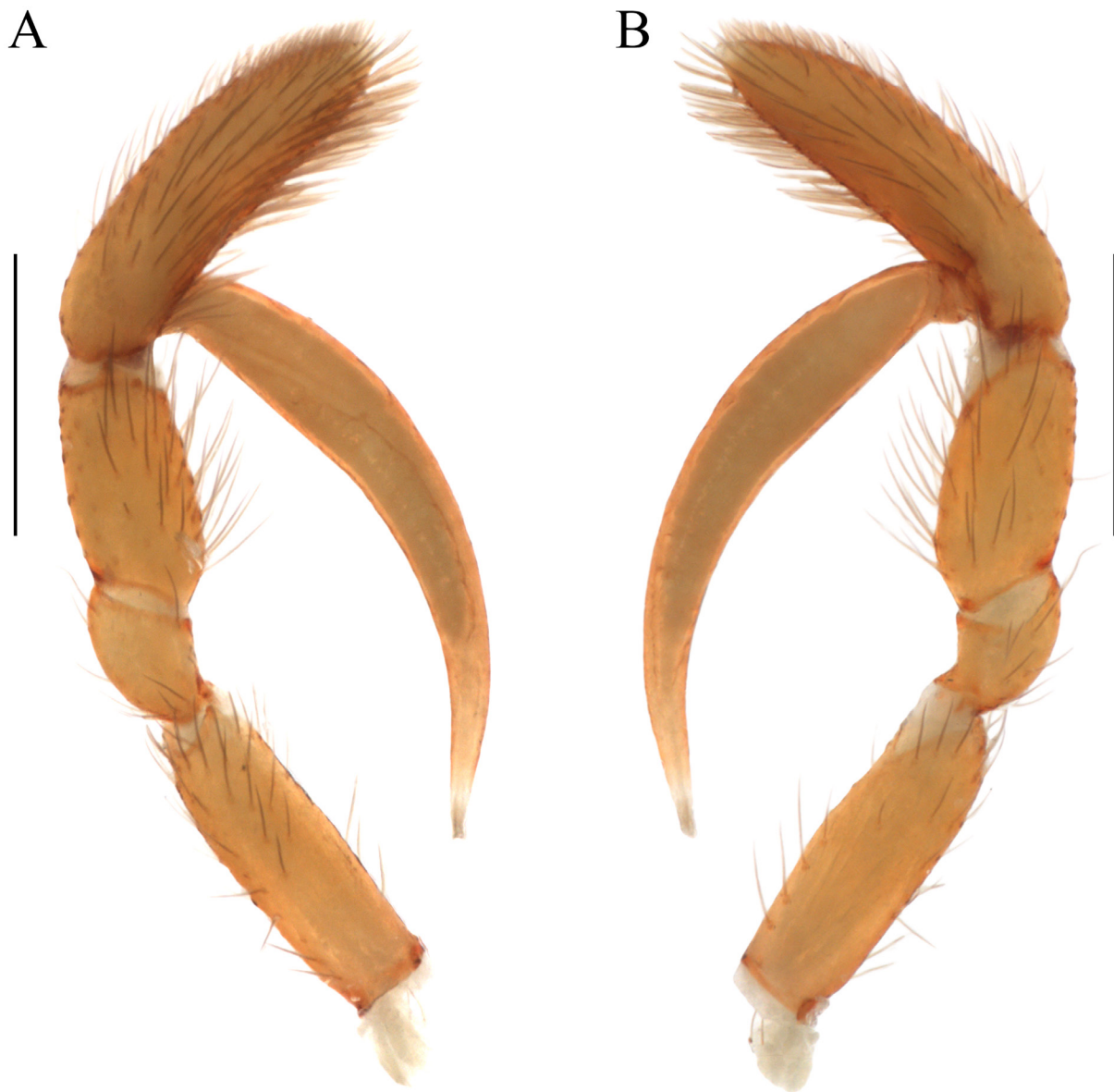


Fig. 10. *Nyetnops josei* Villarreal & Martínez sp. nov., ♂, holotype (MUSM–ENT 0515886). **A.** Left palp, prolateral view. **B.** Left palp, retrolateral view. Scale bars=0.5 mm.

MEASUREMENTS. Total length 3.83; carapace length 1.43; width 1.20; height 0.53. Clypeus height 0.24. Eye diameters and interdistances: PME 0.08; PME–PME 0.24. Chelicerae length 0.38. Sternum length 0.91; width 0.85. Legs: I: 3.98; II: 3.66; III: 3.21; IV: 4.48. Abdomen length 2.27.

