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## FOUR NEW SPECIES OF LITTER INHABITING *SCYTODES* SPIDERS (ARANEAE, SCYTODIDAE) FROM AMAZONIA

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### ABSTRACT

Four new species of spitting spiders of the genus *Scytodes* are described: *S. panguana* from Peruvian Amazonia and *S. paarmanni*, *S. martiusi* and *S. janauari* from central Amazonia in Brazil. All are small, short legged scytodids. The specimens were collected in the course of ecological studies in the leaf litter layer on the ground of Amazonian terra firme forests.

**KEYWORDS:** *Scytodes*, Scytodidae, Araneae, ground spiders, litter fauna, Amazonia, Brazil, Peru.

### RESUMO

Quatro novas espécies de *Scytodes* são descritas: *S. panguana* da Amazônia peruana e *S. paarmanni*, *S. martiusi* e *S. janauari* da Amazônia central do Brasil. Todas são espécies pequenas, de pernas curtas, que foram coletadas durante estudos ecológicos em liteira no chão de florestas de terra firme da Amazônia.

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### INTRODUCTION

Spiders of the genus *Scytodes* Latreille are remarkable for their characteristic hunting strategy, spitting a sticky substance on their prey through external openings at the basis of the fang of the chelicerae (Monterosso, 1928; Bristowe, 1931; McAlister, 1960; Kas-ton, 1965; Nentwig, 1985).

About 45 species from the Neotropical Region were described to date (Roewer, 1954; Brignoli, 1983; Platnick, 1989, 1993). Usually more attention has been given to sample the larger, long legged species. Spiders frequently found in the ground litter

layer in forests were apparently neglected due to their small size, generally not exceeding 2.0 mm, and because of the general rareness of systematic collections of litter inhabiting fauna. Some exceptions can be found in Alayón (1977) and Valerio (1981). These authors described two small species of less than 3.0 mm of body length, *Scytodes lorenzoi* Alayón from Cuba and *S. diminuta* Valerio from Costa Rica.

In this paper we describe four new species of tiny short legged scytodids, all measuring between 1.10 to 1.90 mm of body length. The species on which we report here seem to live exclusively in the litter layer of non inundated ("terra firme") Amazonian rain forests. During intensive long term sampling in neighboring inundation forests (Höfer, 1990) none of them occurred in traps or litter samples, but *Scytodes championi* F.O.P.-Cambridge lives there in higher strata.

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## MATERIALS AND METHODS

Three of the herein described species were collected by traps in forests near Manaus, Amazonas (Adis & Schubart, 1984; Adis, 1988; Höfer & Beck, 1996) in the course of ecological projects, and the fourth species was sampled near Panguana Biological Station, Rio Yuyapichis, Peru, in an extensive ant study (description of the study area and other faunistic results: Verhaagh, 1989, 1991; Römbke & Verhaagh, 1992; Hutterer et al., 1995).

The material belongs to the following collections: IBSP, Instituto Butantan, São Paulo, Brazil (A.D. Brescovit); INPA, Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (C. Magalhães); MCN, Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, Brazil (E.H. Buckup); MUSM, Museo de Historia Natural, Universidad Mayor de San Marcos, Lima, Peru (D. Silva D.); SMNK, Staatliches Museum für Naturkunde, Karlsruhe, Germany (H. Höfer).

Descriptions and terminology basically follow Valerio (1981). The epigyna were submerged in clove oil to study internal structures. Micrographs were obtained with a scanning electron microscope (type JEOL JSM 840A) in the Laboratório de Microscopia Eletrônica, Instituto de Física, Universidade de São Paulo (USP).

## RESULTS

### *Scytodes panguana* new species

(Figs. 1–9, 13a,b; 17a-c)

#### Etymology

The specific name is a noun in apposition taken from the type locality.

#### Diagnosis

*Scytodes panguana* resembles *S. janauari* by the bifurcated distal area of the embolus in the male palp and the small seminal receptacles of the female epigynum, but differs by equally long distal prongs (Figs. 8, 9, 17a) in the palp and by the foveae separated from each other by little more than their width (Fig. 17c) in the epigynum.

#### Description

♂ holotype: carapace yellow with gray brownish bands occupying almost the whole lateral margins

and with scattered black stripes behind the lateral diads and the posterior median region (Fig. 13a). Pedipalps yellowish. Labium and endites pale brown. Sternum white with central area and margins brown. Legs yellow with transversal brown bands, except on tarsi. Abdomen as in *S. paarmanni*.

Total length 1.15 mm. Carapace slightly arched, 0.65 mm long, 0.55 mm wide. Eye diameters: PME 0.06 mm, ALE 0.05 mm, PLE 0.06 mm, the lateral eyes on a tubercle. Chelicerae with subapical hyaline keel. Labium 0.08 mm long, 0.15 mm wide. Sternum 0.35 mm long, 0.32 mm wide, with short projections next to coxae I-IV.

