



ARTICLE

The genus *Naatlo* (Araneae: Theridiosomatidae): distribution and taxonomic history

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ABSTRACT: (The genus *Naatlo* (Araneae: Theridiosomatidae): distribution and taxonomic history). This article is a summary of the taxonomic history and distribution of species of *Naatlo* (Araneae: Theridiosomatidae). It is an important contribution because it reviews information that is scattered throughout several papers. Distribution maps, color photographs of the habitus and genitalia, and many new records are provided.

Key words: neotropical, spider, Arachnida, taxonomy.

RESUMO: (Gênero *Naatlo* (Araneae: Theridiosomatidae): distribuição e histórico taxonômico). O presente artigo aborda a distribuição geográfica das espécies de *Naatlo*, representando-as graficamente em mapas, além de um sumário do histórico taxonômico do gênero. É uma contribuição importante, pois reúne e discute informações sobre a distribuição das espécies, que se encontravam espalhadas em vários trabalhos. Além disso, fotografias coloridas do habitus e da genitália e muitos novos registros são fornecidos.

Palavras-chave: neotropical, aranha, Arachnida.

INTRODUCTION

Theridiosomatidae currently includes 77 species distributed in 12 genera, among which nine genera and 49 species are found in the Neotropics (Platnick 2010). The family is split into four subfamilies: Platoninae, Epeirotypinae, Ogulniinae and Theridiosomatinae. The Epeirotypinae are represented by *Naatlo* Coddington, 1986 and *Epeirotypus* Pickard-Cambridge, 1894. They form a group diagnosed by the presence of four characteristics: (1) the median apophysis is a round and notched disk; (2) the paracymbium is a flat, blade-like apophysis, broadly attached to the cymbia; (3) the epigynum is a convex bulging dome, which has a posterior margin that is closely appressed to the abdominal ventral wall; and (4) the tegula are very expanded on their lateral faces (Coddington 1986).

Naatlo is distinguished from all other genera by the presence of an epigynal flap that is hinged anteriorly and covers the copulatory bursa in the females and the reduced conductor and more complex embolic tip of the palp of the males (Coddington 1986). The great similarity of the palp and epigynum among the species makes the species difficult to identify, as reported by Coddington (1986). Abdominal color pattern was also noted by Coddington (1986) to be very useful for differentiating species.

These minute spiders (approximately 3 mm long) construct their webs near the soil surface in low vegetation and leaf litter of shady and damp forests (Coddington 1986). These modified orb webs can be found in a horizontal or a vertical plane, with a tension line distorting the web into a conical shape, which helps capture small flying insects.

This mechanism was discussed in detail and illustrated by Hingston (1932).

The first species of *Naatlo* was described by Taczanowski (1879) as *Theridium splendidum*, based on a single female from Brazil. This was also the first known theridiosomatid. Simon (1897) described a second *Naatlo* species, *T. fauna*, from a sample containing one male and nineteen females from Venezuela. In 1932, Hingston described a third species, *Theridiosoma sylvicola*, in his report about an expedition to British Guyana. He carefully described and illustrated the prey capture mechanism of this species, but did not mention important morphological characteristics.

Coddington (1986) published the most complete contribution about the taxonomy of the genus. In this work, Coddington established the genus *Naatlo* and transferred the three species cited above to this genus. A female lectotype was designated for *N. fauna*. The female of this species was redescribed and the first description of a male was provided. The female of *N. splendida* was also redescribed, and the first description of the male of this species was included. The type species of the genus, *N. sutila*, was newly described, based on males and females collected from Colombia, Panama and Surinam. The last two species of *Naatlo*, *N. maturaca* and *N. serrana*, were described by Rodrigues and Lise (2008), and are both from Brazil. In addition, histological studies made by Lopez and Juberthie-Jupeau (1988) on *N. splendida* cannot be forgotten, where details of the structure of its labiosternal glandules were given.

Currently *Naatlo* comprises six species, which are all endemic to the Neotropics: *N. fauna*, *N. maturaca*, *N. sutila*, *N. splendida*, *N. serrana* and *N. sylvicola*. However,

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the genus should be carefully revised because it contains many undescribed species, which have been seen by the author in several collections. In addition, species such as *N. maturaca*, *N. serrana* and *N. sylvicola* should be transferred to a new genus.

This article is a synthesis of the information known about the six species of *Naatlo*, and follows the structure of the taxonomic catalogs published by Platnick (2010) and Kury (2003). It provides photographs of the habitus and genitalia, maps, details about type material and records cited in other taxonomic works, and increases what is known about the geographic distribution of these species.

MATERIAL AND METHODS

The species distribution maps were based on the records from a database compiled in Microsoft Office Excel (2003), which included all data cited in previous taxonomic articles about species of *Naatlo* and all data found on the examined specimen vials. Each locality recorded was georeferenced. ArcMap 9 was used to analyze the distribution data and to create the distribution maps. Through visits and loans, it was possible to examine specimens deposited in the collections at the following institutions: AMNH - American Museum of Natural History, New York, USA; FZB - Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, Brazil; GWU - George Washington University, Washington, USA; INCIVA - Instituto para la Investigación y la Preservación del Patrimonio Cultural y Natural del Valle del Cauca, Colombia; INPA - Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil;

MCTP - Museu de Ciências e Tecnologia da PUCRS, Porto Alegre, Brazil; MCZ - Museum of Comparative Zoology, Cambridge, USA; MNRJ - Museu Nacional do Rio de Janeiro, Rio de Janeiro, Brazil; UBTU - Universidade Estadual Paulista, Botucatu, Brazil; UNAL - Universidad Nacional, Bogotá, Colombia; USNM - National Museum of Natural History, Smithsonian Institution, Washington, USA.

