

HISTORIA NATURAL

Tercera Serie | Volumen 11 (2) | 2021/141-149

A NEW SPECIES OF *Pachomius* PECKHAM & PECKHAM (ARANEAE: SALTICIDAE), INHABITING A RIVER-BANK OF NORTHERN ARGENTINA

*Una nueva especie de Pachomius Peckham & Peckham (Araneae: Salticidae), habitante de un
banco de río del Norte de Argentina*

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Abstract. According to their nature, riparian environments are represented in reduced areas; they are vulnerable to water downspouts and dams. This paper describes and illustrates a new species of jumping spider, *Pachomius palustris* sp. nov., an inhabitant of the riparian vegetation from the Paraná River banks, in the Argentinian side. The new species was placed into the *dybowski* group because the female has the posterior edge of epigynal copulatory openings extended and the male lacks the lateral subterminal apophysis. *Pachomius palustris* sp. nov. is distinguished from other species of this group by having a thinner and longer embolus with a slightly curved tip and copulatory openings with semi-spiral edges. A hypothesis about its probable reduced distribution is also discussed.

Key words. Neotropical Freyina, *Pachomius*, salticid, taxonomy.

Resumen. De acuerdo con su naturaleza, los ambientes riparios están representados en áreas reducidas; son vulnerables a las bajantes de agua y a las represas. Este documento describe e ilustra una nueva especie de araña saltarina, *Pachomius palustris* sp. nov., habitante de las plantas palustres sobre bancos del Río Paraná en el lado argentino. La nueva especie fue ubicada dentro del grupo *dybowski* porque la hembra tiene el borde posterior de las aberturas copulatorias del epigino extendidas y el macho carece de apófisis subterminal lateral. *Pachomius palustris* sp. nov. se distingue de otras especies del grupo por tener un émbolo más fino y largo con la punta ligeramente curvada y las aberturas copulatorias con los bordes semi espiralados. También se discute una hipótesis sobre su probable distribución reducida.

Palabras clave. Freyina neotropical, *Pachomius*, saltícido, taxonomía.

INTRODUCTION

The Neotropical genus *Pachomius* Peckham & Peckham, 1896 falls within the subtribe Freyina (Edwards, 2015) and contains 23 nominal species (WSC, 2021), making it the second most diverse genus in its subtribe (after *Phiale* C.L. Koch, 1846). *Pachomius* is primarily recognized by a distinctive femoral organ found distally on the prolateral side of the palpal femur of males, and a median thoracic stripe on the carapace (Edwards, 2015).

So far, only four species of *Pachomius* have been cited from Argentina. However, this number does not reflect the true diversity of species of this genus present in the country. At least in the Misiones province, in addition to *P. misionensis* (Galiano, 1995), *P. ministerialis* (C.L. Koch, 1846), *P. rubrogastrus* Pett, Rubio & Stolar, 2021 and *P. areteguazu* Rubio, Stolar & Baigorria, 2021, some undescribed species were found recently and one of them is also distributed in the grasslands of Paraguay. Specimen sampling in Misiones province seems to be concentrated in the northern region, at the Paraná Atlantic Forest ecoregion, and in few protected areas like the Iguazú National Park, while the southern region of the savannahs where most *Pachomius* live more poorly known (Rubio, 2014; Rubio, 2016; Rubio *et al.*, 2018a, b).

The Southern Cone Mesopotamian Savanna ecoregion is a grassland-wetland environment, covering a small area of northeastern Argentina, from southern Misiones province and through eastern Corrientes province (Olson *et al.*, 2001). The landscape is mainly dominated by tall grasses like *Andropogon* spp., *Paspalum* spp. and *Sorghastrum* spp., with scattered dry forest patches, and gallery forests. This ecoregion is a biodiversity and endemism hotspot, especially in southern Misiones forming an ecotone of riparian ecosystems

floristically and structurally diverse (Zanotti *et al.*, 2020). In the present paper, we described a new species of *Pachomius*, inhabitant of the riparian environments of the Mesopotamian savanna of Misiones.

