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ZOOLOGIA 33(6): e20160160
ISSN 1984-4689 (online)
www.scielo.br/zool

TAXONOMY AND NOMENCLATURE

A new genus of Neotropical spiders of the family Sparassidae (Arachnida: Araneae)

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ABSTRACT. *Nungara* **gen. nov.** is proposed to include the type species, *Nungara niveomaculata* (Mello-Leitão, 1941) **comb. nov.**, transferred from *Olios* Walckenaer, 1837 and two new species, described from males and females: *N. anama* **sp. nov.**, from the states of Sergipe, Alagoas and Espírito Santo, and *N. gaturama* **sp. nov.**, from the states of Sergipe, Bahia and Espírito Santo, all in Brazil. The new genus is distinguished from all other Neotropical sparassid genera by the presence of a deep tegular groove on the male palpal bulb and a hood-like projection on the median septum of the female epigyne. In addition, *Olios fuscovariatus* Mello-Leitão, 1943, *Stasina koluene* Mello-Leitão, 1941 and *Polybetes proximus* Mello-Leitão, 1943 are transferred to *Nungara* **gen. nov.** and considered junior synonyms of *N. niveomaculata*. All species are described and illustrated and a distribution map is provided.

KEY WORDS. Brazil, new species, South America, taxonomy.

Species of *Polybetes* Simon, 1897 are amongst the most common sparassids found in Brazilian arachnological collections. Their large size and wandering habits, and the fact that they are usually not aggressive, makes them easily visualized and easily collected, even by inexperienced collectors (Gerschman & Schiapelli 1965).

The genus was originally described to include the type species, *Olios martius* Nicolet, 1849, and *Voconia maculata* Keyserling, 1880, based on the anterior and posterior eye rows slightly procurved, rarely straight, and on the presence of only two promarginal teeth on the chelicerae (Simon 1897). Currently it includes 13 species, all distributed in South America. *Polybetes martius* (Nicolet, 1849) and *P. delfini* Simon, 1904, were described from Chile. *Polybetes pythagoricus* (Holmberg, 1875), *P. rapidus* (Keyserling, 1880), *P. quadrifoveatus* (Järvi, 1914), *P. trifoveatus* (Järvi, 1914), *P. punctulatus* Mello-Leitão, 1944 and *P. pallidus* Mello-Leitão, 1941 were described from Argentina. *Polybetes germaini* Simon, 1897 and *P. parvus* (Mello-Leitão, 1941) were described from Paraguay and *P. obnutus* Simon, 1897 from Bolivia. The Brazilian species, *Polybetes proximus* Mello-Leitão, 1943 and *P. rubrosignatus* Mello-Leitão, 1943, were described from Paraíba and Rio Grande do Sul, respectively. The Argentinian species of the genus were revised by Gerschman & Schiapelli (1965), who redescribed *P. martius*, *P. delfini*, *P. germaini*, *P. obnutus*, *P. rapidus* and *P. pythagoricus* and described for the first time the males of *P. trifoveatus*, *P. punctulatus* and *P. pallidus*.

A careful examination of the original descriptions (Simon 1897, Järvi 1914, Mello-Leitão 1941, 1943b, 1949, Gerschman & Schiapelli 1965) and a comparison between type specimens of the species of *Polybetes* with the type species, *P. martius*, shows that not all species belong to this genus. This is the case of *P. proximus*.

Polybetes martius shows characters commonly associated to the subfamily Sparassinae, such as two pairs of ventral spines on tibiae I-IV and chelicerae with two promarginal teeth and no intermarginal denticles (Jäger 1998). *Polybetes proximus*, on the other hand, shows characters that suggest that, although not a true Heteropodinae, it is more proximately related to genera belonging to this subfamily, such as three pairs of ventral spines on tibiae I-IV, three promarginal teeth and intermarginal denticles (Jäger 1998).

The combination of three promarginal teeth and intermarginal denticles is also found in the Neotropical genera *Anaptomecus* Simon, 1903, *Sparianthina* Banks, 1929, *Guadana* Rheims, 2010 and *Caayguara* Rheims, 2010 (Jäger et al. 2009, Rheims 2010a, b, Guala et al. 2012). Nevertheless, *P. proximus* cannot be assigned to any of these genera. *Anaptomecus*, *Sparianthina* and *Guadana* share the presence of a long-toothed female pedipalp claw (*P. proximus* has a short-toothed claw) and four pairs of ventral spines on tibiae I-II (*P. proximus* has three). *Caayguara* has only two pairs of ventral spines on tibiae I-II, and a single strong setae at the base of fang (*P. proximus* has 4-6). Additionally, *P. proximus* shows genitalic characters that are not present in any other known Neotropical genera, such as a deep tegular groove on the male palpal bulb and a hood-like projection on the female epigyne.