Legs short, measurements: I – femur 0.52 mm/ patella 0.30 mm/ tibia 0.55 mm/ metatarsus 0.45 mm/ tarsus 0.17 mm/ total 1.99 mm/ II – 0.45/ 0.20/ 0.40/ 0.35/ 0.12/ 1.52 mm/ III – 0.35/ 0.17/ 0.25/ 0.27/ 0.10/ 1.04 mm/ IV – 0.45/ 0.20/ 0.40/ 0.40/ 0.12/ 1.57 mm. Trichobothria with very long trichoma, bothrium with semicircular smooth rim (Fig. 1). Femora dorsally with feathery hairs (Fig. 3). Tarsi with two claws, each bearing three long teeth (Fig. 2). Palpal femur with narrow stridulatory hump presenting a rounded and projecting socket (Fig. 7). Cymbium with a long and slender distal spine (Fig. 6). Bulb 0.47 mm long, medially laced (Figs. 8, 9, 17a). The distal area (Fig. 17b) presents a hyaline lamina (collapsed in Figs. 8, 9) accompanying the two prongs (Figs. 17a, b). Abdomen 0.50 mm long, 0.45 mm wide, rounded, covered with large feathery hairs (Figs. 4-5).

♀ allotype: coloration similar to that of ♂, but darker (Fig. 13b).

Total length 1.30 mm. Carapace as in ♂, 0.65 mm long, 0.57 mm wide. Eye diameters: PME 0.06 mm, ALE 0.05 mm, PLE 0.06 mm. Chelicerae as in ♂. Labium 0.08 mm long, 0.12 mm wide. Sternum 0.35 mm long, 0.32 mm wide, as in ♂.

Leg measurements: I – femur 0.50 mm/ patella 0.15 mm/ tibia 0.52 mm/ metatarsus 0.42 mm/ tarsus 0.15 mm/ total 1.74 mm/ II – 0.45/ 0.20/ 0.40/ 0.40/ 0.12/ 1.57 mm/ III – 0.42/ 0.17/ 0.27/ 0.32/ 0.15/ 1.33 mm/ IV – 0.47/ 0.15/ 0.45/ 0.47/ 0.12/ 1.66 mm. Abdomen 0.60 mm long, 0.55 mm wide, as in ♂. Genitalia with strongly curved pedicels of seminal receptacles. Positioning ridge short and curved. Foveae present and separated from each other by little more than their width (Fig. 17c).