MATERIAL AND METHODS

For the taxonomic description of the new species morphological terms, abbreviations, definitions, and some measurements follow recent studies on freyine salticids (Edwards, 2015; Rubio *et al.*, 2019). Female genitalia were dissected as described by Levi (1965), examined after digestion in hot ~15% NaOH solution, and cleared in clove oil to examine their internal structure. Temporary preparations were observed and photographed using a Leica DM500 compound microscope and a Leica M60 stereomicroscope. Structures were sketched from incident light photograph models using a computer system for drawing and image processing (Wacom digitizer tablet with GIMP, free software). Measurements were taken directly from a microscope ocular lens with an ocular micrometer and are expressed in millimeters. Photographs of live spiders were taken using a Nikon D3200 digital camera with a Raynox 250 lens. Photos of figures 20 and 21 were taken with a pocket camera.

Acronyms. CD, copulatory duct; CO, copulatory opening; FD, fertilization duct; LSA, lateral subterminal apophysis; PME, posterior median eyes; PLE, posterior lateral eyes; pRL, proximal retrolateral lobe of TDD; RTA, retrolateral tibial apophysis; TBD, tegulum basal division; TDD, tegulum distal division. The arachnological collection was abbreviated as follows (curator in parenthesis): IBSI-Ara, Instituto de Biología Subtropical, Misiones, Argentina (G. Rubio).

RESULTS

Systematics

Family SALTICIDAE Blackwall, 1841

Subfamily SALTICINAE Blackwall, 1841

Tribe AELURILLINI Simon, 1901

Subtribe FREYINA Edwards, 2015

Genus *Pachomius* Peckham & Peckham, 1896

Pachomius palustris sp. nov.

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Figures 1-2

Type material. Male holotype (IBSI-Ara 1524) and female allotype (IBSI-Ara 1525) from Argentina, Misiones, Candelaria, Santa Cecilia Ranch (-27.45046° S; -55.71637° W), 15 September 2020, Baigorria J.E. coll. Paratypes: 1 female (IBSI-Ara 1526), 1 male (IBSI-Ara 1527) and 1 male (IBSI-Ara 1528) same data as holotype; 1 male (IBSI-Ara 1546) and 1 female (IBSI-Ara 1547) from Misiones, Candelaria, Urutaú Nature Reserve (-27.48024° S; -55.79254° W), 5 February 2021, Rubio G.D., Baigorria J.E. & Stolar C.E. coll.

Etymology. The specific epithet, *palustris*, refers to a Latin word that means “from the swamps” or “from the marshes” and indicates its common habitat.

Note. *Pachomius palustris* sp. nov. is placed in the *dybowskii* group (Edwards, 2015) by having the posterior edge of epigynal COs extended, more heavily pigmented than other groups; the male LSA absent or reduced as a short projection, and the abdominal light body markings (lateral and median) arranged longitudinally. The *dybowskii* group is completed with the following species (*sensu* Edwards, 2015): *P. bilobatus* (F.O.P.-Cambridge, 1901), *P. dybowskii* (Taczanowski, 1871), *P. hadzji*

(Caporiacco, 1955), *P. hieroglyphicus* (F.O.P.-Cambridge, 1901), *P. peckhamorum* Galiano, 1994, *P. sextus* Galiano, 1994 and *P. villeta* Galiano, 1994.

Diagnosis. Male of *P. palustris* sp. nov. is distinguished from the other species of the group by having a thinner and longer embolus (from *P. dybowskii* and *P. hadzji*), with a slightly curved tip (from all the group) and absence of the LSA projection (from *P. peckhamorum*, *P. sextus*, and *P. villeta*) (Figure 1, B-D). Female of *P. palustris* sp. nov. differs from all other females described in the *dybowskii* group by having circular CO with slightly spiral edges, straight CD and rounded spermathecae (Figure 1, F-G).

Description. Male (holotype) illustrated in Figure 1 (A-D; H-I), and Figure 2 (A, and G). Total length: 5.50. Carapace slightly longer than wide, length: 2.90; width: 2.15. Carapace dark brown, cephalic region blackish with three conspicuous spots of white setae, two between the PME and PLE, and one between PLE; two small pale spots of blackish scales behind and under the PLE. Wide yellowish marginal bands continued from the clypeus. Clypeus covered with numerous long white hairs (Figure 1, I). Chelicerae stout, paturon dark brown (Figure 1, I), with two smooth promarginal teeth and one retromarginal tooth. Sternum dark brown, with abundant white translucent hairs. The first pair of legs slightly stouter than the rest, left leg I recently regenerated. Legs hairy, dark brown (black in life), ringed with white, coxae pale. Abdomen length: 2.85, width: 1.80, color in alcohol reddish-brown (Figure 1, H), intense red in life (Figure 2, A); with a large abdominal basal band of white hairs on the anterior edge of the abdomen and two pairs of three white spots bordered in black aligned transversely, which

