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ORIGINAL ARTICLE

A new species of *Drymusa* Simon, 1891 (Araneae: Drymusidae) from Chile

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Abstract
A new species of *Drymusa* Simon, 1891, from Region VII, Chile, is described and illustrated. The female genitalia is quite different from the other *Drymusa* species and even from most of the Scytodoidea, having two sclerotized sulci above the epigastric furrow that seemingly provide a guide for the embolus. The male copulatory bulb is also quite different from the other species, having a very long and flexible embolus. This Chilean species is the seventh species of *Drymusa* described from South America. The presence of a double row of teeth on the ventral surface of the proclaw and a single row on the retroclaw of legs I and II found on this and on other species of *Drymusa* provides further evidence to support the relationship between Drymusidae Simon, 1891, Periegopidae Simon, 1893 and Scytodidae Blackwall, 1864.

Keywords: Araneae, Chile, *Drymusa*, Drymusidae, Scytodoidea, taxonomy

Introduction

The genus *Drymusa* Simon, 1891 comprises 14 species described so far (Platnick, 2006). Of these, three occur in South Africa and the remaining 11 in the Neotropical region, mainly in Central America, including *D. nubila* Simon, 1891 from the Island of Saint Vincent, *D. simoni* Bryant, 1948 from Hispaniola, *D. dinora* Valerio, 1971 from Costa Rica, *D. armasi* Alayón García, 1981 and *D. spectata* Alayón García, 1981 from Cuba. The remaining six species are the only ones known from South America: *D. serrana* Goloboff & Ramirez, 1991 from Argentina, *D. canhemabae* Brescovit, Bonaldo & Rheims, 2004, *D. tobyi* Bonaldo, Rheims & Brescovit, 2006, *D. colligata* Bonaldo, Rheims & Brescovit, 2006, *D. spelunca* Bonaldo, Rheims & Brescovit, 2006 and *D. philomatica* Bonaldo, Rheims & Brescovit, 2006 from Brazil. The genus is seemingly well represented in South America, since Peréz González & Wienskoski (2005) reported two undescribed species from Venezuela.

Platnick et al. (1991) placed Drymusidae sister to Scytodidae due to the presence of a field of spicules on the median surface of the posterior median spinnerets, and placed Loxoscelidae as a junior synonym of the Sicariidae. Forster (1995) related Drymusidae to Scytodidae and Periegopidae based on the presence of a tracheal system consisting of a short median apodemal lobe and a distinct pair of simple lateral tracheae derived from the booklung atria (Lamy, 1902; Ramírez, 2000), and due the presence of a single spigot (presumably aciniform gland) on both the posterior lateral and posterior median spinnerets. Ramírez (2000) reexamined the respiratory system of haplogyne spiders and confirmed these results. Recently, Brescovit et al. (2004) further distinguished Drymusidae from Scytodidae by several plesiomorphic conditions, such as the slightly depressed body, the short and conical cymbium, and the lack of stridulatory pick on the palps and the corresponding ridges on the chelicerae.

In this paper we present the first record of the family Drymusidae in Chile, with the description of a new species from Los Queñes (Region VII).

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Material and methods

The type specimens are deposited in the Museo de Historia Natural, Santiago de Chile (MHNS, Ariel Camousseight), the remaining material is deposited in the arachnological collection of the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires (MACN-Ar, Cristina Scioscia) and in the American Museum of Natural History (AMNH, Norman Platnick). Male and female genitalia were observed in clove oil after dissection, with or without previous digestion with KOH. The drawings were made with camera lucida mounted on a stereoscopic compound microscope (Olympus BH-2); pictures were made with a digital camera (Nikon DXM1200) mounted on a stereoscopic microscope (Nikon SMZ1500), the focal planes composed with Helicon Focus 3.10.3 (http://helicon.com.ua/heliconfocus/); scanning electron micrographs were taken under high vacuum with a FEI XL30 TMP after critical-point drying and Au-Pd coating. Measurements are given in millimeters.

