



Research article

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A glimpse into the diversity of *Stygnus* Perty, 1833: A new Colombian species and additional records from South America (Opiliones, Stygnidae)

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Abstract. A taxonomic revision of *Stygnus* Perty, 1833, in Colombia was conducted. The new species *Stygnus apaporis* sp. nov. is described from Lago Taraira, departments of Guaviare and Vaupés in the Colombian Amazonian region. The genus is recorded for the first time in eight Colombian departments: Amazonas, Caquetá, Casanare, Cundinamarca, Guaviare, Meta, Risaralda and Vaupés. New geographic records for *S. gerstchi* (Roewer, 1963) and comments about its type locality are offered. Two species are recorded for the first time in Colombia: *Stygnus nogueirai* Pinto-da-Rocha & Tourinho, 2012 (departments of Guaviare and Vaupés) and *S. simonis* Sørensen, 1932 (department of Amazonas). Some new geographic records of the genus in the Amazon region are presented, and it is recorded for the first time in Ceará state (Brazil) and Madre de Dios department (Peru), with the presence of two unidentified species. Updated distributional maps of the genus in Colombia and South America are offered. Finally, in taxonomic studies of Gonyleptoidea, six longitudinal rows of tubercles have been described on the legs. Here, these rows are identified for a species of the genus *Stygnus* and an additional row is detected and named.

Keywords. Amazonas, Brazil, Gonyleptoidea, harvestmen, Peru, Stygninae.

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Introduction

The neotropical family Stygnidae Simon, 1879 was taxonomically and systematically reviewed more than two decades ago (Pinto-da-Rocha 1997), but since then, a significant number of contributions have been published (e.g., Kury 2009; Pinto-da-Rocha & Tourinho 2012; Kury & Villarreal 2015; Villarreal *et al.* 2019, 2021b, 2022). Most of these works have focused on the description of new species or genera, mainly dealing with the Brazilian and Venezuelan fauna. However, some occasional contributions have been made for Colombian stygnids, and to date, 15 species and nine genera of the family have been recorded for this country (Kury 2003; Villarreal & Rodríguez 2006; Kury & Villarreal 2015; Villarreal *et al.* 2023). This number seems insufficient, given the high biodiversity recorded for Colombia, which has 75 157 recorded species of fauna and flora (SiB Colombia 2023).

Stygnus Perty, 1833, is the second most diverse genus within Stygnidae composed of 23 described species from Bolivia, Brazil, Colombia, Ecuador, French Guiana, Peru and Venezuela (Pinto-da-Rocha 1997; Pinto-da-Rocha & Tourinho 2012; WCO 2024). In Colombia only three species have been recorded: *Stygnus gertschi* (Roewer, 1963) from the department of Cauca and *S. pectinipes* (Roewer, 1943) and *S. simplex* (Roewer, 1913) from the department of Putumayo; however, the genus has been recorded with at least three unidentified species from the department of Magdalena (de Moya *et al.* 2021).

This paper presents a taxonomic revision of the genus *Stygnus* in Colombia, leading to the discovery and description of an undescribed species from the departments of Guaviare and Vaupés. Additionally, new records of the genus *Stygnus* are presented from Brazil, Colombia and Peru; for the first time the genus is recorded from eight Colombian, one Peruvian and one Brazilian department(s)/state(s). Furthermore, two species are newly recorded for Colombia. Finally, comments about the type locality of *S. gertschi* are made and a map is presented, showing the current geographical distribution of the genus in South America with emphasis on Colombia.

Material and methods

The specimens examined here are deposited in Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia (ICN-Ao, curator Eduardo Flórez) and Colección entomológica, Museo Javeriano de Historia Natural, Bogotá, Colombia (MPUJ_ENT, curator Giovanny Fagua). Vouchers used for the new records of unidentified species of *Stygnus* are listed in Table 1. All measurements are in millimeters, were taken with a stereo microscope and refer to the maximum length and width. Where certain measurements were unavailable, these were represented by a question mark (?), indicating the absence of data for that particular measurement. Setiferous tubercles (i = small, I = large) on pedipalps are given in proximal to distal order. Color descriptions use the standard names of the 267 Color Centroids of the NBS/IBCC Color System as named in Centore (2016).

The description pattern follows Villarreal *et al.* (2019, 2021b) with subtle modifications; the nomenclature of the rows of tubercles on the legs follows DaSilva & Gnaspini (2010) and Hara & Pinto-da-Rocha (2010); the colors used in the schematic views of the legs are modified from Ázara & Kury (2019); the integumentary ornamentation follows DaSilva & Gnaspini (2010), the terminology for chaetotaxy of penis lamina parva and malleus follows Kury & Villarreal (2015), the term “ventral crack” is used as defined by Villarreal *et al.* (2019) and terminology of dorsal scutum types follows Kury & Medrano (2016). The terms ‘varillal’ and ‘terra firme’ were used to represent two types of vegetational formations: white-sand forests and upland tropical forests, respectively. The use of quotation marks in species names suggests that the species does not belong to the genus, but the authors do not currently have a supported alternative combination.

Pictures of the new species were taken using a Leica M205A stereo microscope coupled to a Leica MC–170 HD camera, coupled to a Nikon Eclipse E100 microscope. All the other images were taken

Table 1. Vouchers used to the new records of unidentified species of *Stygnus* Perty, 1833.

Species	Sex	Collection code	Country	Locality	Geographical coordinates
<i>Stygnus</i> sp.	♂	ICN-Ao 337	Colombia	Sierra Nevada de Santa Marta, Magdalena	11°6'42.74" N, 74°2'27.28" W
<i>Stygnus</i> sp.	♀	ICN-Ao 335	Colombia	Comunidad Indígena La Ceiba, Inírida, Guainía*	3°37'58" N, 67°53'22" W
<i>Stygnus</i> sp.	♀	ICN-Ao 410	Colombia	Comunidad Indígena La Ceiba, Inírida, Guainía*	3°37'58" N, 67°53'22" W
<i>Stygnus</i> cf. <i>simonis</i>	♀	—	Colombia	San Martín de Amacayacu, Leticia, Amazonas	3°47'14.96" S, 70°17'48.44" W
<i>Stygnus</i> cf. <i>pectinipes</i>	♂	—	Brazil	Close to Manaus (between Juma and Mamori)	3°44'3.20" S, 59°58'47.61" W
<i>Stygnus</i> sp.	♀	—	Brazil	Close to Manaus (between Juma and Mamori)	3°44'3.20" S, 59°58'47.61" W
<i>Stygnus</i> sp.	♀	—	Brazil	Close to Manaus (between Juma and Mamori)	3°44'3.20" S, 59°58'47.61" W
<i>Stygnus</i> sp.	♂	—	Brazil	Igarapé-Miri, Pará	1°59'47.20" S, 48°57'2.72" W
<i>Stygnus</i> sp.	♀	—	Brazil	Igarapé-Miri, Pará	1°59'47.20" S, 48°57'2.72" W
<i>Stygnus luteus</i>	♂	—	Brazil	Mazagão, Amapá	0°2'23.76" N, 52°6'58.50" W
<i>Stygnus</i> sp.	♂	—	Brazil	Marabá, Pará	5°25'2.98" S, 49°7'22.95" W
<i>Stygnus</i> sp.	♀	—	Brazil	Marabá, Pará	5°25'2.98" S, 49°7'22.95" W
<i>Stygnus</i> sp.	♀	—	Brazil	Pousada, Recanto Dos Pássaros	1°55'45.5" S, 60°4'0.7" W
<i>Stygnus</i> sp.	♂	—	Brazil	Floresta Nacional do Jamari, Rondônia	9°15'24.87" S, 62°55'34.98" W
<i>Stygnus</i> sp.	♂	—	Brazil	Floresta Nacional do Ubajara, Ceará*	3°49'3.36" S, 40°53'59.48" W
<i>Stygnus</i> sp.	♂	—	Peru	Parque Nacional Manu o Puerto Maldonado, Madre de Dios*	12°2'27.06" S, 71°43'23.42" W

*Departament/State

using a Nikon P1000 camera, with a 35 mm lens. Multiple images of each species at different focal planes were combined with CombineZP Suite software (Hadley 2015) to increase the depth of field and were subsequently edited in Photoshop CC 2017 software.

Drawings of the species were made using Inkscape ver. 0.91 software (Harrington *et al.* 2004–2005) and Adobe Illustrator CC 2017. The penis of the new species was illustrated in dorsal, lateral and ventral views. The penis of the previously described species treated here were illustrated in dorsal and lateral views, since they were only known from SEM photographs except the penis of *Stygnus gertschi*, which was recently illustrated in Pinto-da-Rocha (1997), and of *S. simonis* Sørensen, 1932, whose males are unknown.

For the complete synonymic listing of the genus, see Pinto-da-Rocha (1997) and Kury (2003). The principal administrative divisions of Colombia (department) are in bold. The words *corregimiento* and *vereda* refer to an administrative division of a municipality in Colombia and do not have a direct translation to English. Records lacking coordinates were approximated to locations via online gazetteers and are presented in brackets. The distribution maps were made using Quantum GIS ver. 3.30.0 software (www.qgis.org/, QGIS Development Team 2018). The colored shapes refer to WWF Terrestrial Ecoregions of the World (Olson *et al.* 2001). The data mapped correspond to material reviewed in scientific collections, literature records and photographic records; the latter are shown in Figs 11 and 12, and Table 1.

Abbreviations for taxonomic characters

DS	=	dorsal scute
DSL	=	dorsal scute length
DSW	=	dorsal scute width
ID	=	interocular distance
LP	=	lamina parva
MS-A1–A3	=	basal macrosetae of malleus
MS-B	=	ventro-basal macrosetae of malleus
MS-C1–C3	=	laterodistal macrosetae of LP
MS-D1	=	dorso-lateral subdistal small pair of setae of LP

Results

Taxonomy

Class Arachnida Lamarck, 1801
Order Opiliones Sundevall, 1833
Family Stygnidae Simon, 1879
Subfamily Stygninae Simon, 1879
Genus *Stygnus* Perty, 1833

Stygnus apaporis sp. nov.