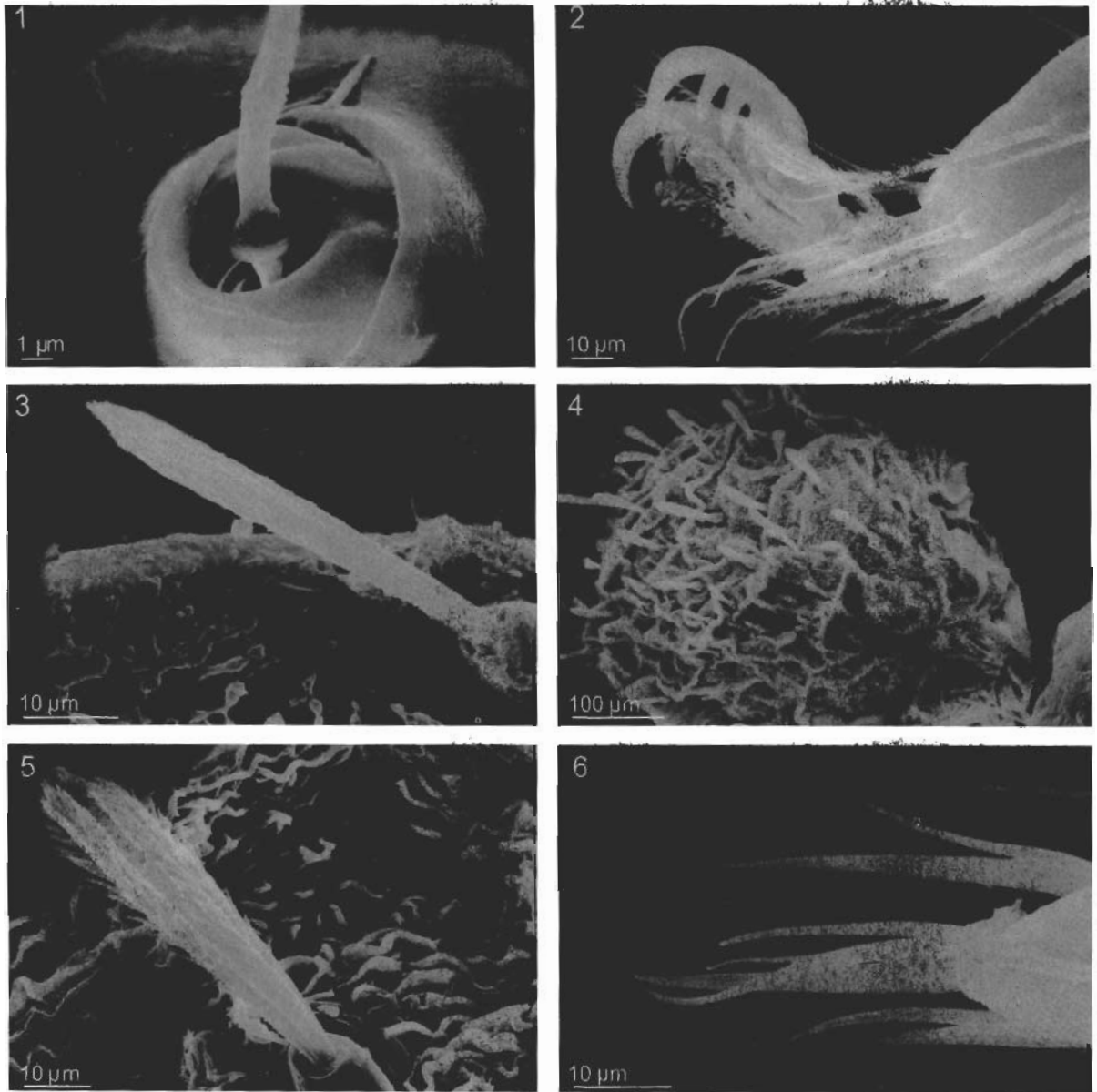


Plate 1. *Scytodes panguana* new species, ♂: Fig. 1. Trichobothria from leg I; Fig. 2. Apex of left tarsus I, lateral; Fig. 3. Feathery hair of femur I; Fig. 4. ♀, abdomen, dorsal; Fig. 5. Feathery hairs of abdomen; Fig. 6. Cymbium, distally.

### Variation

Fifteen ♂♂: total length 1.10 – 1.30 mm; ten ♀♀: total length 1.20 – 1.50 mm. Some ♀♀ present a totally black abdomen and brown sternum.

### Natural History

Specimens have been collected with pitfall traps in a variety of habitats around the Biological Station of Panguana, such as primary forest, secondary forest, grass and kudzu (*Pueraria phaseoloides*) pastures,

small mixed plantations (chacras) and even riverine vegetation which is, however, rarely and only for short periods inundated.

### Distribution

Panguana, Peru.

### Types

♂ holotype from Rio Yuyapichis (09°37'S, 74°56'W), Panguana Biological Station, Huánuco,

Peru, Aug. 8–Sept. 9, 1984, M. Verhaagh col., deposited in MUSM; ♀ allotype same locality and collector, Jan. 11–Febr. 18, 1984, in MUSM; paratypes: ♂, Dec. 24, 1983–Jan. 21, 1984, IBSP 13046; ♀, Oct. 29–Nov. 26, 1983, IBSP 13045; ♂, Nov. 26–Dec. 24, 1983, SMNK; ♀, Jan. 21–Febr. 18, 1984, SMNK; ♂ and ♀, Jan. 21–Febr. 18, 1984, MCN 30738; ♂, Dec. 24, 1983–Jan. 21, 1984, IBSP 13048; ♀, Febr. 26–Dec. 24, 1983, IBSP 13047; all collected at the same locality as the holotype by M. Verhaagh.

#### Other material examined

Peru, Huánuco, Panguana Biological Station, Río Yuyapichis (09°37'S, 74°56'W), 3 ♂♂ and 3 ♀♀, July 30, 1983–July 02, 1984 (IBSP 13049–13053); 17 ♂♂, 9 ♀♀ and 1 immature, Oct. 29, 1983–Febr. 18, 1984 (SMNK), all collected with pitfall traps by M. Verhaagh.

#### *Scytodes paarmanni* new species

(Figs. 10, 14a, b; 18a–c)

#### Etymology

The specific name is a patronym in honor of the collector of one paratype.

#### Diagnosis

*Scytodes paarmanni* is distinguished from other species by presenting the male palpal bulb narrowed medially and flattened laterally, with an oval median ventral notch in the distal area (Figs. 10, 18a, b) and by the female genitalia with the positioning ridges appearing like an inverted comma and seminal receptacles with sinuous pedicels (Fig. 18c).

#### Description

♂ holotype: carapace yellow gray, with a black pattern on the lateral margins and the paramedian area marked by black stripes, one behind of lateral diads and others forming an "H" median dorsally (Fig. 14a). Chelicerae yellow with a gray frontal spot. Endites and labium white. Sternum white, with orange margin and transversal brown stripes. Femur and patella of legs yellowish, tibia, metatarsus and tarsus orange. Femur, patella and tibia with gray stripes in the median and basal parts, absent on metatarsus and tarsus. Abdomen cream with gray longitudinal bands dorsally and white ventrally.

Total length 1.12 mm. Carapace strongly arched, 0.65 mm long, 0.60 mm wide. Eye diameters: PME 0.06 mm, ALE 0.05 mm, PLE 0.06 mm. Chelicerae with a subapical hyaline keel. Labium 0.17 mm long, 0.22 mm wide. Sternum 0.32 mm long, 0.32 mm wide, largest near coxa II.