Results

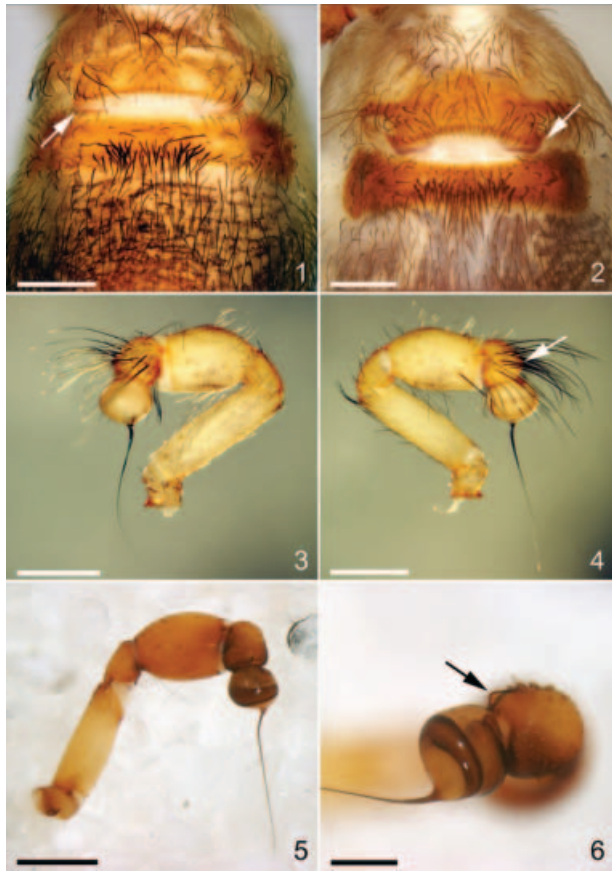
Drymusa rengan, sp. n. (Figures 1–43)

Types

Male holotype and female paratype from Chile, Region VII (Maule), Curicó Province, Los Queñes, 35°01′ S, 70°48′ W, 16 February 2005, F. M. Labarque and M. J. Ramírez coll., deposited in MHNS. Same data, 1♂ (MACN-Ar 11003) and 1♀ (MACN-Ar 10996) paratypes, deposited in MACN-Ar. Same locality, 17 October 1992, N. Platnick, P. Goloboff and K. Catley coll., 1♂ and 1♀ paratypes, deposited in AMNH.

Other material examined

Same data as the types, 3♂ (MACN-Ar 11005, 11007, 11009); one penultimate ♂ (MACN-Ar 10998); 4♀ (MACN-Ar 10811, 11000, 11002, 11008); one penultimate ♀ (MACN-Ar 10997); one immature (MACN-Ar 10936); 15 immature (MACN-Ar 10995); two immature (MACN-Ar 10999); five immature (MACN-Ar 11001); one immature (MACN-Ar 11004); one immature (MACN-Ar 11006); same locality, January 1984, P. Goloboff coll., one immature (MACN-Ar 11010); same locality, 17 October 1992, N. Platnick, P. Goloboff and K. Catley coll., one penultimate ♂ (AMNH); 4♀? (AMNH); one immature (AMNH).



Figures 1–6. *Drymusa rengan* n. sp. (1, 2) Female genitalia (1, paratype, MHNS; 2, paratype, AMNH), ventral view (arrow to sclerotized groove). (3–6) Male left palp: (3, 4) holotype, MHNS; (5, 6) paratype, AMNH; arrows to prolateral apophysis; (3) retrolateral; (4) prolateral; (5) prolateral, tarsi shaved; (6) same, frontal view. Scale bars: 0.5 mm (1–5); 0.25 mm (6).