GENITALIA. Elongated copulatory bulb 2 × as long as palpal tibia; tegulum basal section only slightly swollen and almost as wide as apical section, embolus tip weakly sclerotized (Fig. 10A–B).

Female

Unknown.

Distribution

Only known from the type locality in Cusco department (Figs 11–12).

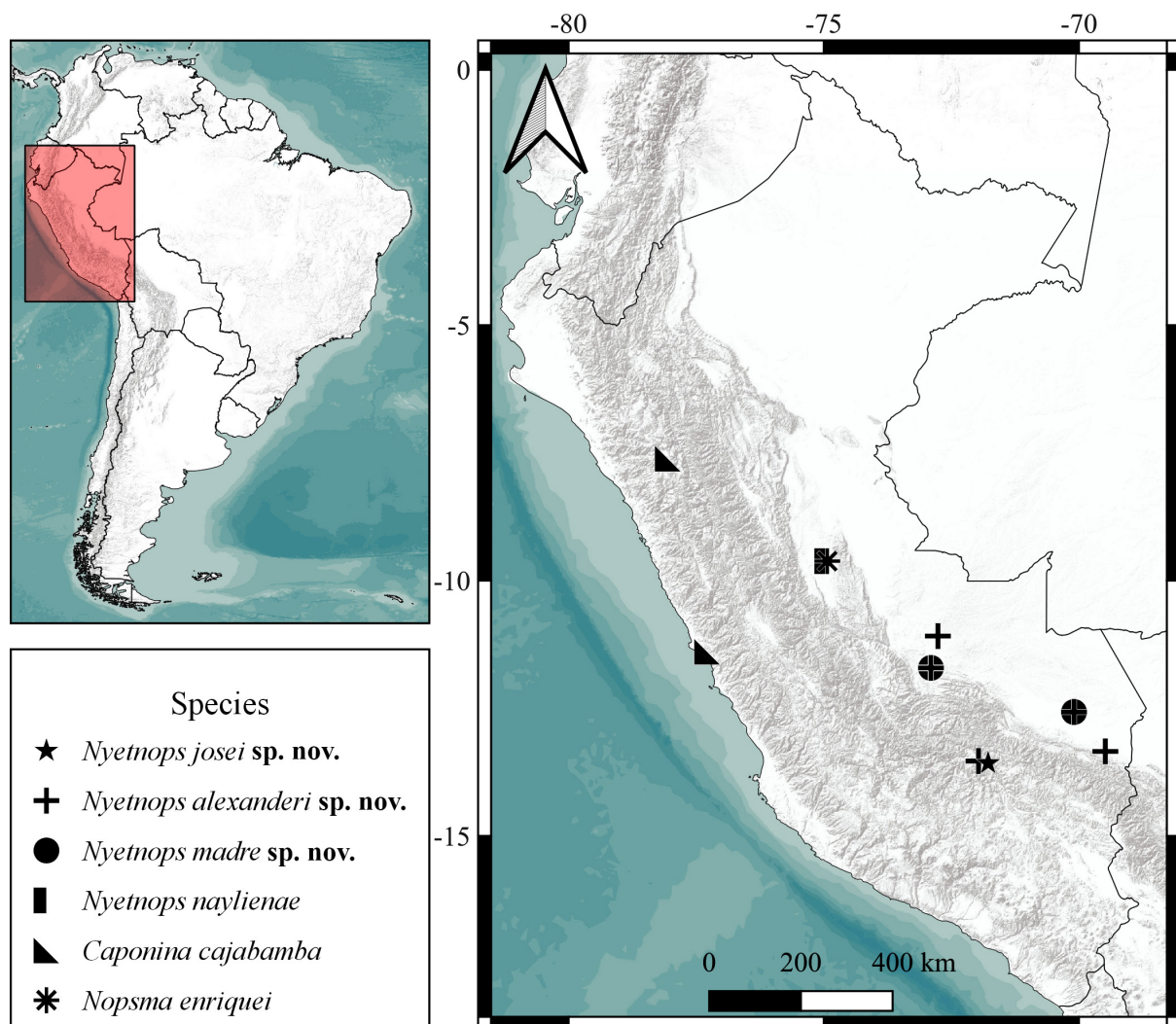


Fig. 11. Distribution map of species of Caponiidae Simon, 1890 recorded from Peru.