Legs short, measurements: I – femur 0.55 mm/ patella 0.17 mm/ tibia 0.60 mm/ metatarsus 0.50 mm/ tarsus 0.17 mm/ total 1.99 mm/ II – 0.45/ 0.17/ 0.37/ 0.42/ 0.12/ 1.53 mm/ III – 0.32/ 0.15/ 0.27/ 0.32/ 0.12/ 1.18 mm/ IV – 0.47/ 0.20/ 0.40/ 0.45/ 0.15/ 1.67 mm. Bulb 0.50 mm long, rounded distally (Figs. 10; 18) and presenting a longitudinal lateral ridge. Abdomen 0.45 mm long, 0.42 mm wide, rounded, covered by a great number of feathery hairs, as in *S. panguana*.

♀ allotype: coloration with the basic pattern presented by ♂♂, but carapace and dorsal area of abdomen darker (Fig. 14b).

Total length 1.35 mm. Carapace as in ♂, 0.75 mm long, 0.62 mm wide. Eye diameters: PME 0.06 mm, ALE 0.05 mm, PLE 0.05 mm. Chelicerae as in ♂. Labium 0.17 mm long, 0.22 mm wide. Sternum 0.35 mm long, 0.32 mm wide, as in ♂.

Leg measurements: I – femur 0.60 mm/ patella 0.17 mm/ tibia 0.50 mm/ metatarsus 0.47 mm/ tarsus 0.15 mm/ total 1.89 mm/ II – 0.50/ 0.17/ 0.37/ 0.40/ 0.12/ 1.56 mm/ III – 0.42/ 0.17/ 0.27/ 0.30/ 0.12/ 1.28 mm/ IV – 0.47/ 0.17/ 0.42/ 0.42/ 0.17/ 1.65 mm. Abdomen 0.57 mm long, 0.55 mm wide, rounded and covered by hairs as in ♂. Genitalia with positioning ridges. Foveae present (Fig. 18c).

#### Variation

Two ♂♂: total length 1.12 – 1.17 mm; three ♀♀: total length 1.22 – 1.35 mm. ♂♂ can be as dark as ♀♀.

#### Distribution

Central Amazonia, Brazil.

#### Material examined

##### Types

♂ holotype and ♀ allotype and four immature paratypes from Reserva Ducke, Manaus, Amazonas, Brazil, Aug. 20, 1991, A.D. Brescovit col., deposited in MCN 21364; paratypes: ♂ and ♀, with same data of holotype, in IBSP 13039; ♂ from the same locality, Sept. 17, 1992, W. Paarmann col., in INPA.