are indeed the longitudinal light body markings (two lateral and the median) mentioned by Edwards (2015). Dorsal scutum absent. Palp: femur slightly curved, with femoral organ distally half found on the prolateral side (Figure 1, B), tibia with a conspicuous RTA with a wide base, narrower towards the apex, triangular-shaped, directed apically (Figure 1, C). Division of the tegulum inconspicuous, with the border between TBD and TDD oblique in ventral view. TDD with pRL

wide and sinuous edges. Embolus thick, sclerotized with conspicuous base, and slightly bent at the tip, retrolaterally directed tip. TBD with a short and curved visible section of the spermophore (Figure 1, D). Female (allotype) illustrated in Figure 1 (E-G). Total length: 6.80. Carapace slightly longer than wide, length: 2.75, width: 2.00. Carapace dark mahogany brown, cephalic region darker with some scattered white and reddish hairs. Wide yellowish marginal bands continued from the clypeus, less

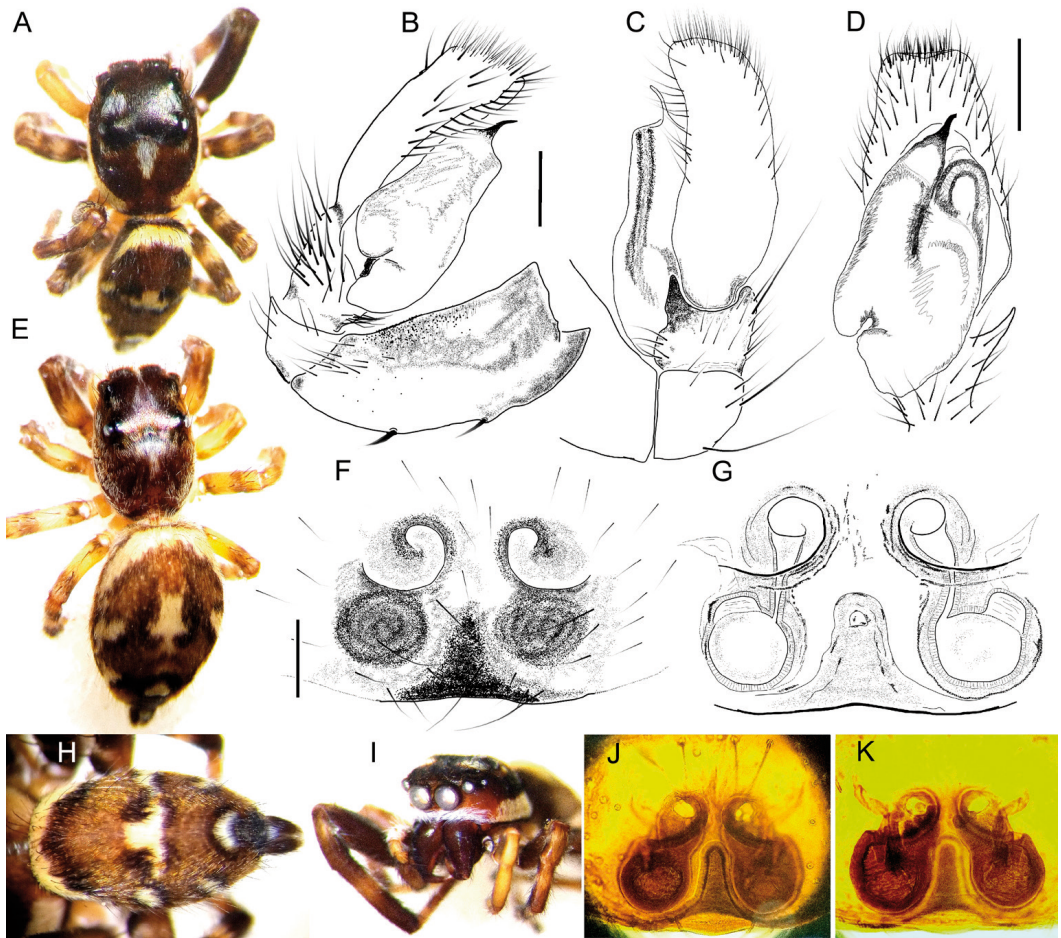


Figure 1 - Preserved specimens of *Pachomius palustris* sp. nov. **A**, dorsal habitus of male; **B-D**, palp in prolateral (B), retrolateral (C) and ventral (D) views; **E**, dorsal habitus of female; **F**, epigyne in ventral view; **G**, same, cleared; **H**, detail of abdominal pattern; **I**, frontal/lateral view of male; **J**, epigyne cleared ventral view; **K**, same, dorsal view. Holotype (**A-D**, **H-I**); allotype (**E-G**). Scale bar 0.2 mm (**B, D**), 0.1 mm (**F**).

dense than in the male. Clypeus covered with many long white hairs. Chelicerae as in male, a little less stout, paturon dark mahogany, with two smoothed promarginal teeth and one retromarginal tooth. Sternum as in male. Legs equal, brown with paler coxae, in living specimen the legs covered with conspicuous white setae. Abdomen length: 4.20, width: 2.70, hairy, color in alcohol reddish-brown, with a large white abdominal basal band on the anterior edge of the abdomen and two pairs of three white spots bordered in black aligned transversely (as in male). Epigyne: small epigynal plate, wider than