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Based on the above mentioned evidences, in this paper we propose the new genus *Nungara* **gen. nov.** to include *P. proximus* and two new species, described from males and females from northeastern and southeastern Brazil. *Olios niveomaculatus* Mello-Leitão 1941, *O. fuscovariatus* Mello-Leitão, 1943 and *Stasina koluene* Mello-Leitão, 1941 are also transferred to this new genus and the two latter species, together with *P. proximus*, are considered junior synonyms of *N. niveomaculata* **comb. nov.**

MATERIAL AND METHODS

The examined material is deposited in the following Brazilian institutions (curator in parentheses): IBSP, Instituto Butantan, São Paulo (A.D. Brescovit); MNRJ, Museu Nacional, Rio de Janeiro (A.B. Kury); MPEG, Museu Paraense Emilio Goeldi, Belém (A.B. Bonaldo); MZSP, Museu de Zoologia da Universidade de São Paulo, São Paulo (R. Pinto da Rocha); UFMG, Centro de Coleções Taxonômicas, Universidade Federal de Minas Gerais, Belo Horizonte (A.J. Santos); UFPB, Coleção de Aracnídeos e Miriápodes da Universidade Federal da Paraíba, João Pessoa (M.B. DaSilva).

Morphological observations and illustrations were made using a Leica MZ12 stereomicroscope with a camera lucida. Measurements were taken with a micrometric ocular and are given in millimeters. Female genitalia were examined in clove oil after dissection. Photos of dorsal habitus, male palps and female epigyne were taken using a Leica DMC 4500 camera attached to a Leica M205 A stereomicroscope. Extended focal range images were composed with the program Leica Application Suite version 4.8.0. Scanning electron micrograph images (SEM) were made on a FEI Quanta 250 scanning electron microscope from the Laboratório de Biologia Celular at the Instituto Butantan. Material used for SEM was dehydrated through a series of graded ethanol (80% to 100%), dried overnight in an incubator at 35°C, mounted on metal stubs and sputter coated with gold.

Format of descriptions follows Rheims (2007). Only characters that differ from the generic pattern are mentioned in the species descriptions. Spine notation follows Petrunkevitch (1925) with variation in parentheses. Leg measurements are listed as: total length (femur, patella, tibia, metatarsus, tarsus); eye diameters as: AME, ALE, PME, PLE; and interdistances as: AME-AME, AME-ALE, PME-PME, PME-PLE, AME-PME, ALE-PLE. Positions of tegular appendages are given according to clock positions, based on the left male palp in ventral view. No distinctive spermathecae can be identified in the female internal duct system. Thus, we consider the "copulation duct" the part extending from the copulatory opening to the base of the glandular projection and the "spermathecae" the part extending from the base of the glandular projection to the fertilization duct. In schematic illustrations, the blind ending (glandular) appendage is marked with "T", the copulatory opening with a circle, and the end of the fertilization duct in direction of the *uterus externus* with an arrow. Coloration patterns are described based on specimens preserved in 70% ethanol. Species are listed in alphabetical order. Geographical coordinates of collection localities were obtained from the labels (given in parentheses) or from Google Earth (given in square brackets). The distribution map was prepared using the program DIVA-GIS, version 7.5.0.

Abbreviations used throughout the text: (AC) aciniform gland spigot; (ALE) anterior lateral eye; (AME) anterior median eye; (C) conductor; (CD) copulatory duct; (CO) copulatory opening; (E) embolus; (FD) fertilization duct; (GP) glandular projection; (HP) hood-like projection; (LL) lateral lobe; (MAP) major ampullate gland spigot; (mAP) minor ampullate gland spigot; (MS) median septum; (N) nubbin; (PI) piriform gland spigot; (PLE) posterior lateral eye; (PME) posterior median eye; (RTA) retrolateral tibial apophysis; (SP) spermathecae; (ST) subtegulum; (T) tartipore; (TG) tegular groove.