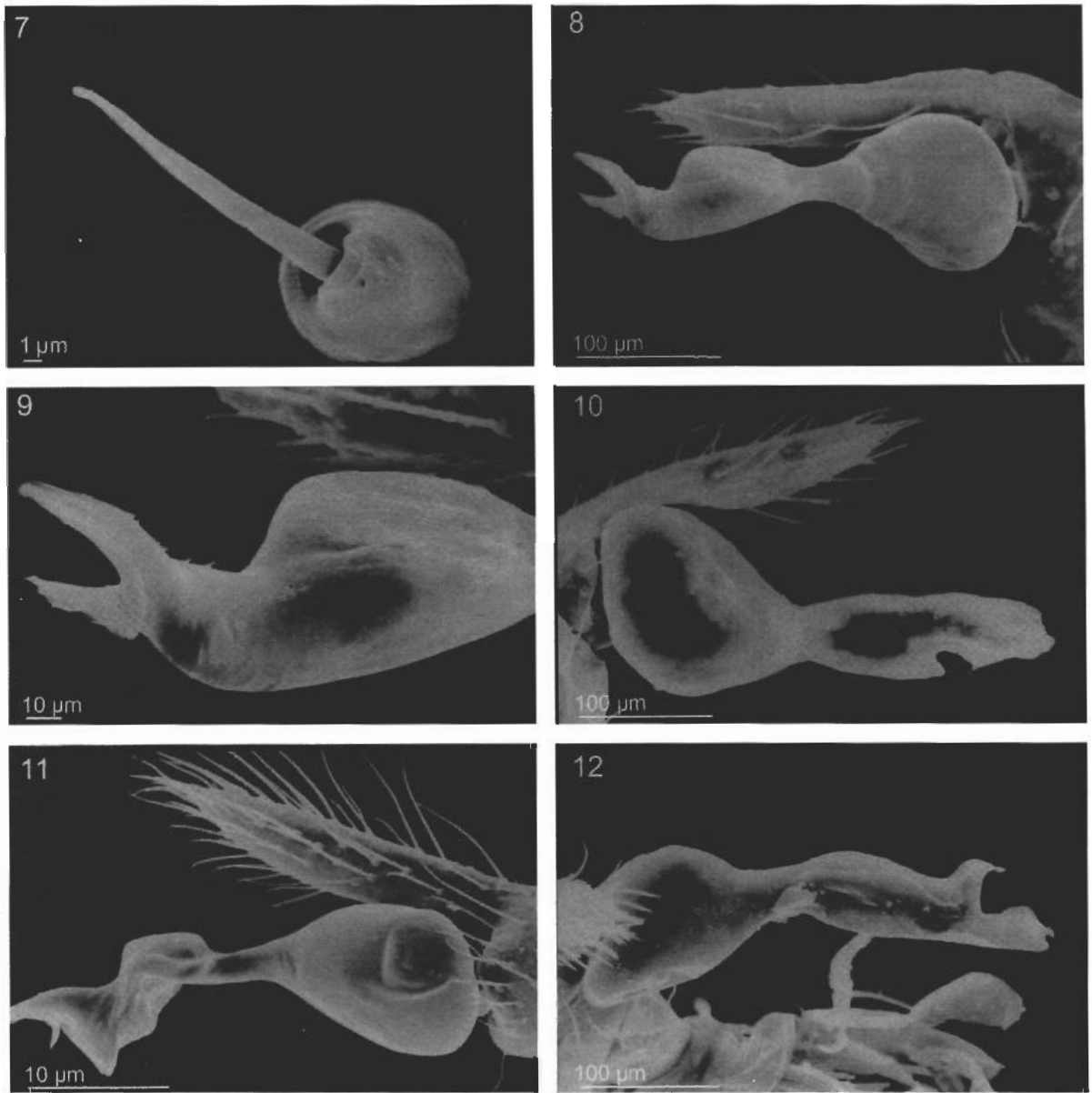


Plate II. *Scytodes panguana* new species, ♂: Fig. 7. Stridulatory hump of palpal femur, dorsal; Fig. 8. ♂ left palp; Fig. 9. distal area of bulb, prolateral view; Fig. 10. *Scytodes paarmanni* new species, ♂ left palp, retrolateral view; Fig. 11. *Scytodes martiusi* new species, ♂ left palp, retrolateral view; Fig. 12. *Scytodes janauari* new species, ♂ left palp, retrolateral view.

*Scytodes martiusi* new species  
(Figs. 11, 15, 19a-c)

#### Etymology

The specific name is a patronym in honor of the collector of the allotype.

#### Diagnosis

*Scytodes martiusi* differs from other species by having the male palpal embolus enlarged and twisted

distally (Figs. 11; 19a, b) and the female with foveae close to each other and the large seminal receptacles with slightly curved pedicels (Fig. 19c).

#### Description

♂ (IBSP 13040): carapace orange, with large median dorsal area white and lateral margins gray with narrow and elongated stripes projected to the center of dorsum (Fig. 15). Clypeus black. Chelicerae yellow with frontal area gray. Endites, labium and sternum

white. Legs orange with bases of articles yellow, except on the metatarsi and tarsi. Abdomen gray dorsally and white on lateral margins and on venter.

Total length 1.90 mm. Carapace very strongly arched, 0.90 mm long, 0.80 mm wide. Eye diameters: PME 0.11 mm, ALE 0.10 mm, PLE 0.11 mm. Chelicerae with subapical hyaline keel. Labium 0.08 mm long, 0.12 mm wide. Sternum 0.44 mm long, 0.40 mm wide, hairy and without grooves or projections.

Short legs, measurements: I – femur 1.20 mm/ patella 0.25 mm/ tibia 1.27 mm/ metatarsus 1.40 mm/ tarsus 0.22 mm/ total 4.04/ II – 0.95/ 0.22/ 0.92/ 1.02/ 0.20/ 3.31 mm/ III – 0.70/ 0.22/ 0.52/ 0.67/ 0.17/ 2.28 mm/ IV – 0.95/ 0.27/ 0.85/ 0.85/ 0.20/ 3.12 mm. Cymbium with a long and slender spine at tip (Fig. 19a,b). Bulb 0.74 mm long, abruptly narrowed medially (Figs. 11; 19a, b), with a short tooth near the

embolus opening (Figs. 11, 19a). Abdomen 1.00 mm long, 0.80 mm wide, oval, covered by long simple hairs.

♀ (IBSP 13041): coloration with the basic pattern presented by ♂♂, except margins of carapace black and legs totally orange.

Total length 1.85 mm. Carapace as in ♂, 0.80 mm long, 0.75 mm wide. Eye diameters: PME 0.06 mm, ALE 0.06 mm, PLE 0.06 mm. Chelicerae as in ♂. Labium 0.10 mm long, 0.12 mm wide. Sternum 0.40 mm long, 0.37 mm wide.

Leg measurements: I – femur 0.70 mm/ patella 0.20 mm/ tibia 0.67 mm/ metatarsus 0.77 mm/ tarsus 0.20 mm/ total 2.54 mm/ II – 0.62/ 0.20/ 0.55/ 0.60/ 0.17/ 2.14 mm/ III – 0.50/ 0.22/ 0.35/ 0.40/ 0.15/ 1.62 mm/ IV – 0.70/ 0.25/ 0.55/ 0.60/ 0.20/ 2.30 mm. Abdomen 1.0 mm long, 0.95 mm wide, as in ♂. Genitalia with curved positioning ridges (Fig. 19c).