Etymology

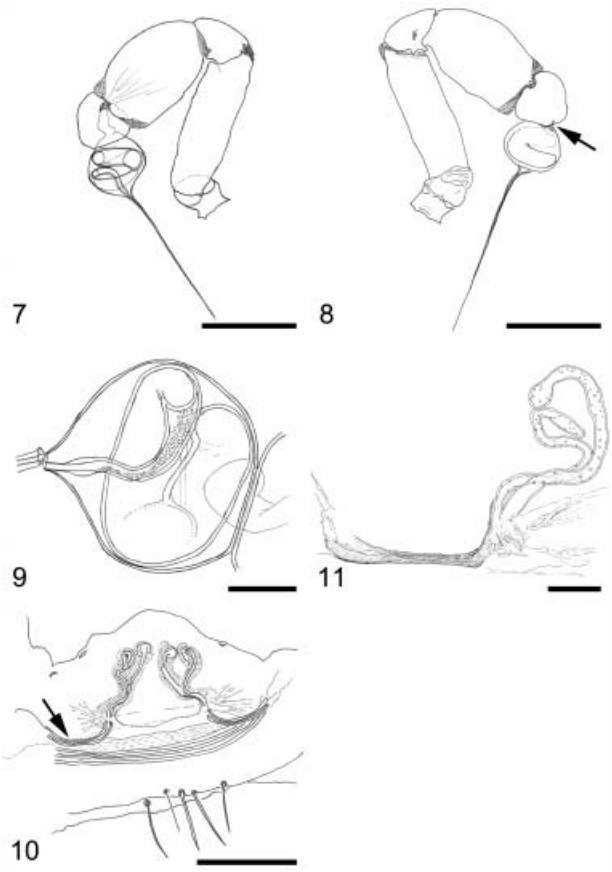
The specific name is a Mapuchean word that means "dig the earth", which was basically the way in which the specimens were collected.

Diagnosis

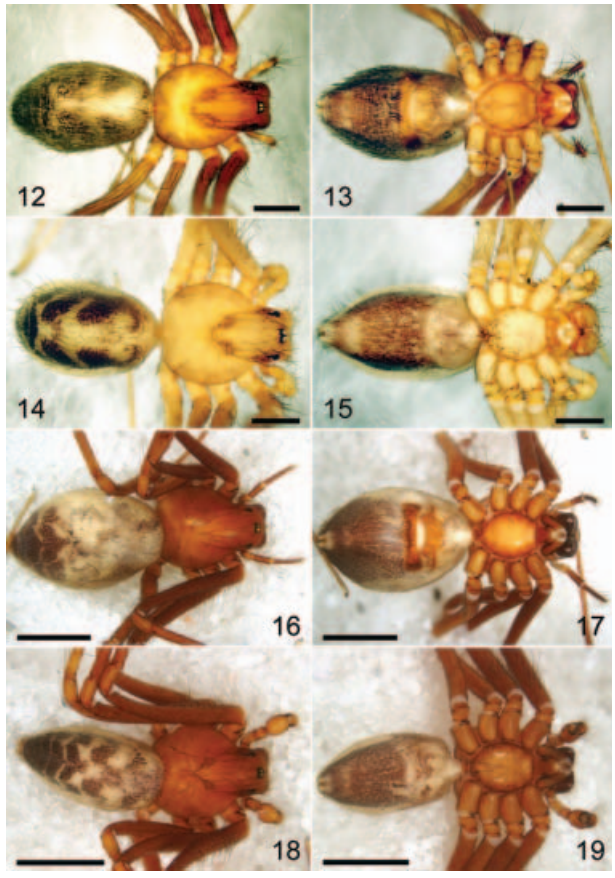
Males are distinguished from the congeneric species by the presence of a very long, thin and flexible embolus implanted retrolaterally on the copulatory bulb, and by the presence of a small apophysis on the promargin of the palp tarsi (Figures 3–9). Females are distinguished by the presence of two pairs of long, elongate spermathecae connected to the sclerotized grooves (Figures 1, 2, 10, 11, 22, 23).

Description

Male (holotype, MNHS). Carapace pale yellow, margins slightly darker, cephalic area with two