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Figs 1–3, 4A–C, 13

Diagnosis

The species resembles *Stygnus kuryi* Pinto-da-Rocha & Tourinho, 2012 in the morphology of legs IV of the males and the genital morphology. However, the new species can be differentiated from *Stygnus kuryi* by its size (*S. kuryi* is clearly larger: DSL 4.4 vs 2.12 mm, DSW 3.7 vs 2.23), coloration (*S. kuryi* is darker than *S. apaporis* sp. nov.) (Fig. 1) and the ornamentation of the femur IV of the males (*S. apaporis*

has a proventral row of tubercles, absent in *S. kuryi*) (Fig. 3B). The penises of both species have some differences: the shape and distribution of MSC (in *S. apaporis* they are small and aligned, whereas in *S. kuryi* they are large and grouped) (Fig. 4A–C); the shape of the malleus (in *S. kuryi* the malleus is expanded dorsally) (Fig. 4A–B) and the shape of the complex gland and stylus (G+S): the size of the dorsal process and elongated shape of the G+S (Fig. 4A–B).

Etymology

The species name is a noun in apposition and refers to the type locality, Apaporis, an important Amazonian river of the departments of Vaupés and Guaviare in Colombia. It is a tributary of the Caquetá River. In the last stretches, before the river joins the Caquetá, it forms part of the boundary between Colombia and Brazil.

Type material

Holotype

COLOMBIA – **Vaupés** • ♂; Lago Taraira, Estación Biológica Mosiro Itájura Caparú; 1°04' S, 69°30' W; alt. 200 m; 2002–2004; J. Pinzón leg.; ICN-Ao 1890.

Paratypes

COLOMBIA – **Guaviare** • 1 ♀; San José del Guaviare, vereda Playa Güio Las Iracas; 2°34'37.5" N, 72°43'21.1" W; alt. 208 m; 20 Oct. 2012; D. Luna leg.; ICN-Ao 1128. – **Vaupés** • 4 ♂♂, 4 ♀♀; same data as for holotype; ICN-Ao 978.

Description

Males

MEASUREMENTS. Male holotype (ICN-Ao 1890). DSL = 2.12; DSW = 2.23; ID = 1.51; pedipalpus: coxa = 0.27, trochanter = 0.37, femur = 1.87, patella = 0.90, tibia = 0.63, tarsus = 0.62, total = 4.66; leg IV: coxa = 0.62, trochanter = 0.49, femur = 3.47, tibia = 1.65, metatarsus = 2.98, total = 11.25.

DORSUM (Figs 1–2). Dorsal scutum outline of beta type. Anterior area of DS with large, scattered granules. Cheliceral sockets shallow and narrow, between two short processes, and with a medial wide and short process. Eyes with a row of 3–4 medium granules, placed posteriorly on carapace. Interocular region with one large spine and six granules in base. Laterals margins of DS with medium scattered granules. Mesotergum divided into three areas: I divided medially in two halves, with eight–ten large granules on each side; II with about 25 granules organized approximately in a transverse medial row; III with about 22 scattered granules, grouped mainly in lateral region, and with a pair of paramedian divergent and very large backwards spines, with base granulated. Posterior margin slightly convex with a row of granules. Free tergites I–III with a row of granules, and a paramedian pair of large tubercles ($3 > 2 > 1$).

VENTER (Figs 1D, 2B). Coxa I with small, scattered granules; II with a medial row of small granules and three apicals; III with small, scattered granules, and posterior margin with a row of medium granules; IV with distal tubercle and scattered granules. Genital operculum with five small granules. Free sternites with a row of small granules.

CHELICERAE (Figs 1B, 2A–B). Segment I with four–five dorsoectal and proximal granules on bulla; II inflated, with small, scattered granules in the ectal side; fixed finger with three distal teeth (iii); mobile finger with a large basal tooth and with three distal teeth (I_iii).

PEDIPALPS (Fig. 2C–D). Coxa dorsally with one basal and one distal small tubercle; ventrally with two conspicuous tubercles; and two conspicuous ectal tubercles. Trochanter dorsally and ventrally with one large medial tubercle, with one additional medium basal tubercle on the ventral side. Femur dorsally and

ventrally with a row of small granules, and one mesal medium tubercle on distal portion. Patella slightly swollen distally, with one tubercle and scattered small granules in ectal side. Tibia dorsally smooth, ventrally with scattered, small granules; tibia mesal IIIi, ectal IIiIi. Tarsus dorsally smooth, ventrally with scattered, small granules; tarsus mesal Iii, ectal Iiii.

LEGS (Fig. 3A–D). The leg segments (femur, patella, tibia) have longitudinal rows of tubercles (more or less arranged in seven rows on the femur). Coxae I–III dorsally and ventrally with some granules; IV with one longitudinal row of tubercles of different sizes, and one medial apophysis in distal portion. Trochanter I with three prodorsal tubercles; II smooth; III with one retrodorsal row of small tubercles; IV with one retrodorsal tubercle and scattered granules. Femora I–II with one retrodorsal and prodorsal row of small tubercles; III with one prolateral row of tubercles increasing in size distally and a retrolateral row of small tubercles; IV with one dorsal and one prodorsal row of tubercles of similar size (distal-



Fig. 1. *Stygnus apaporis* sp. nov., holotype (ICN-AO-1890). **A.** Habitus, panoramic dorsal view. **B.** Detail of dorsal scutum and chelicerae, dorsal view. **C.** Panoramic lateral view. **D.** Detail of the body and chelicera, lateral view. Scale bars = 1 mm.

most tubercle of prodorsal row conical), one prolateral and one retrolateral row of tubercles of different sizes, and one proventral and one retroventral row of tubercles increasing in size distally (distal-most tubercle of proventral row conical and thicker than others). Patellae I–II dorsally and ventrally with some minute granules; III with one retrodorsal row of medium tubercles; IV with one retrodorsal row of tubercles increasing in size distally (distal-most tubercle of row conical and thicker than others), and one prolateral row of four tubercles, third tubercle larger than others. Tibiae I–III dorsally and ventrally with some minute granules; tibiae VI with one dorsal and prodorsal row of small granules, and one prolateral and retrodorsal row of medium tubercles; IV ventrally with two apical conical tubercles. Metatarsi I–IV smooth. Basitarsus I inflated and two times as long as other tarsomeres. Tarsi I–II each with one smooth claw; III–IV with two smooth subparallel claws and tarsal process reduced. Legs III–IV without tarsal scopula. Tarsal segmentation: 7(3)/11(3)/5/6.

PENIS (Fig. 4A–C). LP trapezoidal in dorsoventral view, with distal border rounded; LP clearly differentiated from truncus/malleus by a ventral crack. Stylus dorsally curved, with a short triangular dorsal process. All MS A–D located on LP and not on truncus: MS-A1–3 straight, forming a transverse straight line, inserted at base of LP, slightly distal to insertion of gland; MS-B absent; MS-C1–3 inserted in dorsomedial region of LP, large and slightly curved, positioned dorsolaterally, forming an inclined row on longitudinal axis and equally spaced from each other; MS-D1 positioned medially on dorsal face

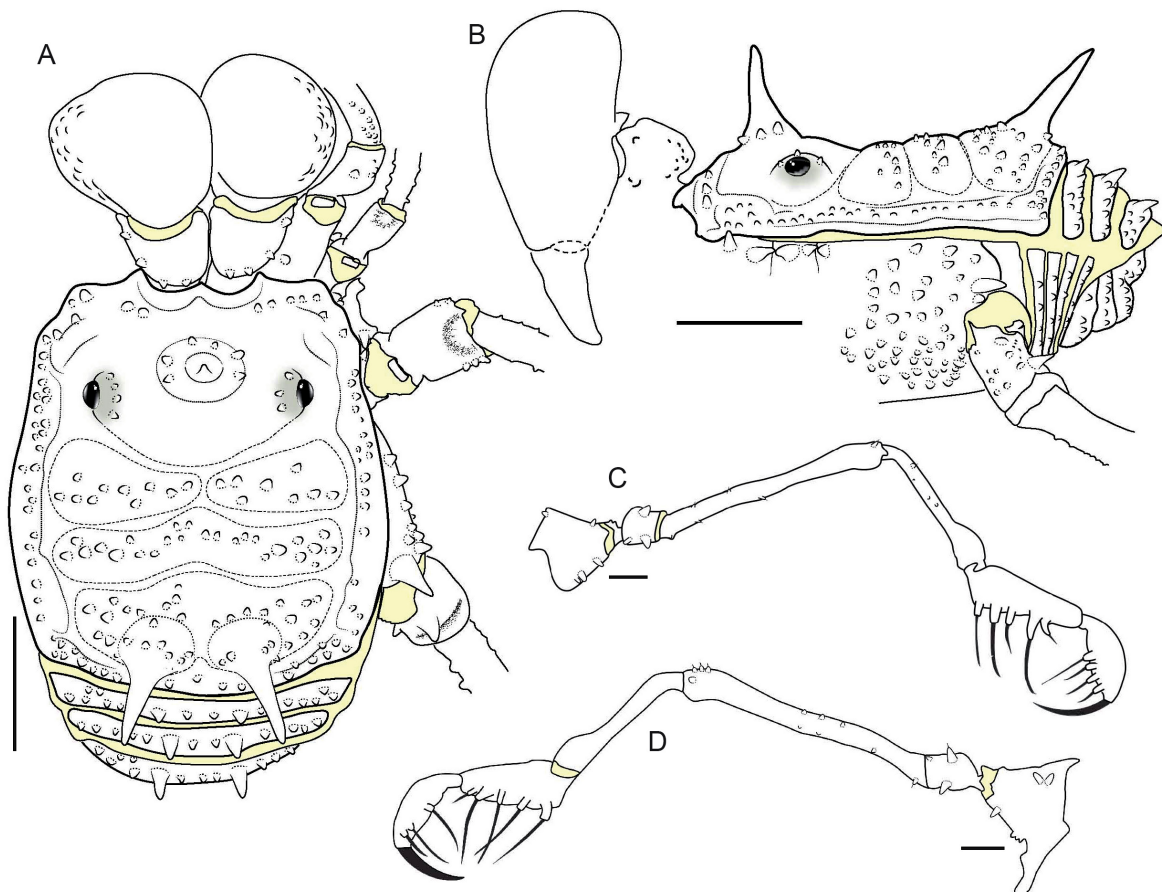


Fig. 2. *Stygnus apaporis* sp. nov., holotype (ICN-Ao-1890). **A–B.** Habitus, dorsal (A) and lateral (B) views. **C–D.** Right pedipalp, mesal (C) and ectal (D) views. Membrane zones are represented in light yellow. Scale bars = 1 mm.

of LP, MS-D2 absent; only one pair of MS-E, minute and conical, observed, probably due to optical limitations.