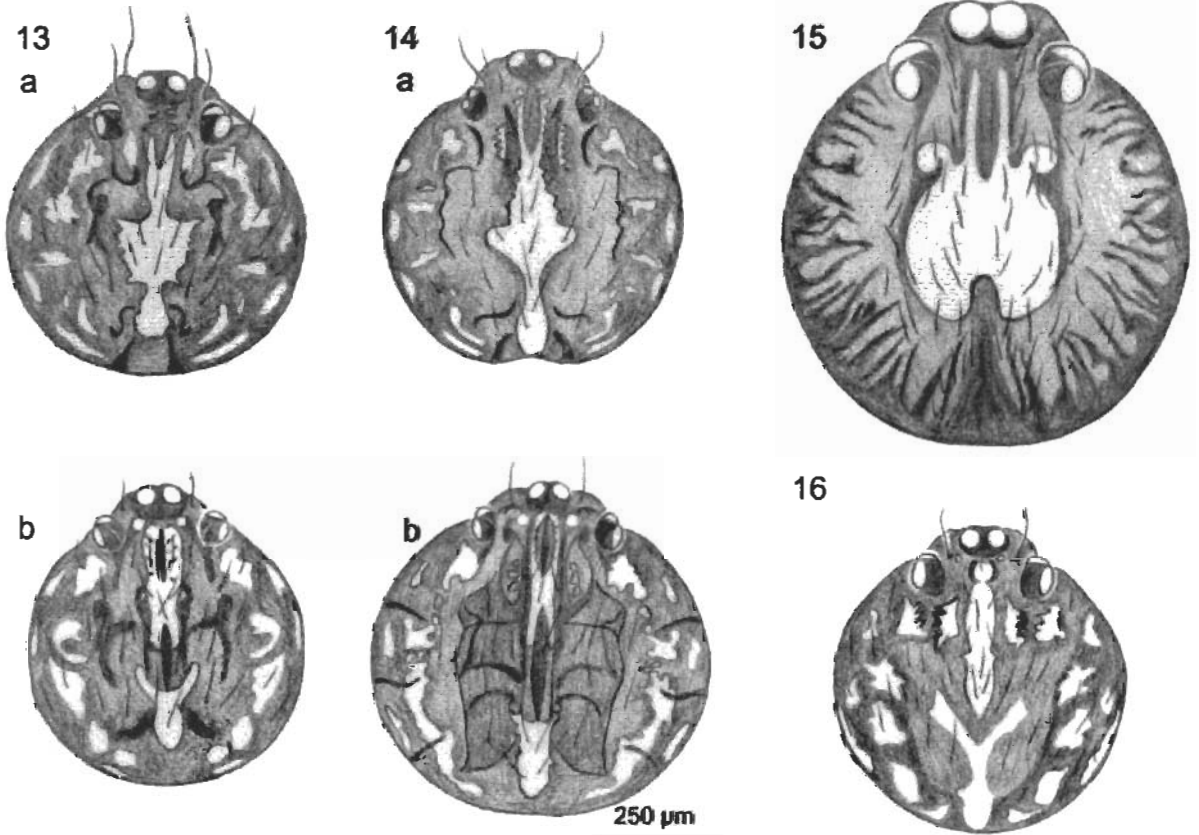


Plate III. Carapace, dorsal view: Fig. 13. *S. panguana* new species a – ♂, b – ♀; Fig. 14. *S. paarmanni* new species a – ♂ b – ♀; Fig. 15. *S. martiusi* new species, ♂; 16. *S. janauari* new species, ♂.

**Variation**

Three ♂♂: total length 1.60 – 1.90 mm; two ♀♀: total length 1.80 – 1.85 mm.

**Distribution**

Central Amazonia, Brazil.

**Material examined****Types**

♂ holotype from Reserva Ducke, Manaus, Amazonas, Brazil, May 11, 1992, T. Gasnier & H. Höfer col., deposited in INPA; ♀ allotype from the same locality, Apr. 4, 1994, C. Martius col., in INPA; paratypes: ♂ and ♀ from the same locality and date of holotype, Apr. 13-20, 1992, in IBSP 13040; 13041; two ♂♂, from a secondary terra firme forest at Rio Taramã-Mirím, Manaus, Amazonas, Brazil, Sept. 15-Oct. 01, 1982, J. Adis col., in SMNK 274; 275.

***Scytodes janauari* new species**

(Figs. 12, 16; 20a-c)

**Etymology**

The specific name is a noun in apposition taken from the type locality.

**Diagnosis**

*Scytodes janauari* resembles *S. panguana* by the bifurcated distal area of the male palpal bulb and the small seminal receptacles of the epigynum, but differs by presenting several prongs of different length in the male palpal embolus, the apical prong being longer and large and the basal one bifurcated (Figs. 12, 20a, b, inverted in Fig. 12) and by having the small seminal receptacles separated by three times the width of foveae (Fig. 20c) in the epigynum.