longer (length: 0.45, width: 0.50), with two anterolateral circular CO with slightly spiral edges (Figure 1, F); CD with a funnel-shaped anterior stretch, connecting anteriorly to a spherical spermatheca; FD anterior to spermatheca (Figure 1, G). Epigyne from another specimen in Figure 1 (J-K).

Variability. Males (n = 4): Total length 4.00–5.50. Carapace length 2.15–2.90, width 1.60–2.15. Abdomen length 1.80–2.85, width 1.35–1.80. One male does not have the white median thoracic stripe on the carapace. Females (n = 3): Total length



Figure 2 - Habitus in nature of *Pachomius palustris* sp. nov. from Santa Cecilia Ranch in Candelaria, Misiones. Male specimens (A-D, G), female (E-F, H) and an immature specimen feeding on a mayfly (I-J). Figures A and G are the holotype.

5.90–7.15. Carapace length 2.70–2.80, width 1.90–2.00. Abdomen length 3.30–4.40, width 2.20–3.05. Epigynal plate length 0.42–0.45, width 0.47–0.50. The ringed pattern of the legs varies being more conspicuous in some females. Immature specimens have the same coloration pattern as adults but are paler (Figures 2, I-J).

Natural history. *Pachomius palustris* sp. nov. inhabits the ecoregion Southern Cone Mesopotamian Savanna, but it seems to be extremely adapted to riparian environments, since we have only collected this species on vegetation at the river banks (Figures 3,C-D). We observed many of these spiders feeding on mayflies (Ephemeroptera) which might be an important item in their diet (Figure 2, I-J). Based on the authors' field observation

adult spiders are from September to July (Figure 2, A-H).

Distribution. Only known from northeastern Argentina, in Candelaria, Misiones (Figure 3, A-B).

Remarks. The lack of *Pachomius palustris* sp. nov. in nearby fairly sampled areas like the Iberá wetlands, southern Paraná river in Corrientes or Chaco provinces or the Iguazú river (Avalos *et al.*, 2007; Rubio, 2014; Rubio, 2016; Rubio *et al.*, 2018a, b) may suggest that this species is either an endemism from southern Misiones, or is related to the Paraguay River Basin. Several endemic plants and small vertebrates were discovered in the Southern Cone Mesopotamian Savanna ecoregion from southern Misiones province, e.g.: Zanotti *et*