COLORATION (Fig. 1A–D). Body and appendages Strong Orange (55); prosoma reticulated, Deep yellowish brown (75) on Strong yellowish brown (74); dorsal scutum margin Deep yellowish brown (75); coxae I–III and pedipalps (except coxa) Brilliant yellow (83); chelicerae reticulated, Deep yellowish brown (75) on Strong yellowish brown (74); ocularium bases Dark olive (108); tips of area III paramedian spines and free tergite III Vivid yellow (82).

Females

Similar to males, except for: chelicera not swollen; legs finely granular; distitarsus I not inflated and elongated; legs IV without large tubercles. Pedipalpal tibia mesal IIIi, ectal IIIi; tarsus mesal Iii, ectal Iii (constant in most females).

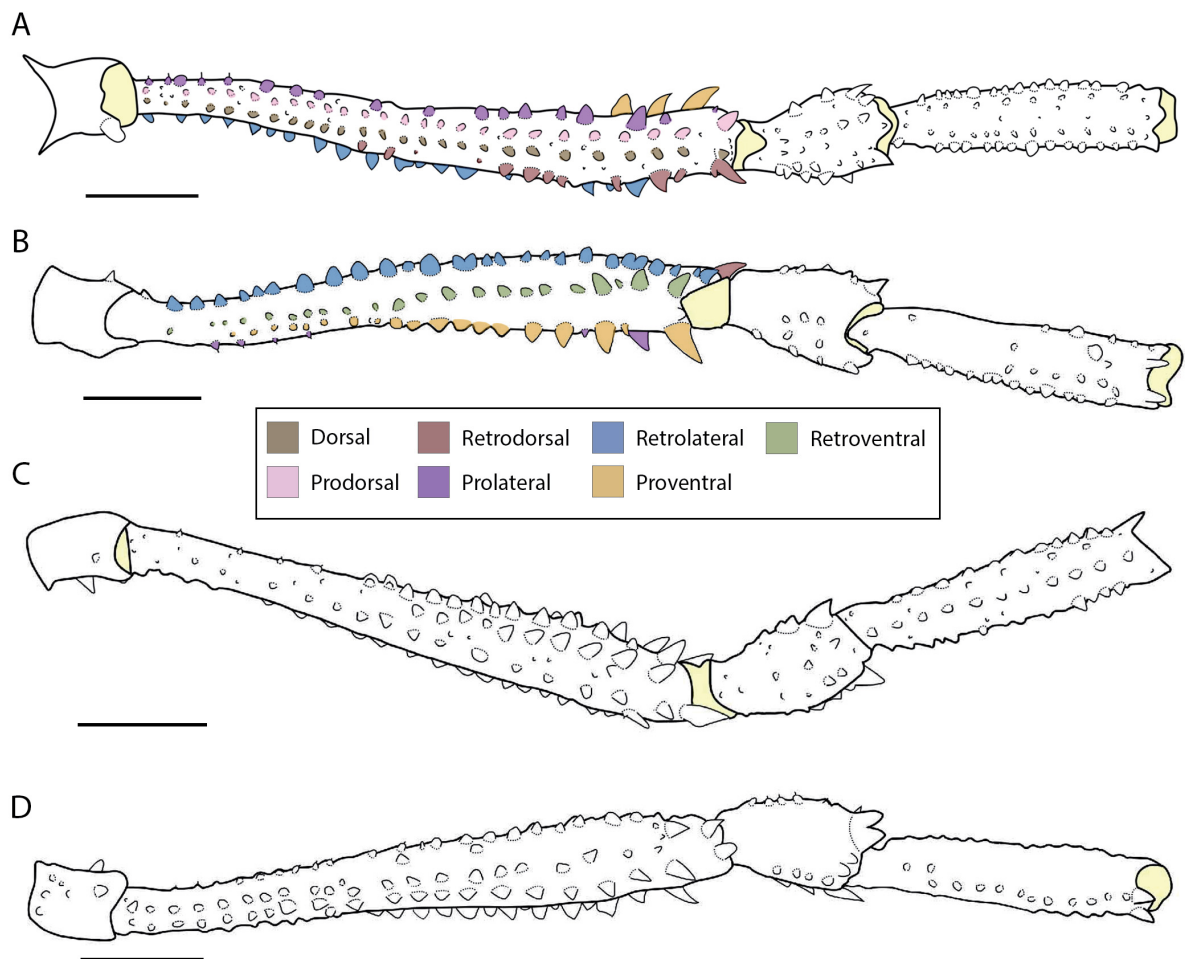


Fig. 3. *Stygnus apaporis* sp. nov., holotype (ICN-Ao-1890). **A–D.** Right leg IV: dorsal (A), ventral (B), prolateral (C) and retrolateral (D) views. The color of each longitudinal row of tubercles is defined in the inset. The membrane zones are represented in light yellow. Scale bars = 1 mm.

Intraspecific variations

Paratype measurements (females n = 5, min–max): dorsal scutum length = 2.15–2.30; dorsal scutum width = 1.94–2.25; interocular distance = 1.3–1.4; pedipalp: coxa = 0.15–0.31, trochanter = 0.24–0.49, femur = 1.12–1.78, patella = 0.54–1.13, tibia = 0.50–0.70, tarsus = 0.45–0.60, total = 3.70–4.50; leg IV: femur = 2.8–3.20, tibia = 1.16–1.70, metatarsus = 3.0–3.12, total = 10.46–10.52; (males n = 2, min–max):

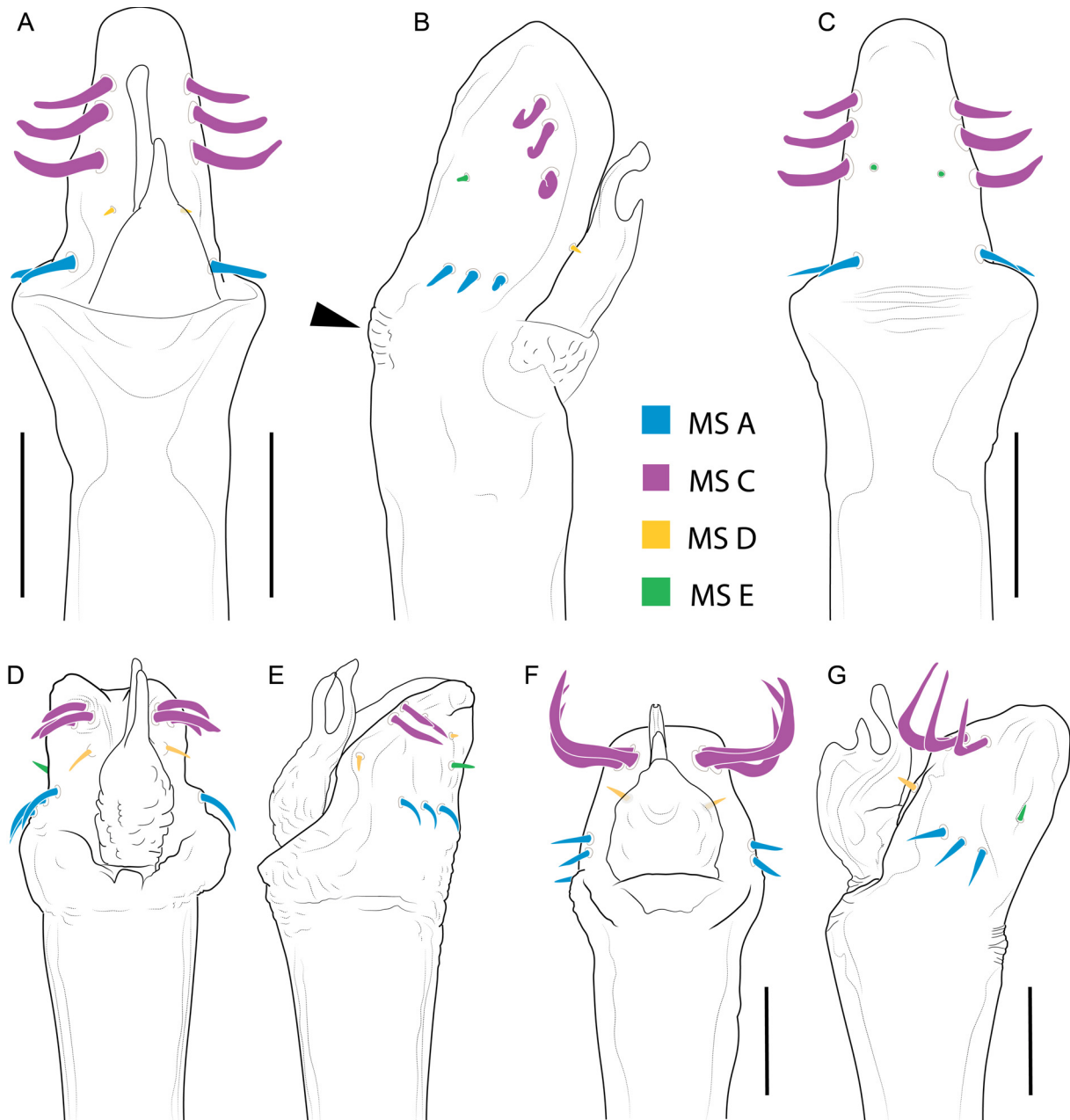


Fig. 4. *Stygnus* spp., apical portion of the penis. **A, D, F.** Dorsal view. **B, E, G.** Lateral view. **C.** Ventral view. **A–C.** *S. apaporis* sp. nov., paratype (ICN-Ao 978). **D–E.** *Stygnus nogueirai* Pinto-da-Rocha & Tourinho, 2012 (ICN-Ao 485). **F–G.** *Stygnus simplex* (Roewer, 1913) (ICN-Ao 1889). Arrow in B indicates the ventral crack. Abbreviation: MS = macrosetae. Macrosetae group A (MS A) is represented in blue, group C (MS C) is represented in pink, group D (MS D) is represented in yellow and group E (MS E) is represented in green. Scale bars = 1 mm. Figures D–E not to scale.

dorsal scutum length = 2.85–2.88; dorsal scutum width = 2.22–2.31; interocular distance = 1.00–1.05; pedipalp: coxa = 0.50–0.81, trochanter = ?–0.44, femur = ?–1.40, patella = ?–1.45, tibia = ?–1.00, tarsus = ?–0.76, total = ?–5.86; leg IV: femur = 3.35–3.58, tibia = ?–1.78, metatarsus = ?–3.64, total = ?–10.88.