Other institutions cited in this paper are the following: BMNH - The British Museum of Natural History, London, England; CAS - California Academy of Sciences, San Francisco, USA; MACN - Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina; MNHN - Muséum National d'Histoire Naturelle, Paris, France; MPEG - Museu Paraense "Emílio Goeldi", Belém, Brazil; PAN - Polish Academy of Sciences, Warsaw, Poland.

The papers cited in the taxonomic catalog follow the order adopted on *The World Spider Catalog*, version 10 (Platnick 2010), which is widely considered a standard for spider taxonomy. The letters in lowercase, after each citation year, were included so comparisons could be made with this catalog. Only citations containing relevant taxonomic contributions, such as new records, descriptions, and additional specimens are included.

RESULTS

THERIDIOSOMATIDAE Simon, 1881

Gen. *Naatlo* Coddington, 1986

Naatlo Coddington, 1986: 44.

Type: *Naatlo sutila* Coddington, 1986.

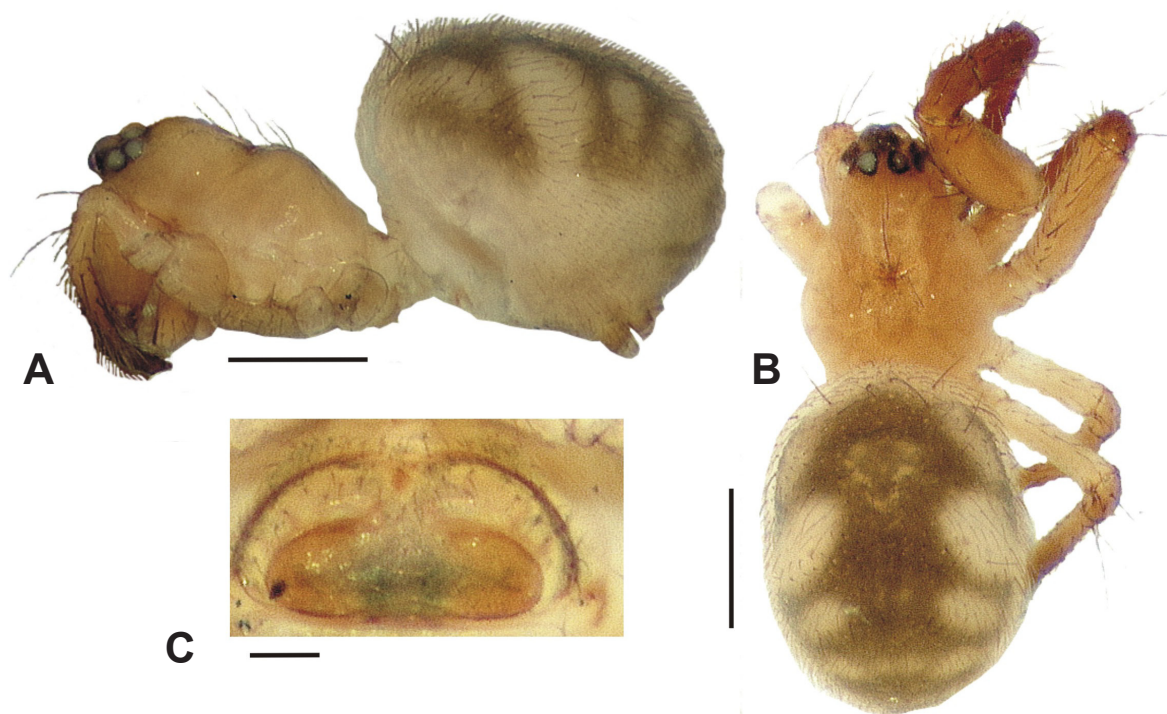


Figure 1. *Naatlo* fauna. (A) lateral view, (B) dorsal view, (C) epigynum, ventral view, not clarified. Scale lines: habitus = 0.5 mm, epigynum = 0.1 mm.

Naatlo fauna (Simon, 1897)