TAXONOMY

Sparassidae Bertkau, 1872

Nungara **gen. nov.**

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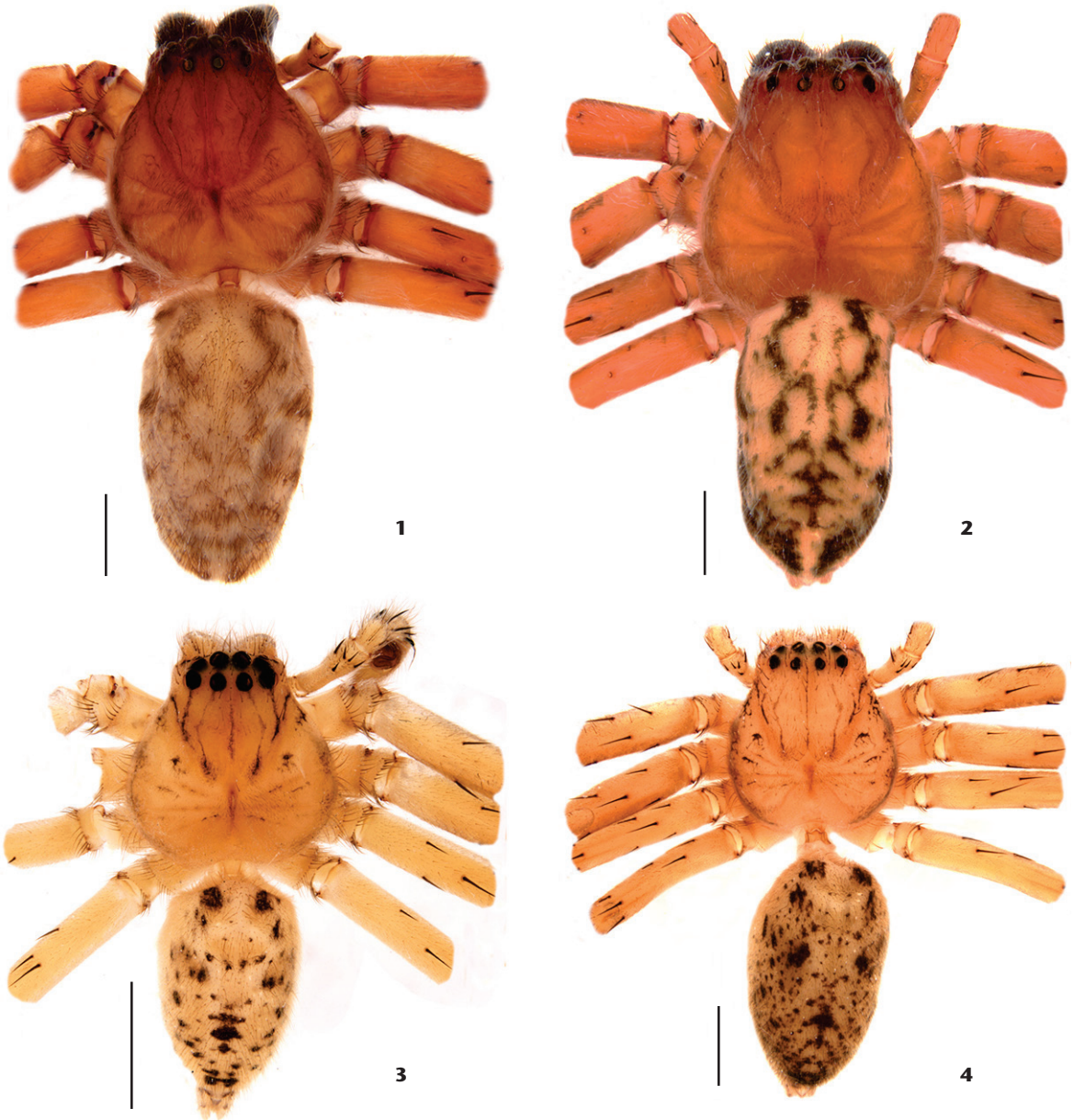
Type species. *Olios niveomaculatus* Mello-Leitão, 1941.