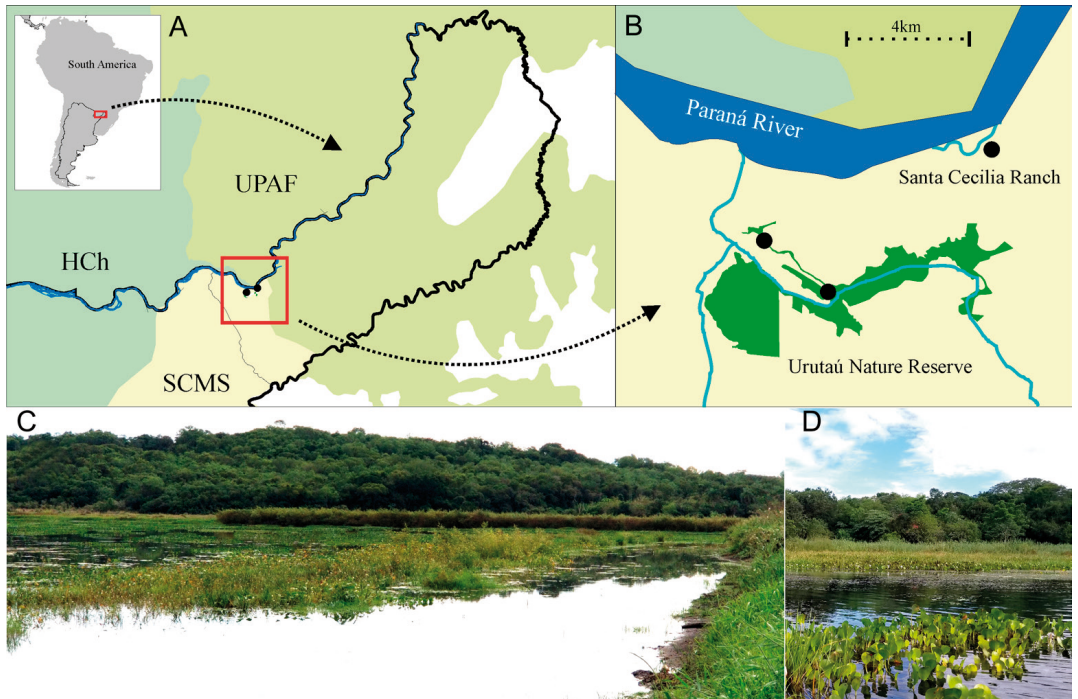


Figure 3 - Map of *Pachomius palustris* sp. nov. specimen records, black dots (A-B) and environment where this species inhabits in the type locality, Santa Cecilia Ranch, Candelaria (C-D). Extent of the ecoregions (HCh: Humid Chaco; UPAF: Upper Parana Atlantic Forest; SCMS: Southern Cone Mesopotamian Savanna) from Olson *et al.* (2001).

al. (2020) state that 66% of endemic plant taxa from Misiones, a total of 31, grow in the Mesopotamian savanna and none of them are found in a protected area of the province. Of the endemic taxa, seven grow within a 20 km radius from our sampling locations at Santa Cecilia Ranch. After one year of sampling within this ecoregion, we have found a large proportion of undescribed and unique genera and species, like the one described in this manuscript. Other examples of endemism in the Southern Cone Mesopotamian Savanna are the bufonid toad *Melanophryniscus krauczuki* Baldo & Basso, 2004, the frog *Scinax fontanarrosai* Baldo *et al.*, 2019, and the grass mouse *Akodon philipmyersi* Pardiñas, D'Elía, Cirignoli & Suárez, 2005 (Baldo and Basso, 2004; Pardiñas *et al.*, 2005; Baldo *et al.*, 2019).

It is necessary to include riparian and grasslands ecosystems in operative and policy formulations that answer to local and regional conditions for the conservation of biodiversity and water quality (Naiman *et al.*, 2000), and to work along with stakeholders and ranchers to ensure the conservation of these unique habitats.

ACKNOWLEDGMENTS

We wish to especially thank the three reviewers Glavis B. Edwards, William Galvis and Gastón Zubarán for the improvements to the original manuscript. Many thanks are also extended to Temaikèn Foundation for proposing, facilitating and financing this work, especially to Jerónimo Torresin for the support and efforts and to ranger Gabriel Ruiz Diaz for his assistance and logistics in Urutaú Nature Reserve; to Carlos Navajas for his help in Santa Cecilia Ranch. We also thank Ernesto Krauczuk and Diego Baldo for providing helpful information about endemic plants and animals. The samplings were possible with

the permits of the Instituto Misionero de Biodiversidad (IMiBio) and the Entidad Binacional Yacyretá (EBY). This publication was supported by funds from the Temaikèn Foundation given to the authors.

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Recibido: 29/04/2021 - Aceptado: 31/05/2021 - Publicado: 30/07/2021