Figures 1A–C, 8

Theridiosoma fauna Simon, 1895a: 914, fig. 987 (m, *nomen nudum*).*Theridiosoma fauna* Simon, 1897b: 483 (Dmf).*Naatlo f.*: Coddington, 1986: 50, figs. 69, 91–98 (Tmf from *Theridiosoma*).**Type locality:** VENEZUELA. Carabobo: San Esteban (f lectotype plus 1 m and 18 f paralectotypes MNHN, designated by Coddington, 1986).**Distribution:** COSTARICA, PANAMA, COLOMBIA, VENEZUELA, TRINIDAD AND TOBAGO, ECUADOR, PERU (new record), BRAZIL.**Records:** COSTA RICA. San José: Quizarra, 6 mi SW San Isidro del General (MCZ, Coddington 1986, examined); PANAMA. canal zone: Lake Gatun, Barro Colorado Island (MCZ, Coddington, 1986, examined); COLOMBIA. Amazonas: rivers Apaporis and Pira (CAS, new record); Nariño: La Planada, 7 km S of Chochones (USNM, new record); río San Juan, tributary of río Dagua, near Queremal (MCZ, Coddington 1986, examined); Valle del Cauca: above Atuncela (MCZ, Coddington 1986, examined); 28km E of Buena Ventura (USNM, new record); Buena Ventura, Escarlata (INCIVA, new record); near Saladito (MCZ, Coddington 1986); El Topacio, Farallones del Cali National Park (INCIVA, new record); Palmira, la Sirena (INCIVA, new record). VENEZUELA. Aragua: Choroní (AMNH, Coddington 1986, examined); carabobo: San Esteban (MNHN, Coddington, 1986, Simon, 1897b); TRINIDAD AND TOBAGO. St. George: Arima Road, gap in Blanchisseuse

(AMNH, Coddington 1986, examined); ECUADOR. Pichincha: río Palanque, 47 km SW Santo Domingo, on road to Queredo (MCZ, Coddington 1986, examined). PERU. Huanuco: Santa Teresa, Huallanca (CAS, new record). BRAZIL. Amazonas: Manaus, junction of Madeira and Purus rivers, Geoma2- area1 (INPA, new record), Tefê, Estação Ecológica de Mamirauá (FZB, new record). Rio de Janeiro: Teresópolis (USNM, Coddington 1986, examined).

Naatlo maturaca Rodrigues & Lise 2008

Figures 2A–C, 7

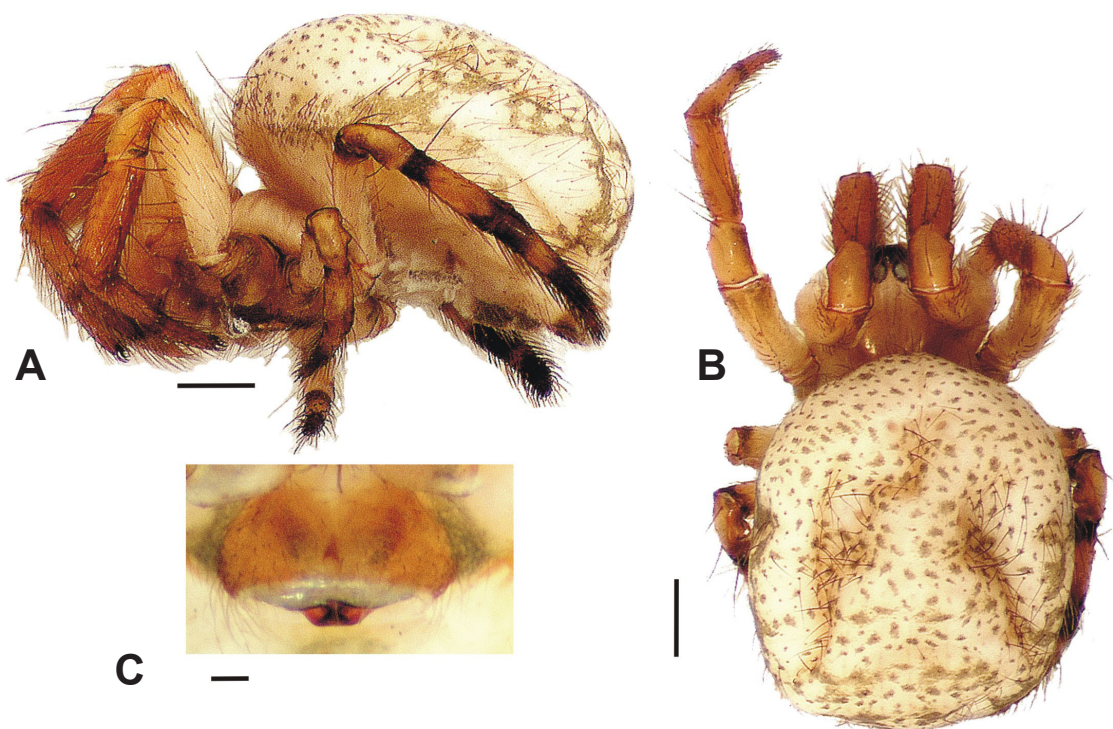
Naatlo maturaca Rodrigues & Lise, 2008: 303, figs. 28–54 (Dmf).**Type locality:** BRAZIL. Amazonas: São Gabriel da Cachoeira, Maturacá, 14.x.1990, A. A. Lise (Holotype m, MCTP 1443); Paratypes: 6 f, same locality and collector as holotype, 12.x.1990 (MCTP 1226, 19541); 1 m and 1 f, Benjamin Constant, xii.1079 (MCZ 8914); 1 m and 1 f, Manaus (Reserva Adolpho Ducke), 18.xii.1987, all collected by A.A. Lise (MCZ 8914, 32593); Pará: 1 m and 1 f, Melgaço, Caxiuanã, Estação Científica Ferreira Penna, 11.vii.1996, A. A. Lise (MCTP 2390).**Distribution:** BRAZIL.**Records:** BRAZIL. Amazonas: 80 km Manaus, reserva Gavião (MCZ, new record); Benjamin Constant (FZB, Rodrigues & Lise, 2008); Manaus, junction of Madeira and Purus rivers, Geoma2- area2 (INPA, new record); Manaus, reserva Adolpho Ducke (FZB Rodrigues & Lise, 2008); Manaus, reserva Cabo Frio (MCZ, new record); São Gabriel da Cachoeira, Maturacá (MCTP, Rodrigues

Figure 2. *Naatlo maturaca*. (A) lateral view, (B) dorsal view, (C) epigynum, ventral view, not clarified. Scale lines: habitus = 0.5 mm, epigynum = 0.1 mm.