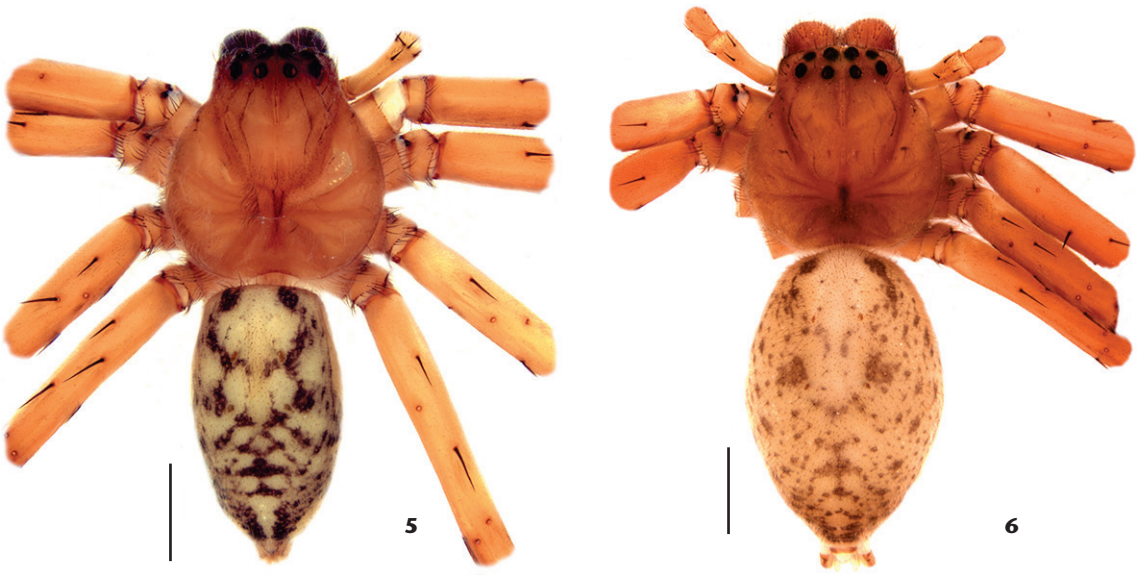
Diagnosis. Species of the genus *Nungara* **gen. nov.** resemble those of the Neotropical genera *Anaptomecus* Simon, 1903, *Sparianthina* Banks, 1929, *Guadana* Rheims, 2010 and *Caayguara* Rheims, 2010 in having three promarginal teeth and intermarginal denticles on the chelicerae (Fig. 7; Jäger et al. 2009: figs. 10, 89, 109; Rheims 2010a: fig. 7; 2010b: fig. 2; Guala et al. 2012: fig. 22). They are distinguished from *Anaptomecus*, *Sparianthina* and *Guadana* in having a short-toothed female pedipalp claw (Fig. 16) (long-toothed in the latter genera, see Jäger et al. 2009: figs. 13, 64; Rheims 2010a: fig. 9) and from all four genera in having three pairs of ventral spines on tibiae I-II (four in *Anaptomecus*, *Sparianthina* and *Guadana* and two in *Caayguara*) and 4-6 strong setae at the base of fang (Fig. 7) (only one in the latter genera, see Rheims 2010a: fig. 7; 2010b: fig. 2; Guala et al. 2012: figs. 19-20). Additionally, species of *Nungara* **gen. nov.** can be distinguished from those of all known Neotropical genera by the presence of a deep tegular groove on the male palp (Figs. 28, 39, 50) and a hood-like projection on the median septum of the female epigyne (Figs. 30, 41, 52).

Description. Total length: males 6.0-15.4, females 6.1-14.0. Prosoma slightly longer than wide; cephalic region slightly higher than thoracic region, sloping posteriorly; fovea conspicuous on posterior third of prosoma; eyes arranged in two rows, both straight or very slightly procurved; AME larger than or as large as ALE and more distant from each other than from ALE; PME smaller than PLE and more distant or closer to each other than to PLE (Figs. 1-6); clypeus low, less than AME diameter. Chelicerae longer than wide with three promarginal teeth, the median one largest, and four retromarginal teeth, the basal one smallest; intermarginal denticles present at base of furrow; six strong setae at base of fang (Fig. 7). Labium slightly longer than wide. Endites parallel, longer than wide, with dense scopulae on internal margin; serrula with a