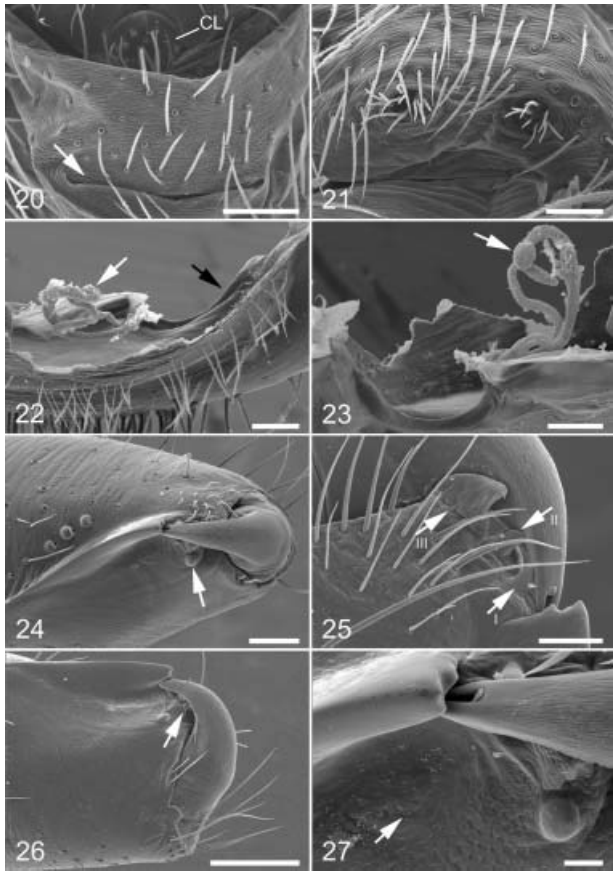


Figures 7–11. *Drymusa rengan* n. sp. (7–9) Male left palp (holotype, MHNS): (7) retrolateral; (8) prolateral (arrow to a small apophysis); (9) detail of the bulb, retrolateral view. (10, 11) Female genitalia immersed in clove oil, dorsal view: (10) paratype, MHNS; (11) MACN-Ar 11000; (10) general (arrow to sclerotized groove); (11) detail of left spermatheca, digested with KOH. Figure 11 by Cristian Grismado. Scale bars: 0.5 mm (7, 8, 10); 0.1 mm (9, 11).

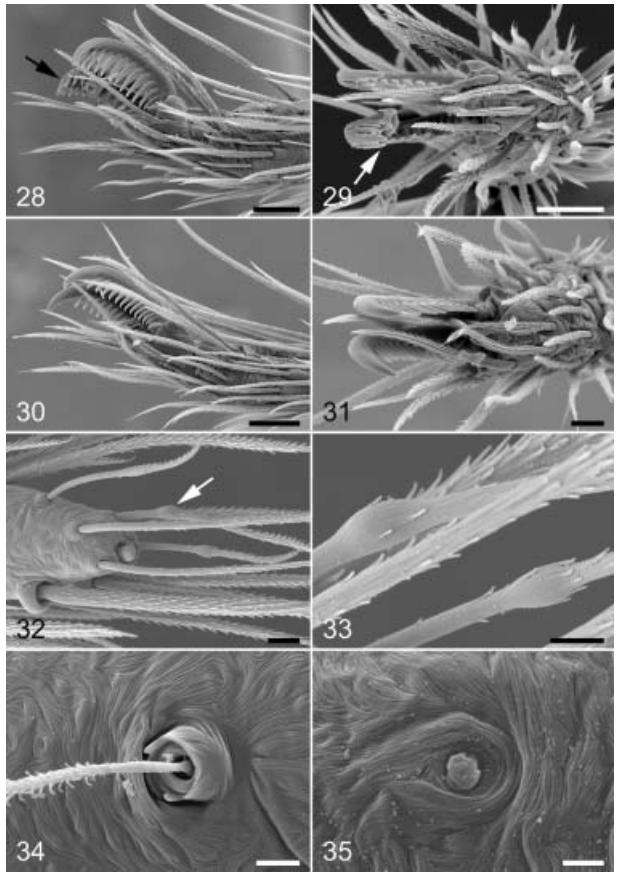


Figures 12–19. *Drymusa rengan* n. sp. habitus of preserved specimens. (12, 13) Female (paratype, MHNS): (12) dorsal; (13) ventral. (14, 15) Male (holotype, MHNS): (14) dorsal; (15) ventral. (16, 17) Female (paratype, AMNH): (16) dorsal; (17) ventral. (18, 19) Male (paratype, AMNH): (18) dorsal; (19) ventral. Scale bars: 1 mm (12–15); 2 mm (16–19).