& Lise, 2008). par : Melga o, Caxiuana, Est  o Cient fica Ferreira Penna (MCTP, Rodrigues & Lise, 2008). mato grosso: Chapada dos Guimar es (MCTP, Rodrigues & Lise, 2008), Santo Ant nio de Leverger (MCTP, Rodrigues & Lise, 2008).

Naatlo serrana Rodrigues & Lise 2008

Figures 3A–C, 8

Naatlo serrana Rodrigues & Lise, 2008: 299, figs. 1–97 (Dmf).

Type locality: BRAZIL. Rio Grande do Sul: S o Francisco de Paula, Centro de Pesquisas e Conserva  o da Natureza Pr -Mata, 05–09.iii.1997, A. A. Lise (Holotype m, MCTP 14079). Paratypes: 5m, 5f, same locality and collector as holotype, 21–24.iii.1995, i.1996, 9–12.i.1997, 20.iii.1998 (MCTP 37598, 37599, 37600, 37618); 5m and 5f, same locality and collector as holotype, 23.i.1981 (MCTP 9535).

Distribution: BRAZIL.

Records: BRAZIL. Rio Grande do Sul: S o Francisco de Paula, Centro de Pesquisas e Conserva  o da Natureza Pr -Mata (MCTP and FZB, Rodrigues & Lise 2008).

Naatlo splendida (Taczanowski, 1874)

Figures 4A–C, 7

Theridium (Phrurolithrum) splendidum Taczanowski, 1874 (1873): 60. *Theridiosoma* s.: Keyserling, 1884a: 221, pl. 10, f. 134 (f); Archer, 1953: 12, f. 20 (f).

Naatlo s.: Coddington, 1986: 47, f. 73, 84–90 (Tf from *Theridiosoma*, Dm).

Type locality: BRAZIL. Amap : Uassa (Ua   river, near the border with French Guyana) (holotype f,

PAN).

Distribution: PANAMA (new record), COLOMBIA, VENEZUELA (new record), GUYANE FRAN AISE, ECUADOR (new record), PERU, BOL VIA, BRAZIL.

Records: PANAMA. El Llano: Cart  road (MCZ, new record); COLOMBIA. Meta: 15 km SW Puerto Lopez, Hacienda Mozambique, (MCZ, Coddington 1986, examined); VENEZUELA. Amazonas: Cerro de la Neblina, 140 m (USNM, new record); GUYANE FRAN AISE. cayenne: Cayenne (AMNH, Coddington 1986, examined); Ecuador. napo: Archidona cave oriente, 7mi N (CAS, new record); Puerto Napo 20 km E, Alinahui (CAS, new record); River Topo (CAS, new record); PERU. Amazonas: Monterrico (Petrunkevitch, 1911); Hu nuco: Tingo Maria (AMNH, Coddington 1986, examined); Monson Valley (CAS, new record); Loreto: Mamor  river, near Iquitos (CAS, new record); Requena, Jenaro Errera (CAS, new record); Ucayali: Divisoria, between Tingo Maria and Pucallpa (AMNH, Coddington 1986, examined); Madre de Dios: Reserva Tambopata (USNM, new record); Pasco: Iscozac n, P.E. Pichizpalzozu, (USNM, new record); BOL VIA. Beni: Rio Benicito, Chacobo Indian village (AMNH, Coddington 1986, examined); la paz: Sapecho (FZB, new record). BRAZIL. Amazonas: junction of Madeira and Purus rivers, Geoma2 - area1 (INPA, new record); par : Novo Progresso, Serra do Cachimbo, Campo de Provas Brigadeiro (MPEG, new record); Oriximin , acima do Rio Mapuera (Archer, 1953. AMNH?, not found in AMNH, USNM or MCZ); Rodrigues & Ott, 2005); Santar m, Alter do Ch o (FZB, new record); Rio