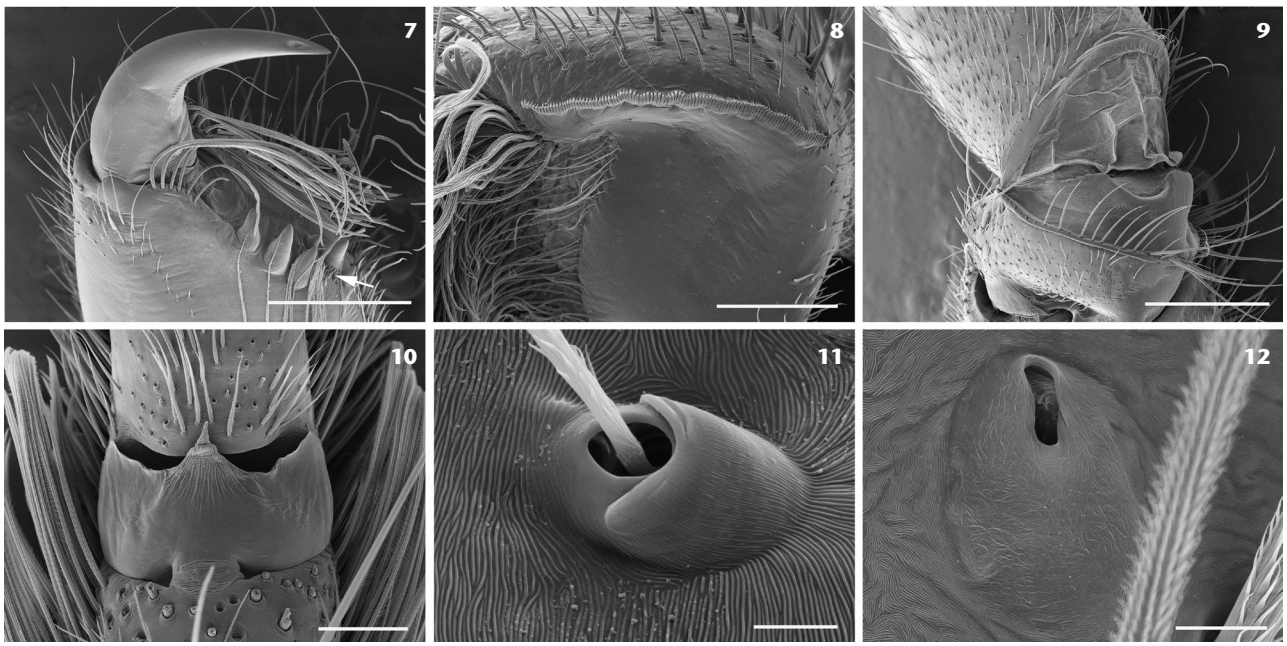


Figures 1-4. Dorsal habitus. 1-2; *Nungara anama* **sp. nov.**; (1) male, IBSP 12926, (2) female, IBSP 7599. 3-4 *Nungara gaturama* **sp. nov.** (3) male, IBSP 63333, (4) female, IBSP 135140. Scale bars: 1 mm

single row of denticles (Fig. 8). Sternum slightly longer than wide, very slightly projected between coxae IV. Legs laterigrade (2143); trochanter I-IV strongly notched (Fig. 9); metatarsi I-IV with distal dorsal trilobate membrane with median lobe as large or slightly larger than lateral projections (Fig. 10); trichobothria present on dorsum of tibiae, metatarsi and tarsi, arranged in several rows on tarsi and converging to a single row on metatarsi; bothrium with elliptical dorsal plate, with one or two distal grooves, projecting over smooth basal plate (Fig. 11); tarsal organ capsulate with keyhole-shaped opening, located dorsally at the distal end of tarsi (Fig. 12); tarsi with pair of pectinate claws with one strongly curved main tooth followed by 12-18 secondary, slightly curved, smaller teeth (Figs. 13-14); claw tufts with distally bifid hairs (Fig. 15); spination in males: femur I-IV: p1-1-1; d0-1-1; r1-1-1; patellae: I-IV p1; r1; tibiae: I–II: p1-0-1; d1-1-1; r1-0-1; v2-2-2; tibiae III–IV: p1-0-1; d0-0-0(1); r1-0-1; v2-2-2; metatarsi I–III: p1-1-0; r1-1-0;

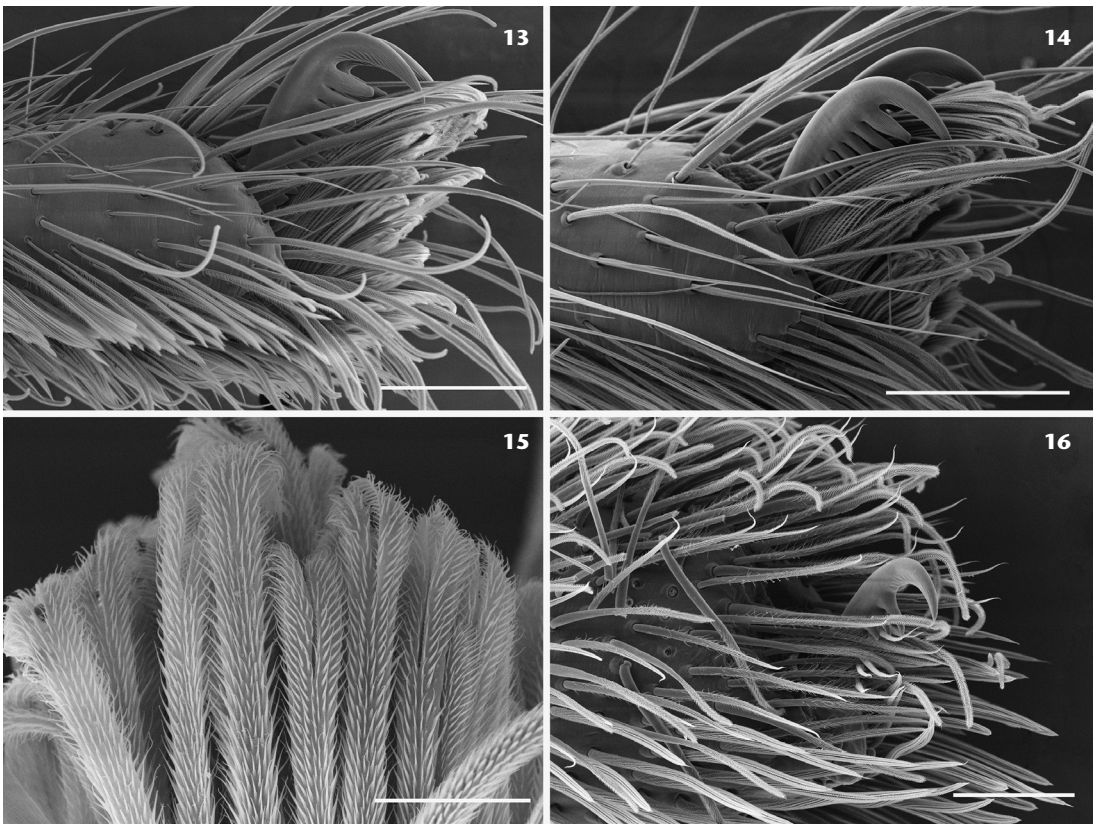


Figures 5-6. Dorsal habitus. *Nungara niveomaculata* (Mello-Leitão, 1941) **comb. nov.** (1) male, MNRJ 43275, (2) female, MNRJ 13331. Scale bars: 1 mm.