Spines of the tibia and tarsus of the pedipalps of different sizes in some males and females.

Habitat remarks

Stygnus apaporis sp. nov. inhabits localities characterized by tropical humid forests in the departments of Vaupés and Guaviare. These areas, including the Parque Nacional Natural (PNN) Serranía del Chiribiquete, the PNN Nukak and the PNN Amacayacu, are experiencing escalating deforestation, due to the expansion of agricultural and livestock activities in the post-conflict period in Colombia (Clerici *et al.* 2020).

Distribution (Fig. 13)

Colombia, Vaupés: Lago Taraira, Estación Biológica Mosiro Itájura Caparú, and Guaviare: San José del Guaviare, vereda Playa Güio Las Iracas.

Stygnus gertschi (Roewer, 1963)

Figs 5A–D, 13

Material examined

COLOMBIA – **Cundinamarca (new department record)** • 1 ♀; La mesa, San Francisco; [4.63° N, 74.46° W]; alt. 1200 m; 16 Nov. 2012; W. Galvis leg.; ICN-Ao 1195. – **Meta (new department record)** • 1 ♂, 3 ♀♀; San Martín, Hato las Pampas, Reserva Natural Las Unamas; 3°42'24.12" N, 73°40'39.99" W; alt. 300 m; 2 Jul. 2012; W. Galvis leg.; ICN-Ao 1095 • 1 ♀; Principal Villavicencio-Cumaral, vereda San José, Guatavia River; 4°24'12.61" N, 73°42'2.29" W; alt. 467 m; 24 Jun. 1992; E. Triana leg.; ICN-Ao 2000 • 1 ♂, 1 ♀; same data as for preceding; L. Arévalo leg.; ICN-Ao 1891 • 1 ♂; Acacías, vereda La Esmeralda, Finca Versalles; 03°57'36.69" N, 73°42'12.95" W; alt. 514 m; 21 Apr. 2004; E. Flórez, animal systematics students, Biol. UN leg.; ICN-Ao 412 • 2 ♀♀; San Martín, vereda Las Pampas, Reserva Las Unamas; [3.57° N, 73.46° W]; alt. 300 m; 8–15 Jan. 2013; W. Galvis leg.; ICN-Ao 1190 • 2 ♂♂, 2 ♀♀; Villavicencio, Apiay; [4.08° N, 73.56° W]; alt. 450 m; 14 Oct. 2003; manual collection, logs; A. Rico, V. Phandanauvong leg.; ICN-Ao 408 • 1 ♂, 1 ♀; Villavicencio, Apiay; 04°5'11.24" N, 73°34'11.62" W; alt. 450 m; 14 Oct. 2003; E. Flórez, students of Biología UN, Curso Aracnología leg.; ICN-Ao 406 • 1 ♀; San Juan de Arama, Reserva la Macarena, Caño La Curia; 03°17'6.80" N, 73°54'21.02" W; alt. 450 m; 18 Jan. 1992; F. Guzman, S. Espinosa leg.; ICN-Ao 64 • 1 ♀; Puerto López, Cafam Llanos; 04°02'19.5" N, 72°45'71.3" W; alt. 200 m; ICN-Ao 600 • 1 ♀; La Macarena, Puerto Marimba, Serranía Macarena, río Duda; 02°32'5.48" N, 73°55'45.08" W; A. Calixto leg.; ICN-Ao 336 • 1 ♀; Villavicencio, Bosque Bavaria; 04°13'57.62" N, 73°38'32.87" W; 14 May 2005; C. Rueda leg.; ICN-Ao 508 • 1 ♂; Puerto López; 04°02'19.5" N, 72°45'71.3" W; alt. 219 m; 1 May 2009; D. Luna leg.; ICN-Ao 712 • 1 ♂; Puerto López, Cafam Llanos, bosque Mata Mata; 04°16'51.86" N, 72°31'30.96" W; Sep. 2003; ICN-Ao 662 • 2 ♂♂, 1 ♀; Cumaral, Finca Panitos; [4.26° N, 73.48° W]; alt. 510 m; 15–16 Nov. 2001; MPUJ_ENT 0094614 • 1 ♀; Pto. Gaítan, Altamira, Club Los Llaneros, Galería forest; [4.36° N, 72.09° W]; alt. 145 m; 20 Oct. 2005; Pedraza leg.; MPUJ_ENT 0094621 • 1 ♂; San Martín, Reserva Rey Zamuro-Matarredonda, Galería forest; [3.51° N, 73.39° W]; 28 Aug.–1 Sep. 2017; Morris, Peña, Pinto leg.; manual collection; MPUJ_ENT 0055169 • 1 ♀; San Martín, Reserva Rey Zamuro-Matarredonda, approx. 37 km ESE of San Martín; 03.53173° N, 73.40181° W; alt. 293 m; 28 Aug.–1 Sep. 2017; D. Osorio, A. Beltran leg.; MPUJ_ENT 0046868 • 4 ♂♂, 2 ♀♀; Pto. López, CAFAM; [4.20° N, 72.52° W]; Sep. 1991; J. Ángulo leg.; MPUJ_ENT 0094617 • 1 ♂; same data as for preceding; 29–31 Aug. 2022; J. Vargas leg.; manual collection; MPUJ_ENT 0094622 • 1 ♂; same

data as for preceding; 28 Aug.–1 Sep. 2017; C. Pineda leg.; manual collection; MPUJ_ENT 0057026 • 1 ♀; Pto. Gaitán, Altamira, Club Los Llaneros, Sabana; [4.36° N, 72.09° W]; alt. 140 m; 22 Oct. 2006; A. Sandoval, L. Vela, L. Linares leg.; MPUJ_ENT 0094618 • 1 ♂; Remolinos, Centro CAFAM Llanos, aprox. 55 km W from Pto. Gaitán, Sabana; 4.274963° N, 72.540814° W; alt. 165 m; 11–15 Mar. 2013; manual collection; S. Prieto leg.; MPUJ_ENT 0094615. – **Casanare (new department record)** • 1 ♂; Villanueva, Vereda Caimán alto; 21 Aug. 2010; D. Luna leg.; ICN-Ao 793 • 2 ♂♂; Villanueva; 19 Jul. 2010; D. Luna, A. Rincón, C. Reina leg.; ICN-Ao 284 • 1 ♂, 1 ♀; Villanueva; 04°36'8.53" N, 72°55'29.34" W; 20 Aug. 2010; A. Rincón, D. Luna and C. Reina leg.; ICN-AO 407 • 1 ♀; Tauramena,