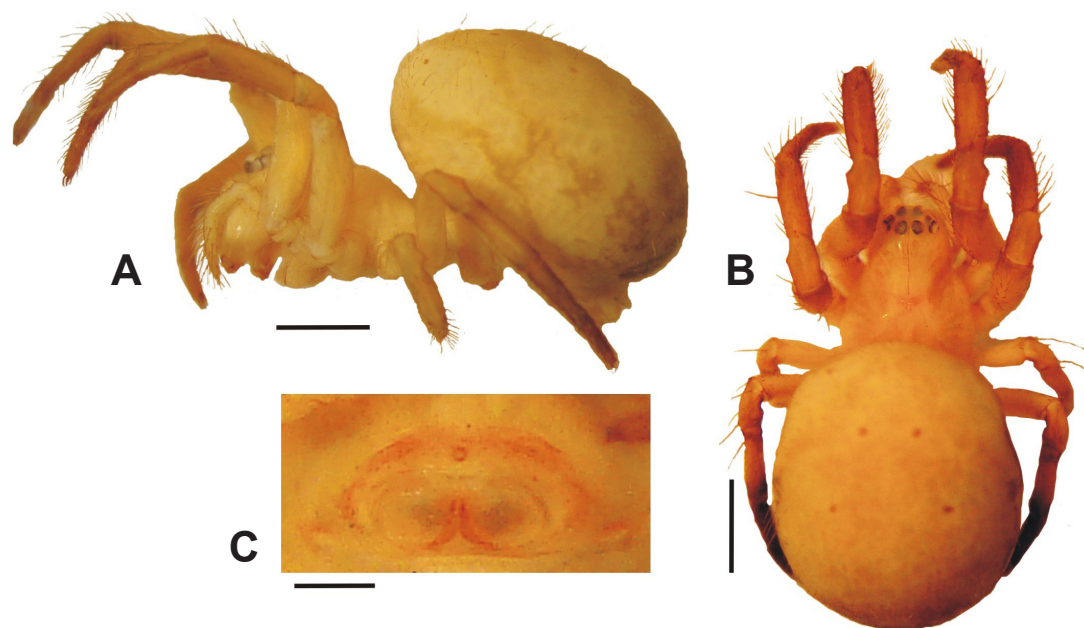


Figure 3. *Naatlo serrana*. (A) lateral view, (B) dorsal view, (C) *epigynum*, ventral view, not clarified. Scale lines: habitus = 0.5 mm, epigynum = 0.1 mm.

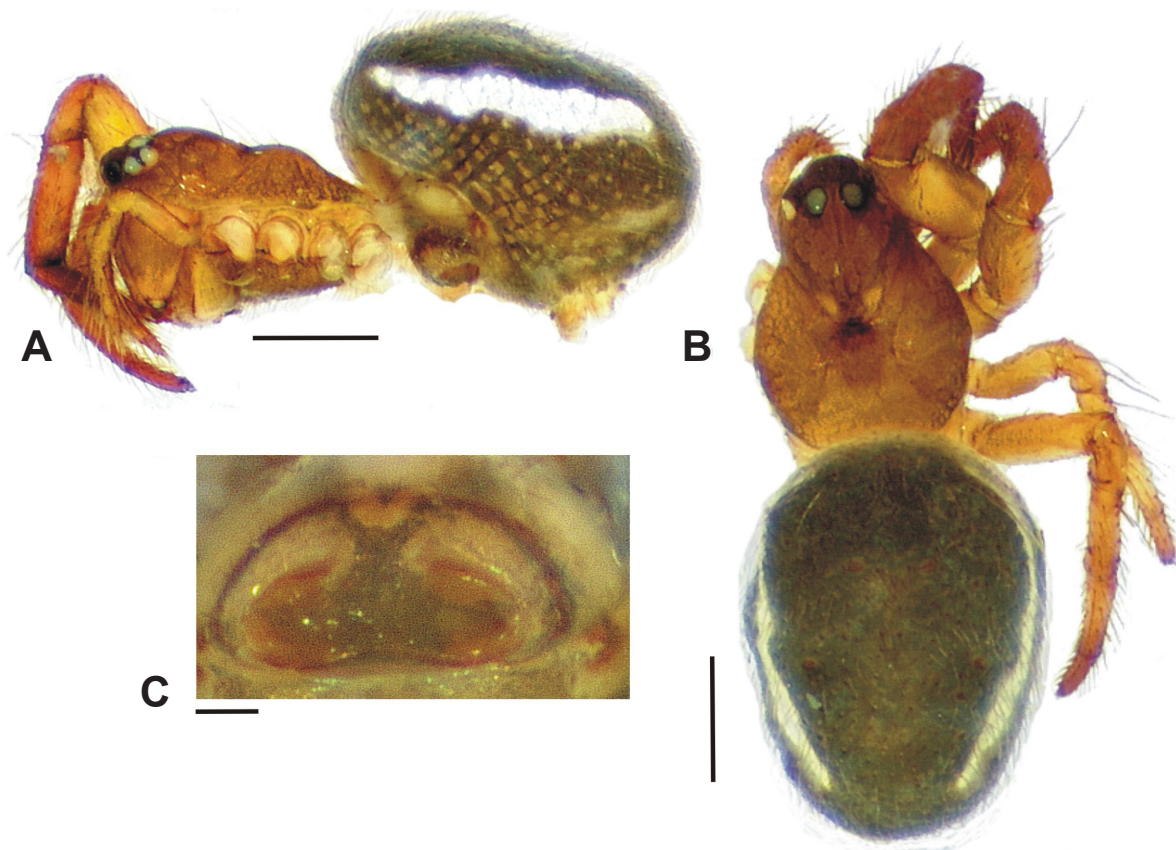


Figure 4. *Naatlo splendida*. (A) lateral view, (B) dorsal view, (C) *epigynum*, ventral view, not clarified. Scale lines: habitus = 0.5 mm, epigynum = 0.1 mm.