Key to the males of *Nyetnops* Platnick & Lise, 2007 updated from Sánchez-Ruiz *et al.* (2020)

1. Without remarkable dorsal abdominal pattern (Sánchez-Ruiz *et al.* 2020: figs 1a, g, 4a, g) 2
 - With remarkable dorsal abdominal pattern of chevron stripes (Fig. 9A) *Nyetnops josei* Villarreal & Martínez sp. nov.
2. Length of copulatory bulb (tegulum+embolus) just two times or less the palpal tibia length (Fig. 4A–B Sánchez-Ruiz *et al.* 2020: figs 1b–d, 4b–c) 3
 - Length of copulatory bulb (tegulum+embolus) more than 2.2 × as long as palpal tibia (Sánchez-Ruiz *et al.* 2020: figs 8b–c; 9b–c) 5
3. Tegulum apical section not swollen on median portion, same width as tegulum basal section (Figs 4A–B, 5A, G) *N. alexanderi* Villarreal & Martínez sp. nov.
 - Tegulum apical section swollen on median portion (Sánchez-Ruiz *et al.* 2020: fig. 7a–f) 4
4. Tegulum apical section swollen on median portion, width similar to palpal tibia (Sánchez-Ruiz *et al.* 2020: figs 4b–c, 8h), embolus tip with very long rooster’s crest like projections (Sánchez-Ruiz *et al.* 2020: fig. 7a–f) *N. naylieniae* Sánchez-Ruiz, Brescovit & Bonaldo, 2020
 - Tegulum apical section weakly swollen on median portion, narrower than palpal tibia width (Sánchez-Ruiz *et al.* 2020: fig. 1b–c), embolus tip beveled with short projections (Sánchez-Ruiz *et al.* 2020: fig. 3g–i) *N. guarani* Platnick & Lise, 2007

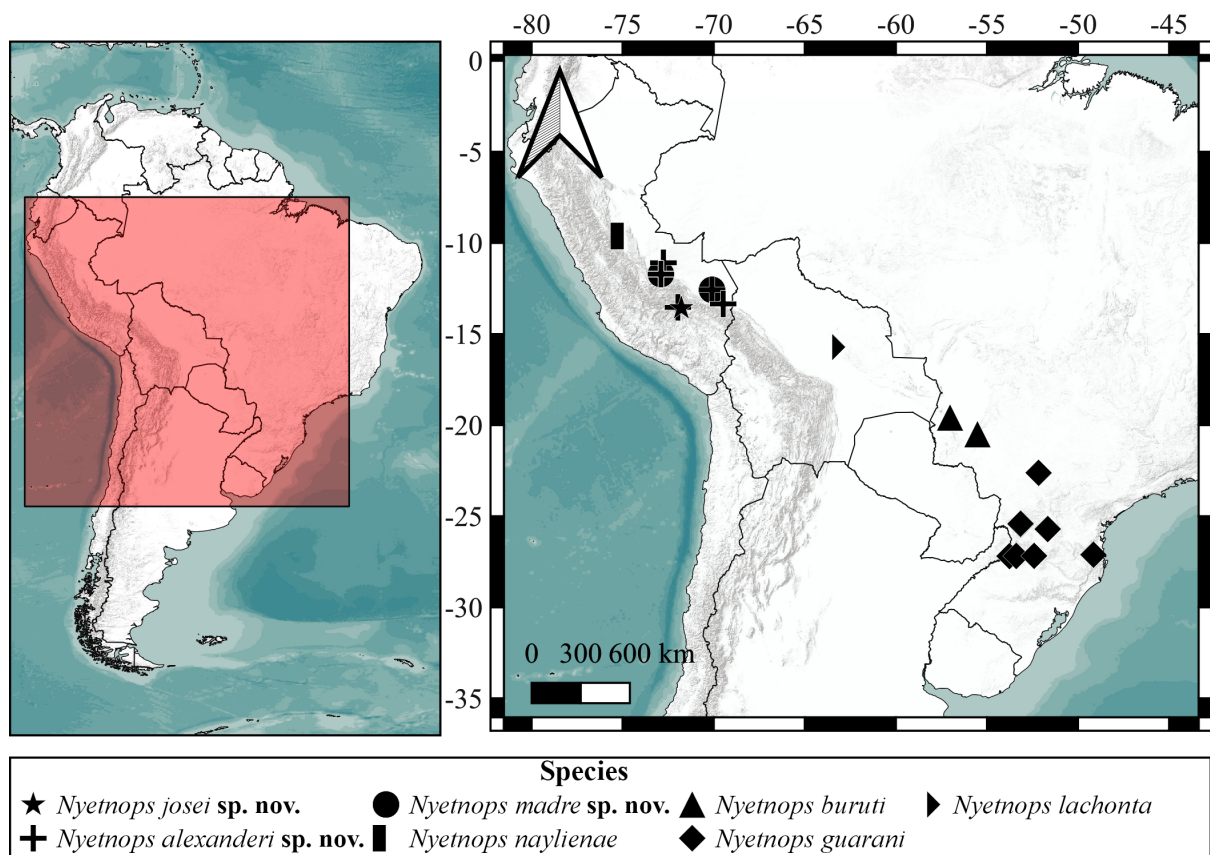


Fig. 12. Distribution map of the genus *Nyetnops* Platnick & Lise, 2007.