Figures 7-12. *Nungara gaturama* **sp. nov.** (7) female, MNRJ 1681, right chelicerae, ventral view (arrow indicating intermarginal denticles); (8) female, MNRJ 1695, left endite, serrula, ventral view; (9) male, MNRJ 1690, leg I, trochanter, dorsal view; (10) male, MNRJ 1690, leg I, metatarsus, trilobate membrane, dorsal view; (11) female, MNRJ 1685, leg I, tarsus, trichobothria, dorsal view; (12) male, MNRJ 1690, leg I, tarsus, tarsal organ, dorsal view. Scale bars: 7, 9 = 500 µm; 8 = 200 µm; 10 = 100 µm; 11 = 5 µm; 12 = 10 µm.

v2-2-0; metatarsus IV: p1-1-2; r1-1-2; v2-2-0; palp: femur: p0-0-1; d0-1-2; r0-0-1; patella: p1; r1; tibia: p2-1-0; d1-0-0; r1-1-0; spination in females: as in males except tibia I-IV: d0 and palp tarsus: p2-1-0; r2-1-0. Female palps with a single pectinate claw, with one strong distal tooth followed by 6-10 shorter and slightly curved secondary teeth (Fig. 16); sensory setae long, distally curved, with barbules

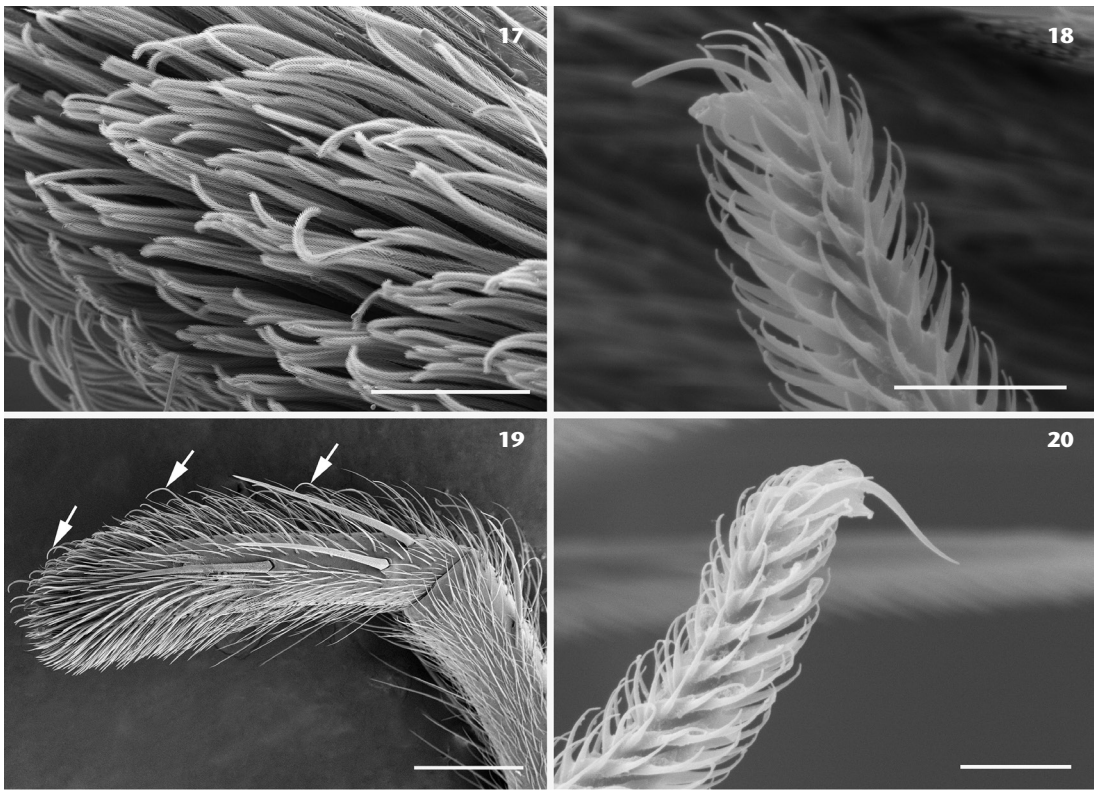


Figures 13-16. *Nungara gaturama* **sp. nov.**; (13) male, MNRJ 1687, leg I, claws, retrolateral view (14) male, MNRJ 1718, leg IV, claws, prolateral view (15) male, MNRJ 1690, leg I, tarsos, claw tufts (16) female, MNRJ 1685, pedipalp, claw, retrolateral view. Scale bars: 13-14 = 200 µm, 15 = 30 µm, 16 = 100 µm.