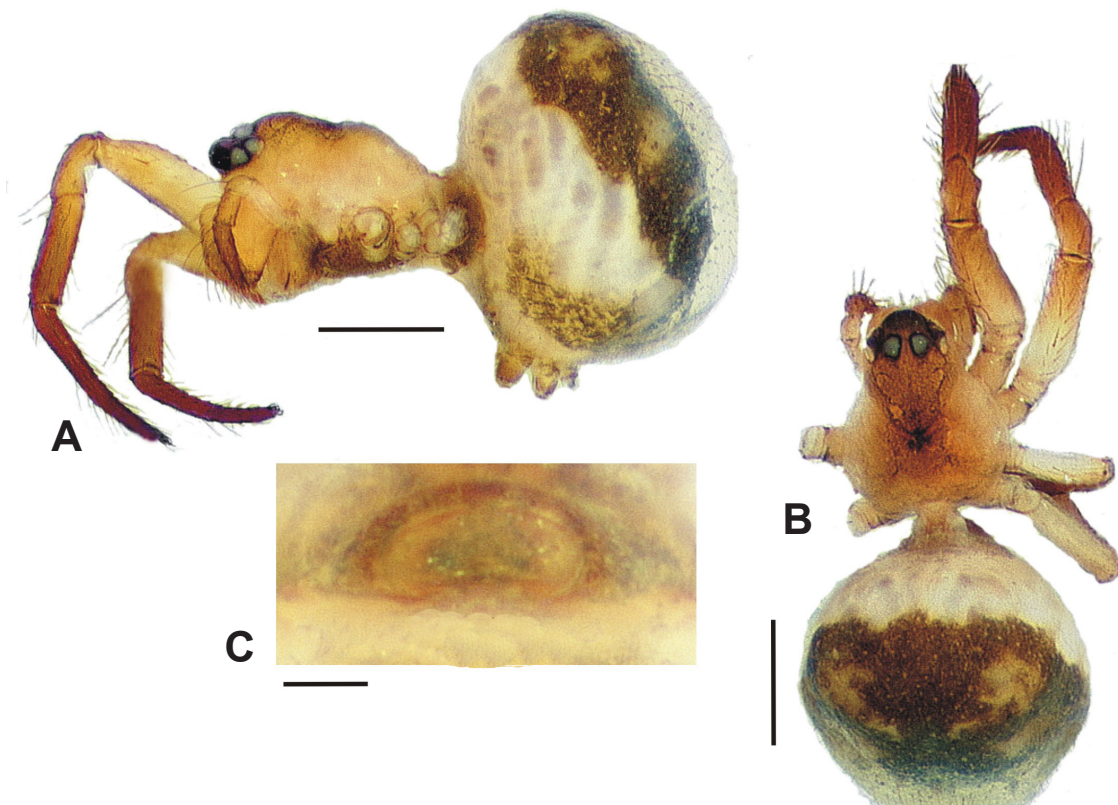


Figure 5. *Naatlo sutila*. (A) lateral view, (B) dorsal view, (C) *epigynum*, ventral view, not clarified. Scale lines: habitus = 0.5 mm, epigynum = 0.1mm.