posterior darker spots, anteriorly prolonged in three longitudinal lines at each side. Abdomen yellow with pale brown chevrons, second and third chevrons thicker than the others, interrupted over cardiac area (Figures 14, 15). Total length, 5.74. Cephalothorax, 2.60 long, 2.12 wide, low and flattened, without fovea. Chelicerae with two teeth, three differentiated setae, carina and gland area in the promargin and two teeth in the retromargin (Figures 24–27); fang short, stout and curved. Endites elongated, converging in front of the labium, with membranous apical edge. Labium 0.68 long, 0.42 wide, separated from sternum by a suture. Sternum 1.44 long, 1.12 wide, rounded posteriorly. Leg measurements: femur: I: 5.66, II: 5.17, III: 4.00, IV: 4.85; patella: I: 0.82, II: 0.82, III: 0.78, IV: 0.82; tibia: I 5.82, II: 4.85, III: 3.56, IV: 4.52; metatarsus: I: 5.49, II: 4.77, III: 3.76, IV: 4.68; tarsus: I: 1.16, II: 1.12, III: 1.00, IV: 1.16; total: I: 18.95, II: 16.73, III: 13.10, IV: 16.03. Tarsi long and thin, with well-developed onychium and thicker setae below claws. Superior claws of legs I and II with two rows of teeth on proclaws and a single row on retroclaws (Figures 28, 29), in both cases reaching the tip of the claw. Superior claws of legs III and IV with a single row of teeth, not reaching the tip of the claw (Figures 30, 31). Inferior claws with a single tooth (Figures 30). Tarsal organ exposed (Figure 35). Proximal plate of trichobothrial socket extending anteriorly on each side (Figure 34). Bulb (Figures 3–9) inserted apically on the cymbium, with long, thin and flexible embolus implanted retrolaterally; tibia globose. Abdomen elongated, posteriorly acute, without the cuticular wrinkles such as those observed in *D. dinora* Valerio, 1971. Tracheal spiracle wide, separated from spinnerets, without elaborations (Figure 20). Epiandrous spigots arising in two bunches from isolated pits (Figure 21). Spinnerets similar in males and females, anterior lateral spinnerets (ALS) with a major ampullate gland spigot and a posterior relictual spigot that may represent a second major ampullate



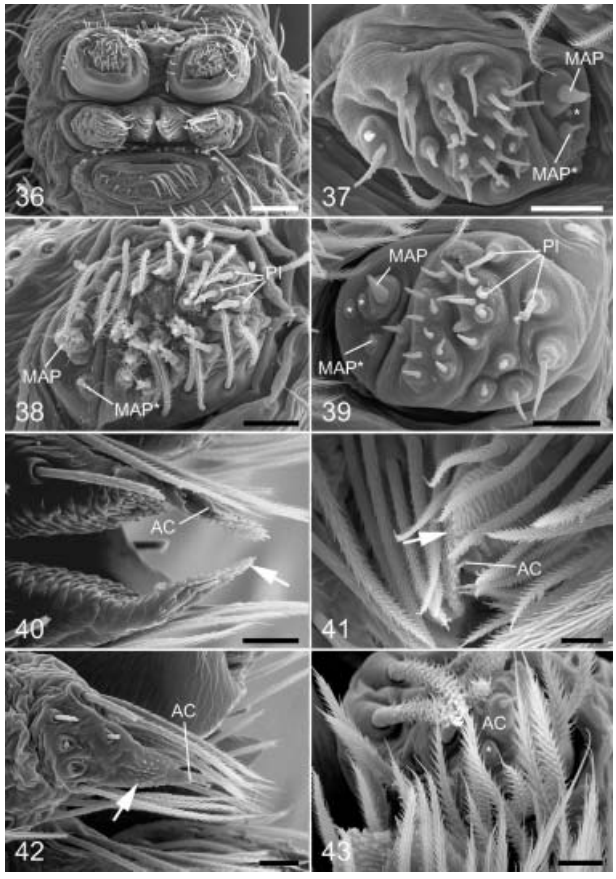
Figures 20–27. *Drymusa rengan* n. sp. (20, 21) Male (MACN-Ar 11007): (20) tracheal spiracle and colulus (CL); (21) epiandrum, ventral. (22–26) Female (MACN-Ar 11000): (22, 23) detail of the left spermatheca: (22) dorsal (arrow to spermatheca); (23) dorsal-anterior (white arrow to same, black arrow to sclerotized groove); (24–27) left chelicerae: (24, 26) apical and posterior view, repectively (arrow to retromarginal tooth); (25) promargin detail (I, promarginal tooth; II, retromarginal and promarginal teeth; III, differentiated setae). (27) Cheliceral gland (arrow). Scale bars: 0.2 mm (26); 0.1 mm (20, 22–24); 0.05 mm (21, 25); 0.02 mm (27).