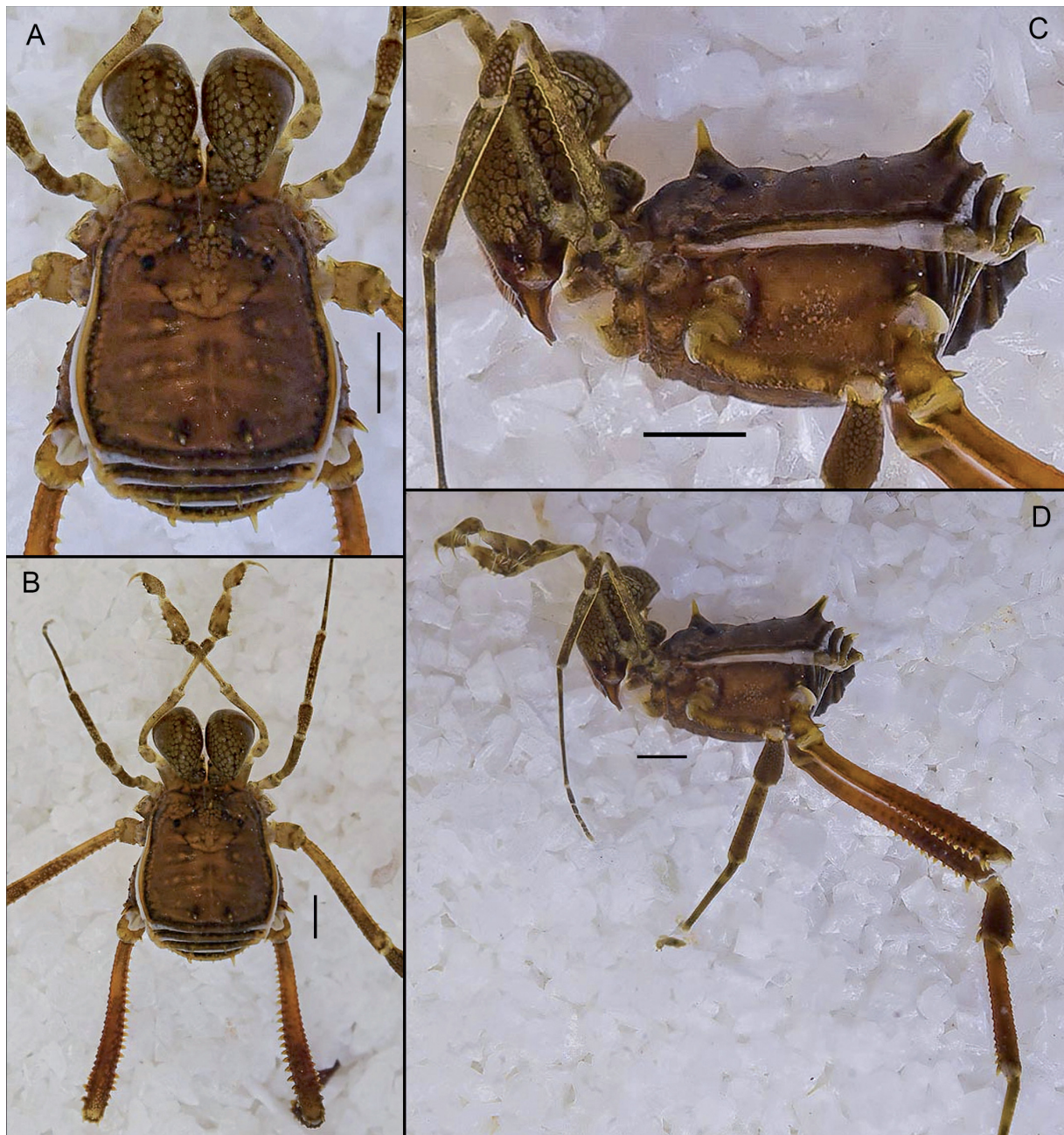


Fig. 5. *Stygnus gertschi* (Roewer, 1963) (ICN-Ao 1095). **A.** Detail of dorsal scutum and chelicerae. **B.** Habitus, panoramic dorsal view. **C–D.** Lateral view, detail (C) and panoramic (D) view and detail of the body and chelicerae. Scale bars = 1 mm.

kiosko verde, Galería forest, aprox. 2.5 km SW from Tauramena; 5.00385° N, 72.77376° S; 8–12 Sep. 2014; J. Hernández leg.; MPUJ_ENT 0027462 • 1 ♀; same data as for preceding; L. Trujillo leg.; MPUJ_ENT 0026637 • 1 ♀; same data as for preceding; 25–29 Aug. 2014; A. Botache leg.; manual collection; MPUJ_ENT 0024795.

Doubtful record

Colombia: Department of Cauca (Pinto-da-Rocha 1997; Kury 2003).

Remarks

The type locality is recorded by Roewer (1963) as “Columbien: Monteredoudo”. Pinto-da-Rocha (1997) corrected the name of this locality to “Monterredondo” and assigned it to the Cauca department, disregarding other potential homonymous localities. This correction was subsequently followed by Kury (2003). Helmut Sturm, a German taxonomist, made significant contributions to the understanding of jumping bristletails in Colombia, and collected the types of *Stygnus gertschi*. He conducted fieldwork in Colombia visiting various localities in the Cundinamarca department. During our study, we examined specimens of this species from localities in the departments of Meta and Cundinamarca, near a locality known as Monterredondo in the department of Cundinamarca. Based on this circumstantial evidence and the absence of confirmed specimens from Cauca, we propose that the true type locality of the species must be Monterredondo in Cundinamarca rather than Cauca.

Distribution

Colombia: Cundinamarca, Meta and Casanare, from 200 to 1200 m.

Stygnus luteus (Mello-Leitão, 1931)

Figs 10A, 13

Material examined (only photo)

BRAZIL – Amapá • 1 spec.; Mazagão; 0°2'23.76" N, 52°6'58.50" W.

Distribution

Brazil: Pará (Mello-Leitão 1931; Pinto-da-Rocha 1997; Kury 2003); Amapá and Mato Grosso (Kury 2003).

Stygnus nogueirai Pinto-da-Rocha & Tourinho, 2012

Figs 6A–D, 13

Material examined

COLOMBIA (new country record) – **Guaviare** • 1 ♂; Calamar, Parque Nacional Natural Chiribiquete, Cerro Campana; 01°17'15.9" N, 72°37'53.7" W; alt. 242 m; 4 Mar. 2018; D. Luna and A. Pinzón leg.; manual night collection, terra firme forest, varillal vegetation, Exp. ColombiaBIO Apaporis; ICN-Ao-1910. – **Vaupés** • 1 ♂, 2 ♀♀; Lago Taraira, Estación Biológica Mosiro Itájura Caparú; 1°04' S, 69°30' W; alt. 200 m; 2002–2004; J. Pinzón leg.; ICN-Ao 985 • 3 ♂♂; Corregimiento Pacoa, Comunidad de Buenos Aires, basin of Cananarí River, road to Comunidad Villarreal; 00°00'50.7" N, 71°00'35.2" W; alt. 148 m; 20 Feb. 2018; D. Luna and W. Gómez leg.; manual night collection, terra firme forest, varillal vegetation, Exp. ColombiaBIO Apaporis; ICN-Ao-1911 • 3 ♂♂; Corregimiento Pacoa, Comunidad de Buenos Aires, Cuenca río Cananari, Cerro Morroco; 00°08'01.9" N, 70°56'36.1" W; alt. 585 m; 26 Feb. 2018; D. Luna and W. Gómez leg.; manual night collection, floor, varillal vegetation, Exp. ColombiaBIO Apaporis; ICN-Ao-1912.

Distribution

Brazil: Amazonas (Pinto-da-Rocha & Tourinho 2012); Colombia: Guaviare and Vaupés, from 100 to 1200 m a.s.l.

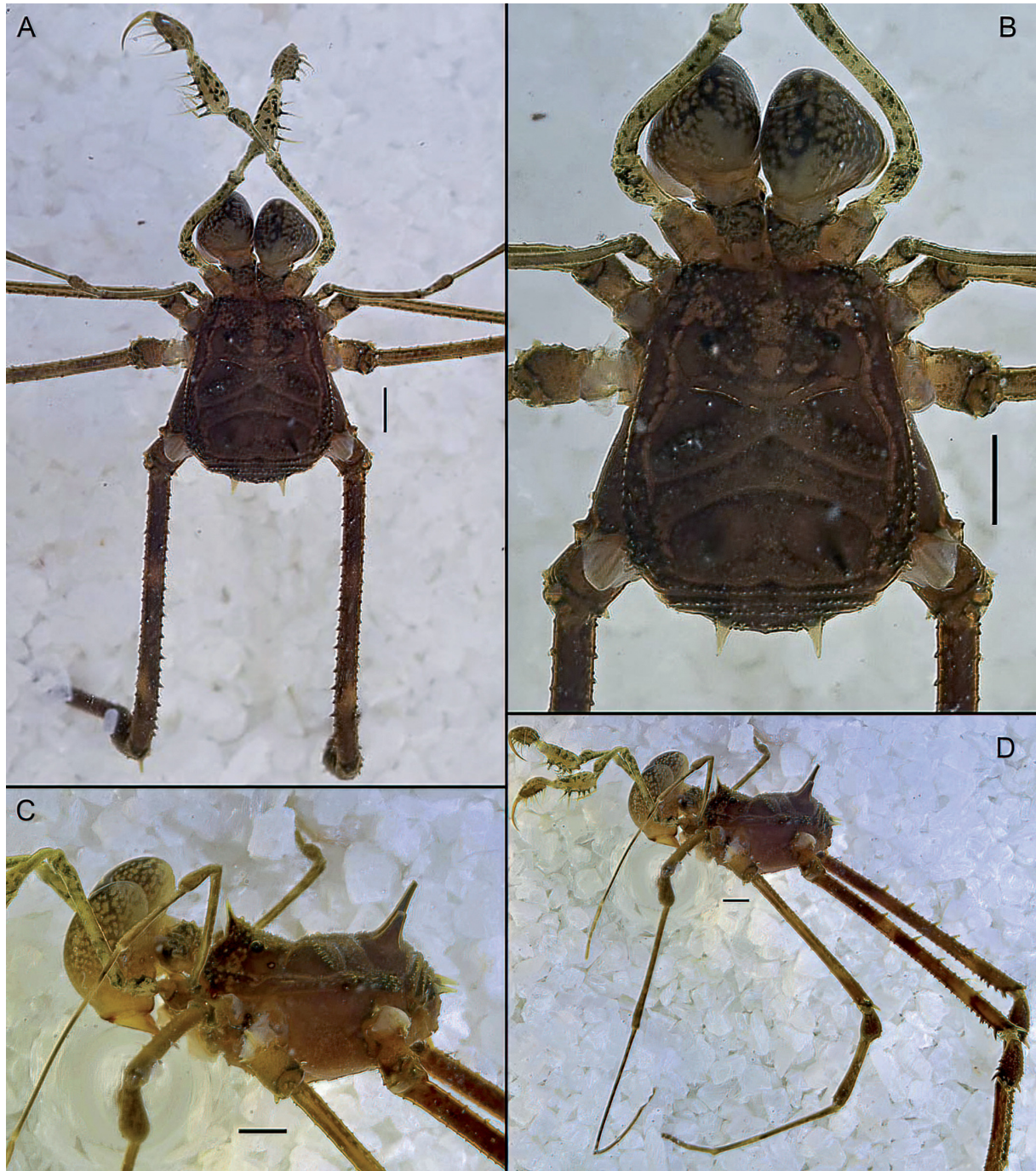


Fig. 6. *Stygnus nogueirai* (ICN-Ao 985). **A.** Habitus, panoramic dorsal view. **B.** Detail of dorsal scutum and chelicerae. **C.** Detail of the body and chelicera, lateral view. **D.** Panoramic lateral view. Scale bars = 1 mm.