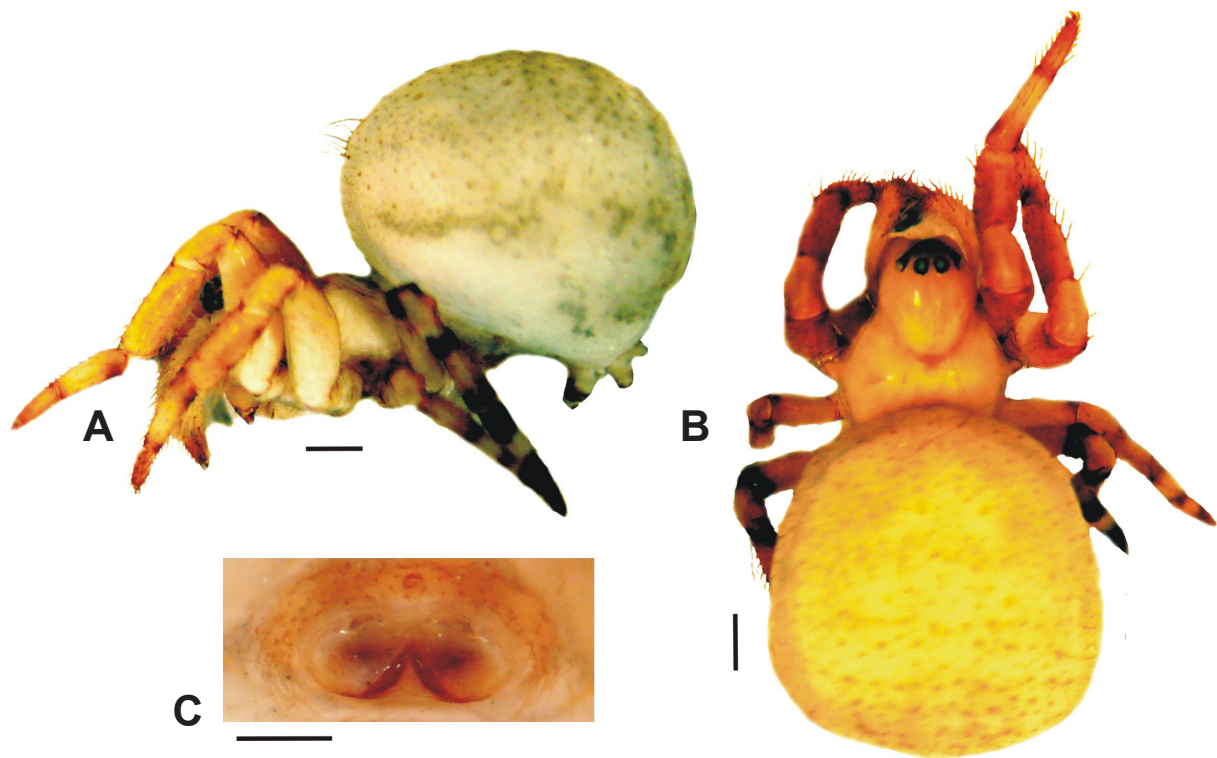


Figure 6. *Naatlo sylvicola*. (A) lateral view, (B) dorsal view, (C) epigynum, ventral view, not clarified. Scale lines: habitus = 0.5 mm, epigynum = 0.1 mm.

Grande do Sul: Derrubadas, Parque Estadual do Turvo (FZB, Rodrigues & Ott, 2005); Santa Isabel, 15 Km Sul (FZB, Rodrigues & Ott, 2005).

Naatlo sutila Coddington, 1986

Figures 5A–C, 9

Naatlo sutila Coddington, 1986: 45, f. 70–72, 74–83 (Dmf).

Type locality: COLOMBIA. Valle: near Saladito, 1.700 m (MCZ 23203). Paratype m: same as holotype (Holotype f, MCZ 24440).

Distribution: PANAMA, COLOMBIA, VENEZUELA (new record), TRINIDAD AND TOBAGO (new record), SURINAME, PERU (new record), BRAZIL (new record), ARGENTINA (new record).

Records: PANAMA. Canal Zone (MCZ, Coddington 1986, examined); COLOMBIA. Boyaca: Santa Maria, Vereda Cavo Negro Cuchilla Negra (UNAL, new record); Guainía: Inírida, river Inírida, Resguardo Indígena “La Ceiba” (UNAL, new record); Huila: E Santa, Leticia (MCZ, Coddington 1986, examined); Santander: Piedecuesta, Estación Experimental “El Rasgón” (UNAL, new record); Tona, El Brasil (UNAL, new record); Valle: Central Hidalgo, Anchicayá (MCZ, Coddington 1986, examined); Saladito (MCZ, Coddington 1986, examined); VENEZUELA. Bolívar: 40 km W St. Elena (AMNH, new record); 6km S San Isidro (AMNH, new record); Táchira: Pregonero, Presa Las Cuevas (AMNH, new record); TRINIDAD AND TOBAGO. SE Navy Base (AMNH, new record); SURINAME. Saramacca: Voltzberg Nature Reserve (MCZ, Coddington 1986,

examined); PERU. Cajamarca: San Andres de Cutervo (USNM, new record); Huanuco: Huallega, Cucharas