along the entire setae and with distal region bearing a large pore and a single filiform extension (Fig. 20), distributed sparsely along dorsal surface of tarsus (Fig. 19). Opisthosoma oval, longer than wide; male epiandrous region with scattered epiandrous spigots; tracheal spiracle single, contiguous to spinnerets; anal tubercle small, triangular with few terminal hairs. Six spinnerets: ALS contiguous, conical, bisegmented, distal segment bearing 20-25 piriform gland spigots in males and females, one major ampullate gland spigot and one nubbin in males (Fig. 21) and two major ampullate gland spigots in females (Fig. 24); PMS short and truncate with 3-5 cylindrical gland spigots and 10-15 aciniform gland spigots in males and females, one minor ampullate gland spigot and one tartipore in males (Fig. 22) and two minor ampullate gland spigots in females (Fig. 25); PLS conical, bisegmented, distal segment bearing 20-25 aciniform gland spigots (Figs. 23, 26). Male palp: tibia as long as cymbium with three prolateral, one dorsal and two retrolateral spines (Figs. 27-29); RTA simple, arising distally from retrolateral tibia (Figs. 28, 39, 50); cymbium slightly elongate with oval, ventral alveolus and dorsal scopulae of long, distally curved sensory setae, with barbules along the entire setae and with distal region bearing a large pore and an single filiform extension (Figs. 17-18); tegulum rounded with strong tegular groove, longitudinal (Fig. 39) or C-shaped (Figs. 28, 50); embolus filiform, with no projections, arising from tegulum between 2-6 o'clock positions; conductor membranous, gutter-shaped (Figs. 28, 39, 50). Female epigyne: epigynal plate of variable shape, usually as wide as long; lateral lobes simple, without projections, partially covering the median septum; median septum of variable shapes bearing a pair of anterior copulatory openings and a median hood-like projection (Figs. 30, 41, 52). Female vulva: internal duct system with copulatory ducts short; glandular projection large, slightly cylindrical, arising close to the copulatory openings; spermathecae long, convoluted; fertilization ducts short, hook-shaped and anterio-laterad (Figs. 31-32, 42-43, 53-54).

Distribution. Known from western Ecuador (state of Esmeraldas) and northern to southern Brazil, (states of Pará, Maranhão, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Mato Grosso, Bahia, Minas Gerais, Espírito Santo, São Paulo and Rio Grande do Sul) (Fig. 60).

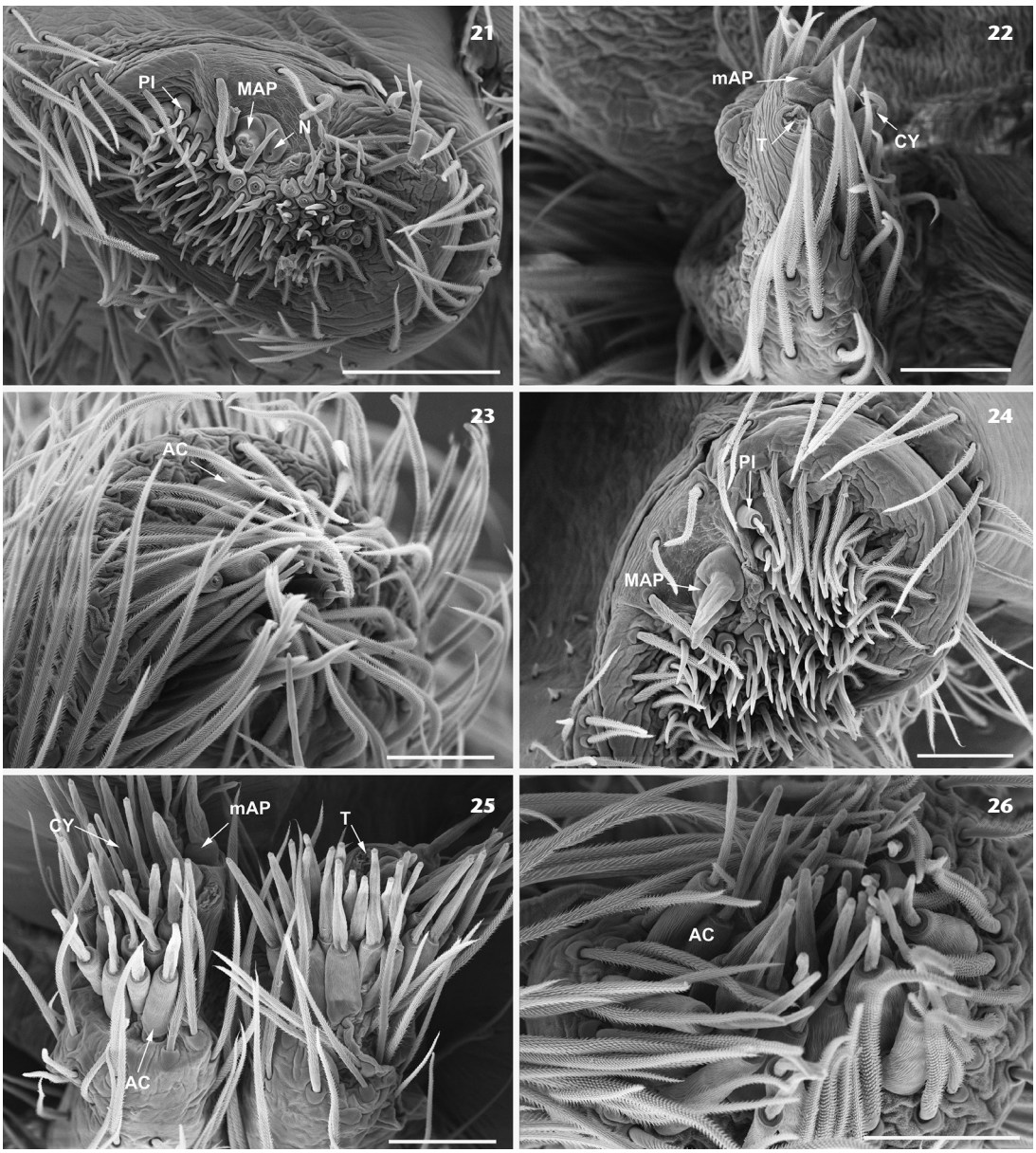
Composition. Three species: *Nungara niveomaculata* (Mello-Leitão, 1941) **comb. nov.**; *Nungara gaturama* **sp. nov.**; *Nungara anama* **sp. nov.**