**Description**

♂ holotype: coloration of carapace as in *S. panguana* without presenting the dorsal black stripes (Fig. 16). Pedipalps yellow. Chelicerae white with frontal brown spots. Endites white. Sternum white with orange margins. Legs yellow with brown bands, except on metatarsi and tarsi, which are entirely orange. Abdomen dorsally gray and ventrally white.

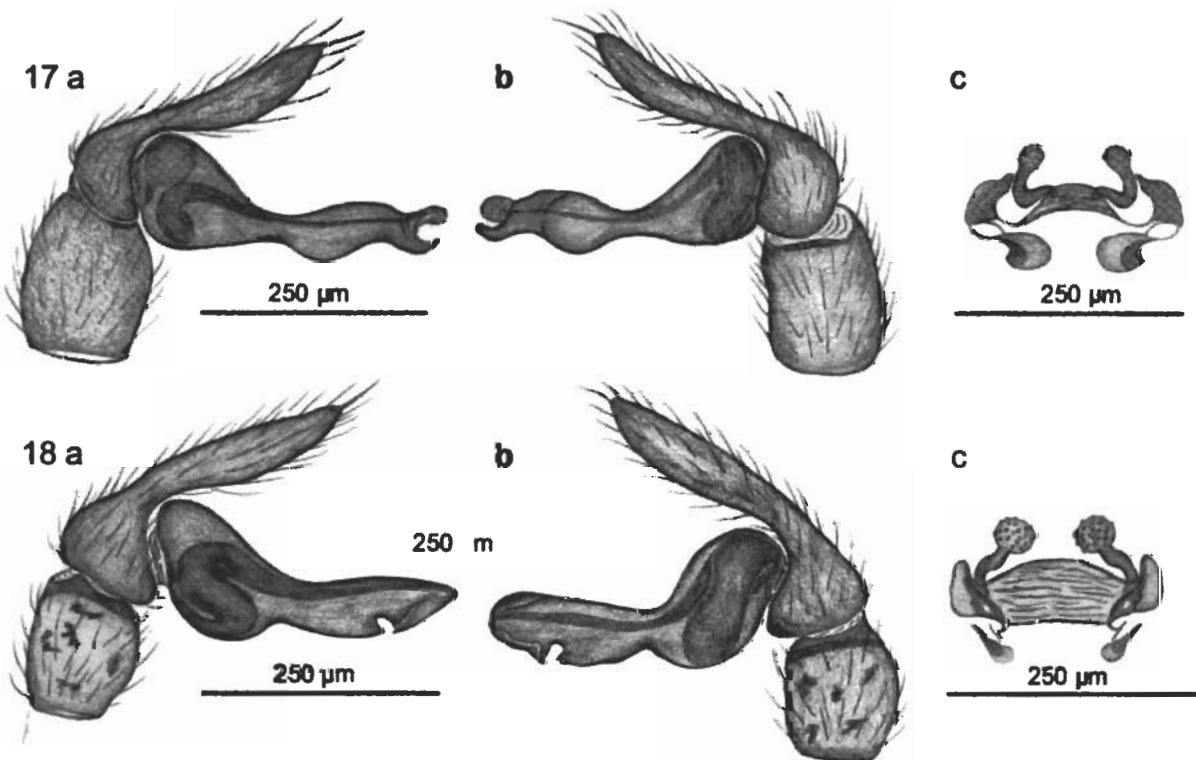


Plate IV. Fig. 17. *Scytodes panguana* new species, ♂ palp: a – retrolateral view; b – prolateral view, c – ♀ epigynum, dorsal view; Fig. 18. *S. paarmanni* new species, ♂ palp: a – retrolateral view; b – prolateral view; c – ♀ epigynum, dorsal view.