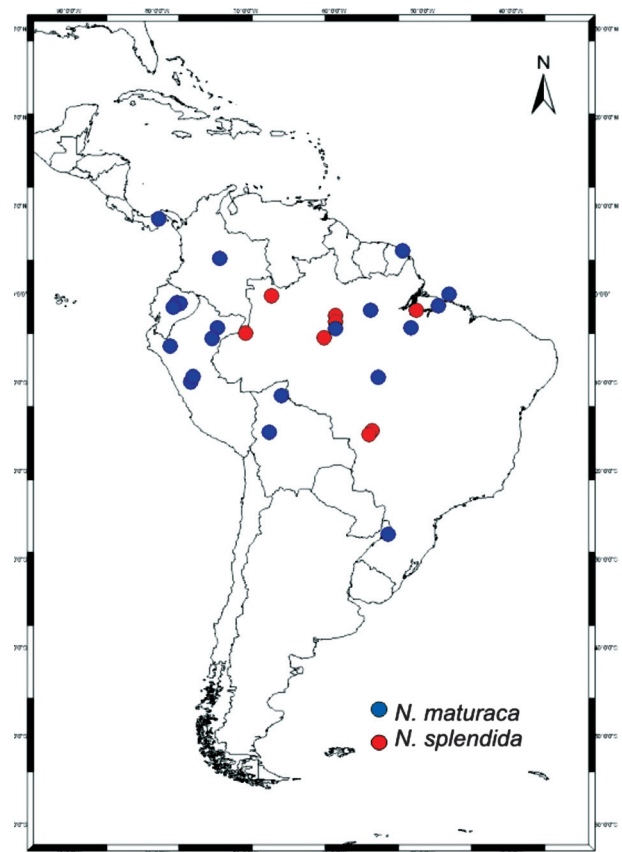
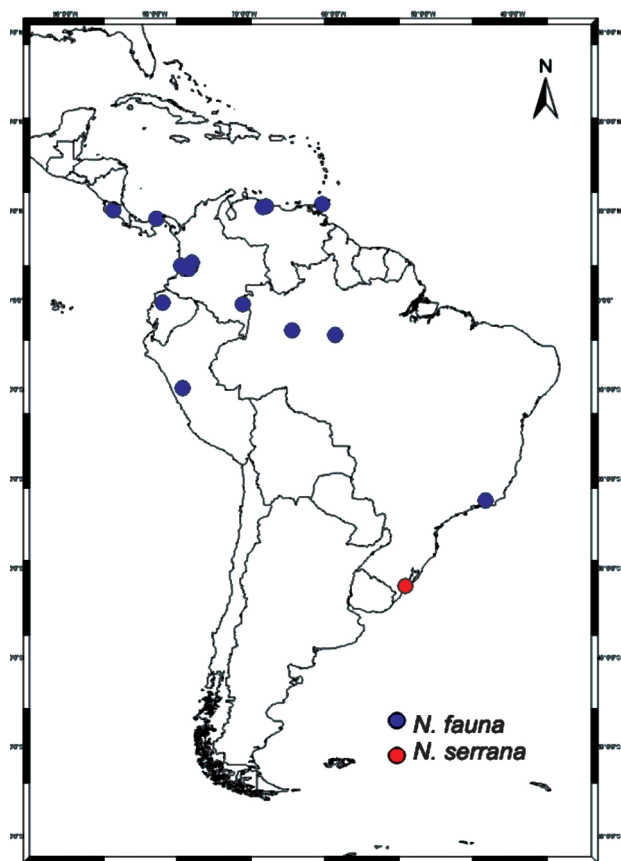
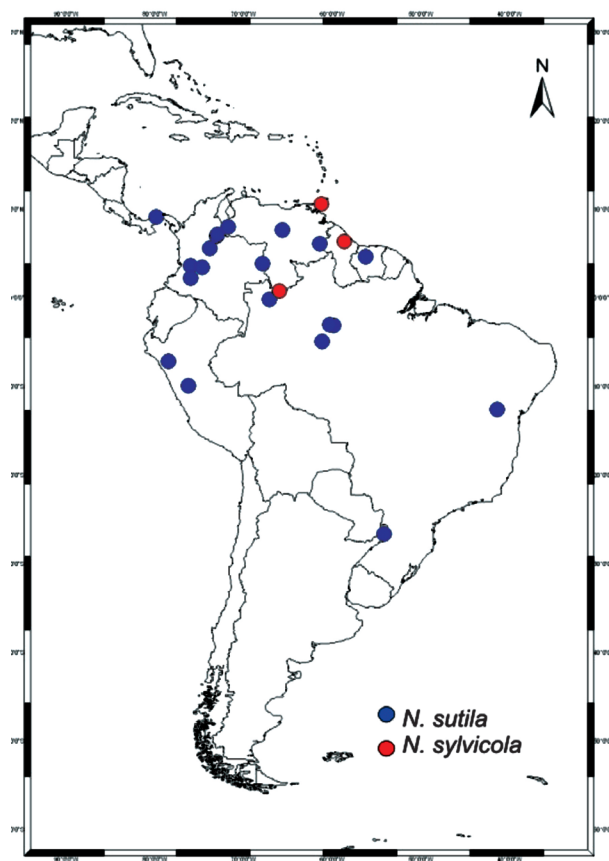


Figure 7. Distribution of *N. matoraca* and *N. splendida*.

Figure 8. Distribution of *N. fauna* and *N. serrana*.Figure 9. Distribution of *N. sutila* and *N. sylvicola*.

(CAS, new record); BRAZIL. Amazonas: Manaus, junction of Madeira and Purus rivers, Geoma2- area2 (INPA, new record); Manaus, reserva Ducke (INPA, new record); Manaus, rio Tarumã-Mirim (INPA, new record); São Gabriel da Cachoeira, Pico da Neblina (INPA, new record); Bahia: Lençóis (MNRJ, new record); ARGENTINA. Misiones: San Pedro, Cruce Caballero (MACN, new record).

***Naatlo sylvicola* (Hingston, 1932)**

Figures 6A–C, 9

Theridiosoma sylvicola. Hingston, 1932: 376 (Df)

T. s.: Archer, 1953: 12, f. 25 (f)

Naatlo s.: Coddington, 1986: 52 (Tf from *Theridiosoma*).

Type locality: GUYANA: Essequibo river (types, BMNH?).

Distribution: VENEZUELA (new record), TRINIDAD AND TOBAGO (new record), GUYANA.

Records: VENEZUELA. Amazonas: Cerro de la Neblina (USNM, new record); TRINIDAD AND TOBAGO. arima: Asa Wright Nature Center (GWU, new record); GUYANA. Potaro/Siparuni: Kaieteur (AMNH, Archer, 1953, examined).

DISCUSSION

Naatlo fauna was known from ten localities in Costa Rica, Panama, Colombia, Venezuela, Trinidad and To-

bago, Ecuador and Brazil; however, nine new localities were discovered during this study (one in Peru, six in Colombia and two in Brazil). *Naatlo maturaca* was known from six localities in Brazil, but is now known to occur in three additional localities in the state of Amazonas. *Naatlo serrana* is only known from the type locality (Rio Grande do Sul, Brazil). *Naatlo splendida* was known from ten localities in Colombia, French Guyana, Brazil, Bolivia and Peru, but is now known from eleven new localities and three new countries (one in Panama, one in Venezuela, three in Ecuador, one in Bolivia and five in Brazil). *Naatlo sutila* was known from six localities in Panama, Colombia and Suriname, but is now known to occur in twelve new localities and five new countries (Venezuela, Trinidad and Tobago, Peru, Brazil and Argentina). *Naatlo sylvicola* was only known from the type locality (Guyana), but is now known from two new localities in Venezuela and Trinidad and Tobago.

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