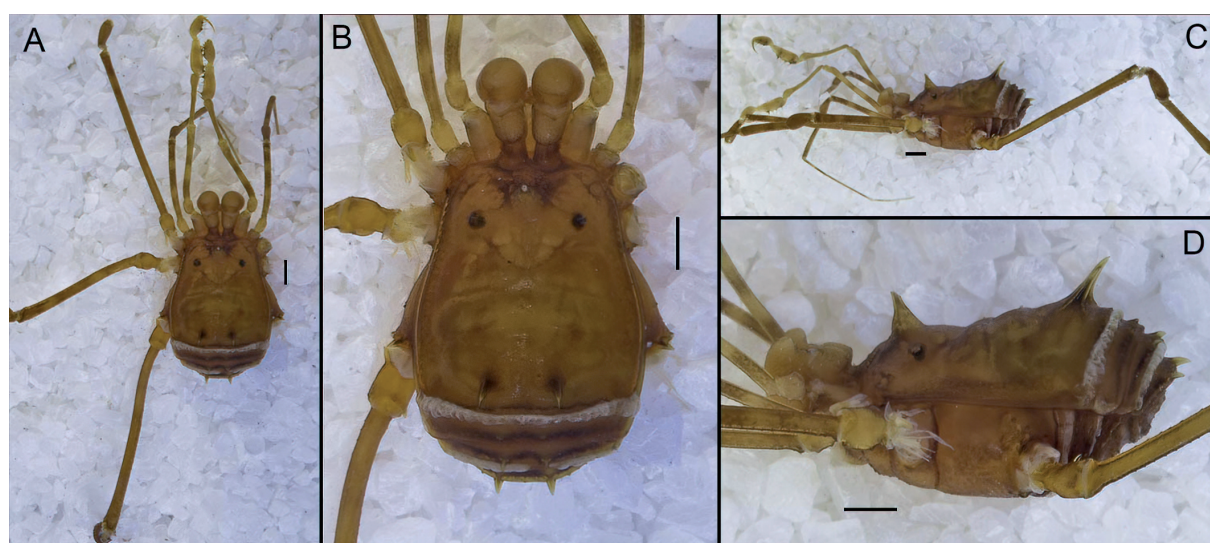


Fig. 7. *Stygnus simonis* (ICN-Ao 327). **A.** Habitus, panoramic dorsal view. **B.** Detail of dorsal scutum and chelicerae. **C.** Panoramic lateral view. **D.** Detail of the body, lateral view. Scale bars = 1 mm.

Stygnus simonis (Sørensen, 1932)

Figs 7A–D, 13

Material examined (assigned tentatively)

COLOMBIA (**new country record**) – Amazonas • 1 ♀; Leticia, indigenous community Monilla Amena; 4.1866° S, 69.9180° W; alt. 100 m; 11 Nov. 2001; biology students of the Universidad Nacional de Colombia, E. Flórez leg.; ICN-Ao 327 • 1 ♀; same locality as for preceding; alt. 80 m; 3 May 2002; Acuña, Orozco leg.; forest; MPUJ_ENT 0094605 • 1 ♀; same locality as for preceding; alt. 60 m; 9 Nov. 2002; Botero leg.; manual collection; MPUJ_ENT 0094591 • 1 ♀; same locality as for preceding; alt. 80 m; 2 Oct. 2003; Mojica, Ortiz, Ospina leg.; várzea forest; manual collection; MPUJ_ENT 0094590.

Remarks

The specimens studied here exhibit the paired tubercles of free tergite III directed sub-parallel (non-divergent) and positioned closer to each other. However, due to a lack of knowledge about intraspecific variations and the unavailability of male specimens for studying genital morphology, the material from Colombia is assigned tentatively to this species.

Distribution

Peru: Loreto (Sørensen 1932; Kury 2003); Colombia: Amazonas.

Stygnus simplex (Roewer, 1913)

Figs 8A–D, 9A–B

Material examined (assigned tentatively)

COLOMBIA – Vaupés (**new department record**) • 1 ♂; Lago Taraira, Estación Biológica Mosiro Itájura Caparú; 1°04' S, 69°30' W; alt. 200 m; 2002–2004; J. Pinzón leg.; ICN-Ao 1889. • 1 ♂; Taraira, Estación Biológica Caparú; 1°04' S, 69°30' W; alt. 200 m; 24 Apr. 2013; L. Benavides leg.; ICN-Ao 340.

Remarks

The specimens studied here exhibit slight differences from the original description, particularly in the ornamentation of femur IV, with a row of larger retrolateral tubercles and the presence of an additional large tubercle on the distal prolateral area of the patella (Fig. 9). Additionally, the male genitalia show some notable variations in style+gland size in relation to the LP and the position of the MSC in the LP. These variations were compared with the description provided by Pinto-da-Rocha (1997). It's important to note that Roewer's description did not include an examination of the genitalia. However, our examination of the male genitalia revealed these important differences. Despite these variations, due to the overall morphological similarities between our specimens and those described in literature, as well as the geographical distance between the populations studied and the limited number of specimens evaluated, we tentatively assigned our specimens to *S. simplex*. Nevertheless, we acknowledge the necessity of further investigation, including the study of larger samples or methodologies such as molecular analysis to confirm this assignment.



Fig. 8. *Stygnus simplex* (ICN-Ao 1889). **A.** Habitus, panoramic dorsal view. **B.** Detail of dorsal scutum and chelicerae. **C.** Panoramic lateral view. **D.** Detail of the body, lateral view. Scale bars = 1 mm.

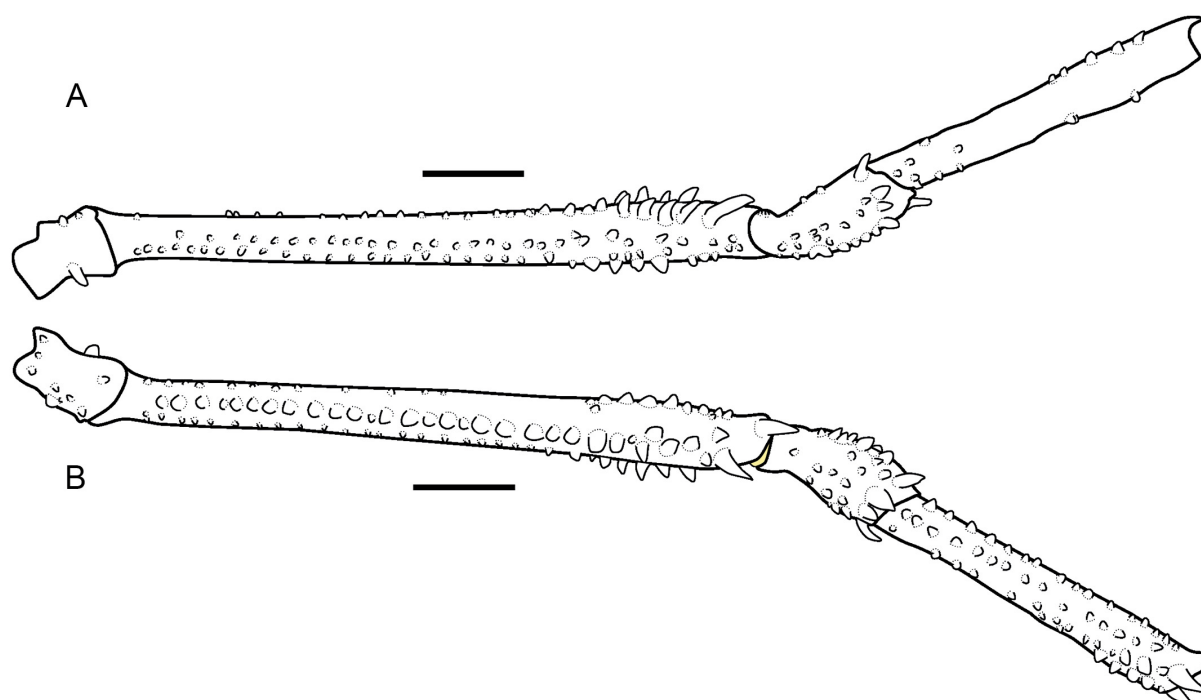


Fig. 9. *Stygnus simplex* (ICN-Ao-1889), left leg IV. **A.** Retrolateral view. **B.** Prolateral view. Scale bars = 1 mm.

Distribution

Ecuador: Napo (Roewer 1913); Colombia: Putumayo (Kury 2003) and Vaupés; Peru: Loreto.

On the diversity of Amazonian harvestmen in Colombia

Among the 173 nominal species of Laniatores Thorell, 1876 harvestmen recorded from Colombia, only 15 are known to inhabit the Amazon region (Villarreal *et al.* 2023), underscoring the limited understanding of the group's diversity in this region (Table 2). García (2014) highlighted the insufficient sampling efforts in the departments of Amazonas, Caquetá, Guaviare and Vaupés. Our results raise the tally to 19 known harvestman species for the Colombian Amazon region. Two species of the genus *Stygnus* previously documented in Brazil (*Stygnus nogueirai*) and Peru (*Stygnus simonis*) are herein recorded for the first time in Colombia, expanding the genus's geographic distribution within the country to include the departments of Amazonas, Caquetá, Casanare, Cundinamarca, Guainía, Guaviare, Meta and Vaupés (Fig. 13). Many of these new records are concentrated within the Amazon region. Notably, for the first time the occurrence of the order Opiliones is recorded in the departments of Guainía and Guaviare, since a previous wrong record in Guainía (reported by Pinto-da-Rocha 1997) was corrected by Kury (2003).

New geographic occurrences of unidentified species of *Stygnus* are detected: first record of the genus in Ceará state (Brazil) (Fig. 11E–F) and Madre de Dios department (Peru) (Fig. 12A). Additionally, supplementary records, supported by photographic evidence of unidentified species, confirm further occurrences in Amazonas, Brazil (Figs 11B, 12B–C); Pará, Brazil (Figs 10B, F, 11A, C–D, 12D); Rondonia, Brazil (Fig. 10C–D) and Amazonas, Colombia (Fig. 10E) (Table 1).