Figures 28–35. *Drymusa rengan* n. sp., female (MACN-Ar 11000). (28, 29) Left leg I claws (arrow to proclaw): (28) retrolateral; (29) apical. (30, 31) Left leg IV claws: (30) retrolateral; (31) ventral-apical. (32, 33) Left palp: (32) prolateral (arrow to swollen setae); (33) detail of swollen setae. (34) Left leg IV, tibial trichobotia. (35) Left leg I, tarsal organ. Scale bars: 0.05 mm (28–30), 0.02 mm (31, 32); 0.01 mm (33, 34); 0.005 mm (35).

(Figures 37, 39). Piriforms field somewhat divided in islands, spigots more isolated in external margin (Figures 37, 39). One or two small protuberances (“*”, Figures 37 and 39, respectively) adjacent to the large major ampullate similar to nubbins. Posterior median spinnerets (PMS) tetrahedral, with a single aciniform gland spigot, and a projecting median lamina bearing a field of spicules (Figure 41). Posterior lateral spinnerets conical, with one spigot similar to that on PMS, on top of a field of spicules (Figure 43). One small protuberance besides the aciniform spigot, similar to a nubbin (“*”, Figure 43). Colulus well defined (Figure 20).

Female (paratype, MNHS). Carapace orange, slightly darker on the margins, as in male, abdomen darker, more pilose (Figures 12, 13). Total length, 5.33. Cephalothorax, 2.40 long, 2.00 wide, low, flattened, without fovea. Chelicerae and fang as in male. Endites as in male. Labium 0.66 long, 0.40 wide, as in male. Sternum 1.26 long, 1.10 wide, rounded posteriorly. Leg measurements: femur: I: 4.77, II: 4.32, III: 3.48, IV: 4.20; patella: I: 0.72, II: 0.66, III: 0.68, IV: 0.68; tibia: I: 4.77, II: 4.12, III: 3.04, IV: 3.96; metatarsus: I: 4.44, II: 3.72, III: 3.16, IV: 3.84; tarsus: I: 1.16, II: 0.98, III: 1.04, IV: 1.00; total: I: 15.86, II: 13.80, III: 11.40, IV: 13.68. Legs as in male. Palps with a central apical lobe (perhaps a relic of claw) and a pair of setae swollen in the middle above it (Figures 32, 33). Abdomen as in male. Female genitalia atypical for the Scytodoidea, having two small sclerotized grooves above the epigastric furrow that seemingly provide a guide for the embolus. Epigastrium without sclerotized plates. Sclerotized, swollen plate with thick setae posterior to the epigastric furrow (Figures 1, 2). Vulva with two pairs of long, thin spermathecae arising from



Figures 36–43. *Drymusa rengan* n. sp. (36, 38, 40, 42) Female spinnerets (MACN-Ar 11000): (36) spinning field; (38) left anterior lateral spinnerets (ALS); (40) posterior median spinnerets (PMS), posterior view; (42) left posterior lateral spinnerets (PLS). (37, 39, 41, 43) Male (MACN-Ar 11007): (37) right ALS; (39) left ALS; (41) PMS; (43) left PLS. AC, aciniform gland spigot; MAP, major ampullate gland spigot; MAP*, relictual major ampullate; PI, piriform gland spigot; *asymmetrical protuberances. Arrows to a field of spicules. Scale bars: 0.1 mm (36); 0.02 mm (37–40, 42); 0.01 mm (41, 43).

the sclerotized grooves (Figures 10, 11, 22, 23). Spermathecae with gland ductules well spaced or in patches of two to three glands (Figures 11, 22, 23). Spinnerets (Figures 36, 38, 40, 42) as in male, but without protuberances similar to nubbins.