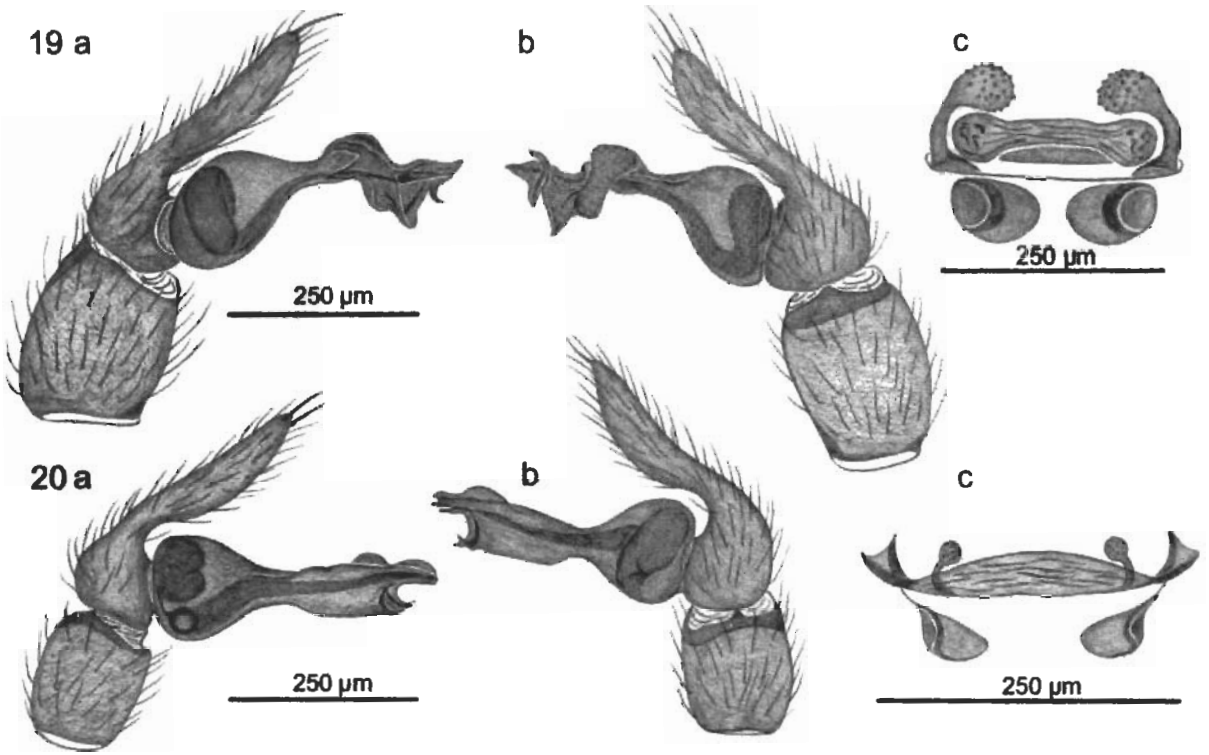


Plate V. Fig. 19. *Scytodes martiusi* new species, ♂ palp: a – retrolateral view; b – prolateral view; c – ♀ epigynum, dorsal view; Fig. 20. *S. janauari* new species, ♂ palp: a – retrolateral view; b – prolateral view; c – ♀ epigynum, dorsal view.

Total length 1.30 mm. Carapace strongly arched, 0.70 mm long, 0.60 mm wide. Eye diameters: PME 0.05 mm, ALE 0.06 mm, PLE 0.06 mm. Chelicerae with a subapical hyaline keel. Labium 0.10 mm long, 0.12 mm wide. Sternum 0.32 mm long, 0.47 mm wide, with short projections next to coxae I–IV.

Legs short, measurements: I – femur 0.57 mm/ patella 0.17 mm/ tibia 0.62 mm/ metatarsus 0.55 mm/ tarsus 0.20 mm/ total 2.13 mm/ II – 0.45/ 0.17/ 0.42/ 0.45/ 0.15/ 1.64 mm/ III – 0.37/ 0.12/ 0.30/ 0.37/ 0.15/ 1.31 mm/ IV – 0.47/ 0.20/ 0.47/ 0.50/ 0.15/ 1.79 mm. Bulb 0.41 mm long, weakly narrowed medially (Figs. 12; 20a). Abdomen 0.60 mm long, 0.55 mm wide, rounded, covered with feathery hairs.

♀ allotype: coloration darker than in ♂♂ and pedipalps and metatarsi of legs yellow with brown stripes, sternum yellowish.

Total length 1.55 mm. Carapace as in ♂, 0.70 mm long, 0.60 mm wide. Eye diameters: PME 0.05 mm, ALE 0.05 mm, PLE 0.05 mm. Chelicerae as in ♂. Labium 0.12 mm long, 0.12 mm wide. Sternum 0.37 mm long, 0.35 mm wide, as in ♂.

Leg measurements: I – femur 0.52 mm/ patella 0.17 mm/ tibia 0.55 mm/ metatarsus 0.50 mm/ tarsus 0.15 mm/ total 1.89 mm/ II – 0.45/ 0.17/ 0.42/ 0.45/ 0.15/ 1.64 mm/ III – 0.40/ 0.15/ 0.30/ 0.40/ 0.12/ 1.37 mm/ IV – 0.52/ 0.17/ 0.45/ 0.50/ 0.15/ 1.79 mm. Abdomen 0.75 mm long, 0.70 mm wide, as in ♂. Genitalia with pedicels of seminal receptacles curved. Positioning ridges sinuous. Foveae separated from each other by their width (Fig. 20c).

#### Variation

Three ♂♂: total length 1.25 – 1.40 mm; two ♀♀: total length 1.50 – 1.55 mm.

#### Distribution

Central Amazonia, Brazil.

#### Material examined

##### Types

♂ holotype and ♀ allotype from a secondary terra firme forest at Lago Janauari (03°20'S, 60°17'W), Manaus, Amazonas, Brazil, March 7, 1996, J. Adis et



al. col., deposited in INPA; paratypes: 2 ♂♂, ♀ and immature with same data, in IBSP 13042, 13043, 13044.

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