Discussion

Distribution

Our findings reveal a shared faunal component encompassing both the Colombian Amazon region and its neighboring countries (as depicted in Table 3). This observation is consistent with previous studies conducted on various arachnid taxa. For instance, *Uaiuara amazonica* (Simon, 1880) (Araneae:

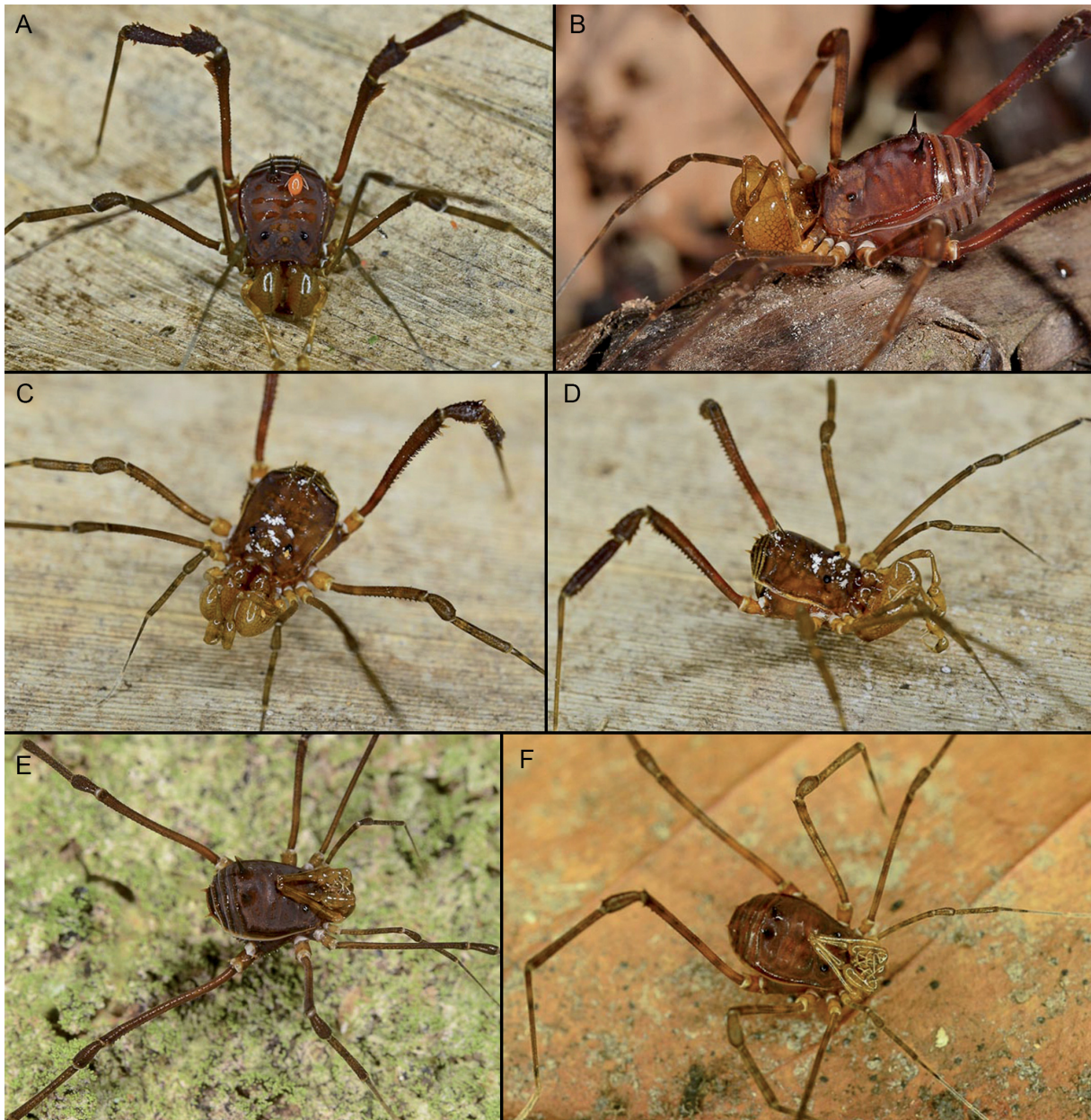


Fig. 10. *Stygnus* spp., live specimens. **A.** *Stygnus luteus* (Mello-Leitão, 1931), male from Mazagão, Amapá, Brazil. **B.** *Stygnus* cf. *pectinipes* (Roewer, 1943), male from Igarapé-Miri, Pará, close to Manaus (between Juma and Mamori), Brazil. **C–D.** *Stygnus* sp. male from Floresta Nacional do Jamari, Rondonia, Brazil. **E.** *Stygnus* cf. *simonis* Sørensen, 1932, female from San Martín de Amacayacu, Leticia, Amazonas, Colombia. **F.** *Stygnus* sp., female from Igarapé-Miri, Pará, Brazil. Photos by Leonardo Carvalho (A, C–D, F); Arthur Anker (B, E).

Sparassidae) has been documented in Brazil, Colombia and Ecuador (Rheims 2013), specifically within the Caquetá moist forests NT0107, Napo moist forest NT0142, Uatuma-Trombetas moist forests NT0173, Japurá-Solimões-Negro moist forests NT0132, Juruá-Purus moist forests NT0133 and the Southwest Amazon moist forests NT0166. Similarly, *Chactopsis insignis* (Scorpiones: Chactidae) has been observed in Brazil, Colombia and Peru (Flórez 2014), with occurrences in the Solimões-Japurá moist forests NT0163. Harvestmen, represented by *Taito* spp. (Opiliones: Cosmetidae), also contributed to this shared element, exhibiting a distribution across Brazil, Colombia, Ecuador and Peru (Kury & Barros 2014), spanning regions such as the Caquetá moist forests (NT0107), Solimões-Japurá moist forests (NT0163),



Fig. 11. *Stygnus* spp., live specimens. **A.** *Stygnus* sp. male from Igarapé-Miri, Pará, Brazil. **B.** *Stygnus* sp., female from close to Manaus (between Juma and Mamori), Brazil. **C–D.** *Stygnus* sp., female from Marabá, Pará, Brazil. **E–F.** *Stygnus* sp., male from Floresta Nacional do Ubajara, Ceará, Brazil. Photos by Leonardo Carvalho (A, C–F); Arthur Anker (B).

Table 2. Species of *Stygnus* Perty, 1833 recorded for the Colombian departments, and new records.

Biogeographic region	Department	Species of Opiliones recorded	Species of <i>Stygnus</i> recorded	Nominal species of <i>Stygnus</i> newly recorded	<i>Stygnus</i> sp. new records
Amazonas	Guainía	0	0	0	2
	Guaviare	0	0	2	0
	Vaupés	2	0	3	0
	Caquetá	1	0	0	0
	Putumayo	6	2	0	0
	Amazonas	9	0	1	0
Andes	Cundinamarca	38	0	1	0
	Meta	7	0	1	0
Caribbean	Magdalena	5	0	0	0

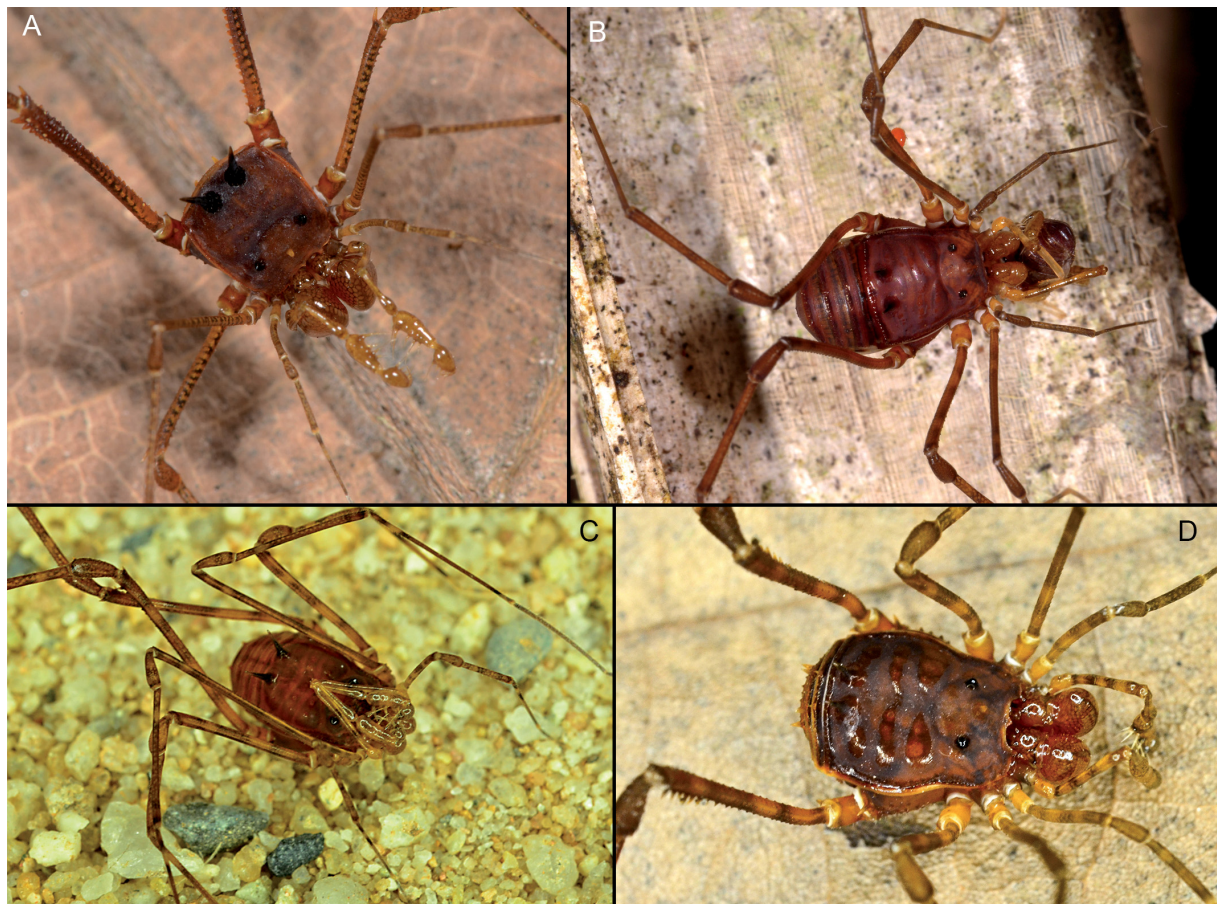


Fig. 12. *Stygnus* spp., live specimens. **A.** *Stygnus* sp., male from Parque Nacional Manu, Madre de Dios, Peru. **B.** *Stygnus* sp., female from close to Manaus (between Juma and Mamori), Amazonas, Brazil. **C.** *Stygnus* sp., female from Pousada, Recanto dos Pássaros, Amazonas, Brazil. **D.** *Stygnus* sp., male from Marabá, Pará, Brazil. Photos by Arthur Anker (A–B); Leonardo Carvalho (C–D).