Variation

Six males. Total length 4.40–5.90. Cephalothorax, 2.10–2.72 long, 1.64–2.24 wide. Femur I: 4.80–6.71. Color: some specimens more sclerotized, reddish carapace with darker margins and less evident pattern on cephalic area, and abdominal pattern less contrasted (Figures 18, 19).

Seven females. Total length 5.33–6.79. Cephalothorax, 2.40–3.44 long, 2.00–2.20 wide. Femur I: 4.77–5.82. Color: similar variation as in males (Figures 16, 17).

Natural history

The specimens were collected between rocks and roots well covered by earth and leaf litter, on a hill slope. This microhabitat presented higher humidity levels than the exterior. The specimens walked hanging from their webs or from the bottom side of rocks.

Other scytodoid species examined

Drymusa serrana: 1♂ (MACN-Ar 11021) and 1♀ (MACN-Ar 11017) from Argentina, Buenos Aires Province, Sierra de la Ventana, Parque Provincial Ernesto Tornquist, Cueva del Toro, 38°1.142′ S, 62°0.97′ W, 10 January 2005, G. Binford, J. Miller, F. Labarque and C. Ellison coll.

Drymusa capensis: 1♀ from South Africa, Western Cape, Table Mountain NP, Newland's Forest, 33°58.440′ S, 18°26.648′ W, 145 m, 25 February 2006, J. Miller, H. Wood and N. Larsen coll., deposited in California Academy of Sciences.

Periegops suteri: 1♂ (ARAMR000615) and 1♀ (ARAMR000616) from New Zealand, Banks Peninsula, Hinewai Reserve, near "Big Beech", 43°48.59′ S, 173°01.28′ W, 2 October 2001, C. J. Vink coll., deposited in AMNH. Preparations FML-139, 140, 320–329.

Scytodes globula: 1♀ (MACN-Ar 10789; ARAMR000520) from Argentina, Buenos Aires, Villa Madero, in a house, 13 October 2006, C. Scioscia coll. 1♂ (ARAMR000558) from Argentina, Buenos Aires, Isla Martín Gracia, 4 January 2006, A. Ojanguren and J. Barneche coll. Preparations FML 105–117, 132–134, 245, 246.

Stedocys sp.: 1♀ (ARAMR000637) from Thailand, Chaing Mai, Doi Chiang Dao WS, Amphen Chiangdao, Mae Ta Man forest, field station, 19°19′13.2″ N, 98°49′47.0″ W, ca. 1500 m, 1 October 2003, Martín Ramírez coll. 1♂ (ARAMR000199) from Thailand, Chiang Mai Prov., Doi Inthanon NP, nr intersect. road to Mae Chaem and check-point, wet primary forest, 18°31′33.2″ N, 98°29′57.7″ W, ca. 1800 m, 3 October 2003, ATOL Exped. 2003. Preparations FML 191–195, 217–220, 224–226, 240–242, 244.

Discussion

Lehtinen (1986) argued that Scytodidae, Drymusidae and Periegopidae share a similar dentition in the tarsal claws, although he did not describe this dentition. Forster (1995) placed Periegopidae close to Scytodidae by the presence of a doble row of teeth on the ventral surface of the retroclaw and a single row on the proclaw of legs I and II. However, when we examined material of *Periegops suterii*

Urquhart, 1892 and *Scytodes globula* Nicolet, 1849 we found that Forster mistakenly reported the double row of teeth on the retroclaw, because they were on the proclaw. At least *Drymusa rengan* n. sp., *D. serrana* and *Drymusa capensis* Simon, 1893 from South Africa (personal observation) share this condition with these two families. Nevertheless, it seems that *D. spelunca* does not share this condition (Bonaldo et al., 2006, p. 458), although their Figure 18 is not conclusive. The presence of a field of spicules on the median surface of the posterior median spinnerets in *Periegops* Simon, 1893 (Forster, 1995, Figure 35), *Drymusa* and Scytodidae gives further support to their relationship. Forster's suggestion (1995) of the relation of Drymusidae, Scytodidae and Periegopidae by the reduction of spigots in posterior median and lateral spinnerets to only a single aciniform seems to be sustained by this newly illustrated species, even though Platnick et al. (1991, Figure 8588) found that the posterior lateral spinnerets of a larger *Drymusa* species from South Africa have more than one spigot, especially in females.

Acknowledgments

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