5. Mid of palpal tibia strongly swollen, $1.8 \times$ as wide as proximal and distal portions (Sánchez-Ruiz *et al.* 2020: fig. 8b–c); copulatory bulb slender, weakly swollen on tegulum apical section, only a half palpal tibia width (Sánchez-Ruiz *et al.* 2020: fig. 8b–c)
.....*N. lachonta* Sánchez-Ruiz, Brescovit & Bonaldo, 2020
- Mid of palpal tibia weakly swollen, only $1.2 \times$ as wide as proximal and distal portions (Fig. 6A–B; Sánchez-Ruiz *et al.* 2020: fig. 9b–c) 6
6. Copulatory bulb thick, slightly swollen at tegulum apical section and narrow at basal section (Sánchez-Ruiz *et al.* 2020: figs 8i, 9b–c)*N. buruti* Sánchez-Ruiz, Brescovit & Bonaldo, 2020
- Copulatory bulb very slender, not swollen at tegulum apical section and slightly swollen at basal section (Fig. 6A–B)*Nyetnops madre* Villarreal & Martínez sp. nov.

Discussion

The knowledge on the diversity of the Peruvian Caponiidae is increased with the new data included in this work. The current checklist of Caponiidae is represented by seven species, with *Nyetnops* being the most diverse group with four species recorded. Currently, the distribution of species of *Nyetnops* is restricted to the southern part of South America, from Peru to Brazil. With respect to the altitude, the majority of the species, such as *N. guarani*, *N. lachonta*, *N. buruti* and *N. naylieniae*, are known from lowlands. Meanwhile, the new species *Nyetnops alexanderi* Villarreal & Martínez sp. nov. and *Nyetnops madre* Villarreal & Martínez sp. nov. were mainly collected in zones with altitudes between 270 and 560 meters. However, for the first time, we register species in high altitude zones, such as *Nyetnops josei* Villarreal & Martínez sp. nov. (above 3000 m) distributed in the Andean zones of Cusco.

The somatic morphology of the genus is very conservative, some differences could be discerned in the dorsal carapace pattern which can be marked as in *N. guarani*, *N. alexanderi* Villarreal & Martínez sp. nov. and *N. madre* Villarreal & Martínez sp. nov. or faint as in *N. naylieniae* and *N. buruti*. In the abdomen dorsally, the only species with a notable pattern is *N. josei* Villarreal & Martínez sp. nov.

In the male genital morphology, the differences are easily identified, mainly the conformation of the tegulum and the length of the tegulum plus embolus. All the previously known species have differences between the basal and the apical section of the tegulum, being swollen or narrow, although the new species described herein, *N. alexanderi* Villarreal & Martínez sp. nov. and *N. madre* Villarreal & Martínez sp. nov., show slight differences between these two sections of the tegulum: in *N. madre* the tegulum basal section is slightly swollen in the first posterior third and in *N. alexanderi* the difference is also almost unnoticeable.

In females the differences are given by the shape of the posterior plate, which is narrow in *N. naylieniae* and *N. alexanderi* Villarreal & Martínez sp. nov. and wide in *N. guarani* and *N. madre* Villarreal & Martínez sp. nov. The receptaculum also varies in shape being triangular in *N. naylieniae*, *N. madre* and *N. alexanderi* or with a concavity and two lobes on both lateral sides in *N. naylieniae*.

Acknowledgments

We are grateful to Diana Silva (Museo de Historia Natural de la Universidad Mayor de San Marcos) who kindly allowed and facilitated the revision of the material referenced herein. We also thank Arli Ayala for their assistance in photographing the specimens. We wish to thank Museo Argentino de Ciencias Naturales Bernardino Rivadavia for helping with SEMs. Thanks to Cristian Casas for their comments on the manuscript. Finally, we thank MinCiencias for their support through the “Convocatoria para el Fortalecimiento de las Instituciones de Educación Superior” (Convocatoria 890) and the Universidad del Atlántico for their support through the “Convocatoria para el fortalecimiento de grupos de Investigación”.

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Manuscript received: 11 November 2023

Manuscript accepted: 26 February 2024

Published on: 6 May 2024

Topic editor: Magalie Castelin

Section editor: Arnaud Henrard

Desk editor: Eva-Maria Levermann

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