Table 3 (continued on next page). Terrestrial ecoregions inhabited by the species of the genus *Stygnus* Perty, 1833 of the Colombian and Brazilian Amazon region.

Terrestrial ecoregions	Species						
	<i>Stygnus apaporis</i>	<i>Stygnus kuryi</i>	<i>Stygnus nogueirai</i>	<i>Stygnus simonis</i>	<i>Stygnus simplex</i>	<i>Stygnus pectinipes</i>	<i>Stygnus luteus</i>
Ucayali moist forests (NT0174)							
Iquitos varzea (NT0128)							
Caquetá moist forests (NT0107)	X	X	X		X		
Negro-Branco moist forests (NT0143)						X	
Napo moist forests (NT0142)					X	X	
Marajó várzea (NT0138)							
Purus varzea (NT0156)		X					
Solimões-Japurá moist forests (NT0163)				X			
Japurá-Solimoes-Negro moist forests (NT0132)			X			X	
Madeira-Tapajós moist forests (NT0135)							
Guianan savanna (NT0707)							X
Monte Alegre varzea (NT0141)							X
Uatuma-Trombetas moist forests (NT0173)							X
Xingu-Tocantins-Araguaia moist forests (NT0180)							X
Southwest Amazon moist forests (NT0166)						X	
Tocatins-Madeira moist forest (NT 0170)							X
Purus-Madeira moist forests (NT0157)							

Table 3 (continued). Terrestrial ecoregions inhabited by the species of the genus *Stygnus* Perty, 1833 of the Colombian and Brazilian Amazon region.

Terrestrial ecoregions	Species					<i>Stygnus</i> sp. 1 (Vaupés, Colombia)	<i>Stygnus</i> sp. 2 (FN Jamari)*	<i>Stygnus</i> sp. 3 (Igarape)*	<i>Stygnus</i> sp. 4 (Maraba)*	<i>Stygnus</i> sp. 5 (Juma and Mamori)*
	<i>Stygnus marthae</i>	<i>Stygnus heliae</i>	<i>Stygnus klugi</i>	<i>Stygnus</i> cf. <i>simonis</i>						
Ucayali moist forests (NT0174)			X							
Iquitos varzea (NT0128)			X							
Caquetá moist forests (NT0107)										
Negro-Branco moist forests (NT0143)					X					
Napo moist forests (NT0142)										
Marajó várzea (NT0138)										
Purus varzea (NT0156)				X						
Solimões-Japurá moist forests (NT0163)										
Japurá-Solimoes-Negro moist forests (NT0132)										
Madeira-Tapajós moist forests (NT0135)	X	X						X		
Guianan savanna (NT0707)										
Monte Alegre varzea (NT0141)										
Uatuma-Trombetas moist forests (NT0173)										
Xingu-Tocantins-Araguaia moist forests (NT0180)									X	X
Southwest Amazon moist forests (NT0166)										
Tocatins-Madeira moist forest (NTXX)								X		
Purus-Madeira moist forests (NT0157)										X

* Photographic records from Brazil.

Napo moist forest (NT0142), Purus-Madeira moist forests (NT0157), Southwest Amazon moist forests NT0166, Madeira-Tapajós moist forests NT0135 and the Juruá-Purus moist forests NT013. Additionally, *Ampycus telifer* (Butler, 1873) (Opiliones: Gonyleptidae) is present in both Brazil and Colombia (García 2014), primarily within the Solimões-Japurá moist forests (NT0163). Furthermore, this shared faunal elements extends to diplopods, exemplified by *Tuberodesmus* spp. (Polydesmida: Chelodesmidae), observed in Colombia and Ecuador (Shelley 1981), though they are always associated with the Napo moist forest (NT0142). Notably, the genus *Stygnus* exhibits a distribution closely associated with the Amazon subregion, as outlined in Morrone (2001), encompassing several WWF biogeographic regions.

Several studies have highlighted the notable degree of endemism within Neotropical opilionofauna (e.g., Pinto-da-Rocha *et al.* 2005; Arroyo-Peres *et al.* 2017), proposing them as valuable models for biogeographic research. However, our examination of the distribution of species of *Stygnus* suggests a comparatively reduced level of endemism among Amazonian species, reflected in the largest distribution and the largest number of biogeographic regions in which its presence is recorded. This observation is illustrated by the distribution of species such as *S. nogueirai* (Fig. 6), documented in both Brazil and Colombia with a geographical separation of about 600 kilometers between the two recorded localities.

This finding is consistent with parallel observations made for other harvestmen taxa occurring within the Amazonas and Guyana shield regions. For instance, within the Stygnidae, the genus *Eutimesius* Roewer, 1913 (Stygnidae) displays a mix of short-range endemic Andean species and the widespread *E. simoni* Roewer, 1913, within the Amazon region, as reported by (Pinto-da-Rocha 1997; Villarreal *et al.* 2024). Similarly, *Stenostygnus* Simon, 1879 (Biantidae: Stenostygninae) has demonstrated a comparable distribution pattern (Mamani *et al.* 2021). Additionally, the ampycid *Ampycus telifer* (Butler, 1873) (Opiliones: Ampycidae) has been recorded in both the Colombian and Brazilian Amazonian regions (García 2014), whereas “*Paecilaema*” *sexlineatum* Goodnight & Goodnight, 1942, has been identified in Guyana and Venezuela (Villarreal *et al.* 2021a). Finally, the cosmetid *Sibambea cincta* (Perty, 1833) has been recorded from localities within Brazilian, Colombian and Peruvian regions (Medrano *et al.* 2021). This shared pattern further substantiates our observation of decreased endemism within the Amazonian harvestmen populations, specifically the genus *Stygnus*.

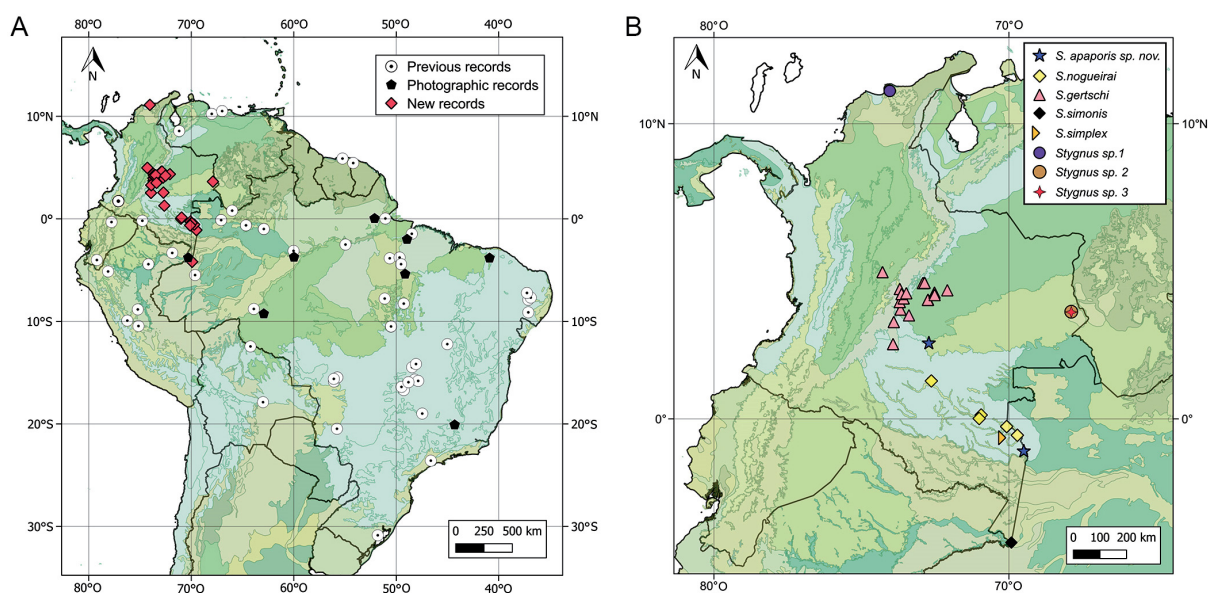


Fig. 13. Maps showing the geographical distribution of the genus *Stygnus* Perty, 1833. **A.** Previous records in the literature and photographic records. **B.** New records for Colombia.

Rows of tubercles on the legs

In Opiliones, the tubercles of the legs have been extensively utilized as a taxonomic trait, even showing a phylogenetic footprint (Pinto-da-Rocha 1997; Hara *et al.* 2010); however, these tubercles have received limited attention within a standardized nomenclatural framework. Certain authors have merely noted the number of rows (e.g., Tsurusaki *et al.* 2000) or mentioned some rows descriptively (e.g., Acosta 2006; Kury 2008; García & Kury 2017; García & Ahumada-C. 2018). Concerning the Gonyleptoidea Sundevall, 1833, the establishment of nomenclatural conventions can be traced back to Hara *et al.* (2010) and DaSilva & Gnaspini (2010), who identified six longitudinal rows of tubercles on the legs of Gonyleptidae. This initial proposal has subsequently been adopted by other researchers (e.g., Hara 2016; Carvalho & Kury 2018; Ázara & Kury 2019). While describing the new species *Stygnus apaporis* sp. nov., we identified a previously undocumented longitudinal row of tubercles on the legs, herein named as the “prolateral row” (Fig. 3). Notably, Villarreal *et al.* (2021b) described seven rows of tubercles on the femur of *Jime praecursor* Villarreal, Kury & Colmenares, 2021; therefore, this character likely exists in other species of stygnid.

We draw attention to the quantification of discernible rows, underscoring the necessity for a comparative analysis that includes other malleate harvestmen families – specifically Agoristenidae Šilhavý, 1973, Gerdesiidae Bragagnolo, Hara & Pinto-da-Rocha, 2015 and Cryptogeobiidae Kury, 2014. Such an analysis is crucial for understanding the evolutionary trajectory of this specific character within the broader framework of Gonyleptoidea.

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