Figures 17-20. *Nungara gaturama* **sp. nov.**; 17-18 male, MNRJ 1718, (17) left palp, cymbium, sensory scopula, dorsal view; (18) ditto, sensory setae, detail; 19-20 female, MNRJ 1681 (19) left pedipalp, prolateral view (arrows indicating sensory setae); (20) ditto, sensory setae, detail. Scale bars: 17 = 50 µm, 18, 20 = 5 µm, 19 = 500 µm.

Etymology. The specific name is a noun from the Tupi Indian Language meaning "equal, similar" and refers to the strong similarity between the species genitalia. Gender is feminine.

Remarks. Based on previous subfamilial classifications (Simon 1897, 1903, Hogg 1903, Järvi 1912, 1914, Petrunkevitch 1928, Roewer 1954, Jäger 1998) and unpublished morphological evidences, Moradmand et al. (2014: fig. 1) reported the current classification concept for all known genera of Sparassidae. Heteropodinae appears divided into two groups. The core group, Heteropodinae sensu stricto, includes the Australasian and African genera while the Neotropical genera, *Anaptomecus*, *Sparianthina*, *Guadana* and *Caayguara* group under Heteropodinae sensu latu. In this paper, the authors investigated the phylogeny of Sparassidae using four molecular markers. However, the sampling included only two Neotropical representatives, *Polybetes pythagoricus* (Holmberg, 1875) and *Olios* cf. *sanctivicenti* (Simon, 1897). The latter species belongs to an unknown genus, currently misplaced in *Olios*, and shares with *Nungara* **gen. nov.** the presence of three promarginal teeth and intermarginal denticles on the chelicerae, a short-toothed female pedipalp claw and three pairs of ventral spines on tibiae I-II. Their results show *O.* cf. *santivicenti* sister to *P. pythagoricus*, at the base of a large clade, sister to Heteropodinae *sensu strictu* (see Moradmand et al. 2014: fig. 3). Based on these evidences the authors classify *O.* cf. *sanctivicenti* as Heteropodinae sensu latu. However, no representatives of *Anaptomecus*, *Sparianthina*, *Guadana* or *Caayguara* were included in this analysis and the relationship between these genera, *Nungara* **gen. nov.** and *O.* cf. *sanctivicenti* remains unresolved. Thus, taking into account the morphological aspects of these genera and species, Heteropodinae sensu latu should include only *Anaptomecus*, *Sparianthina* and *Guadana*. These genera share with Heteropodinae sensu strictu the long-toothed female pedipalp claw, the presence of four pairs of ventral spines on tibiae I-II and a single strong setae at the base of fang (see Jäger et al. 2009: figs. 10, 89, 109; Rheims 2010a: fig. 7; Guala et al. 2012: fig. 22). *Nungara* **gen. nov.**, *Caayguara* and *O.* cf. *sanctivicenti*, all with a short-toothed female pedipalp claw, two or three pairs of ventral spines on tibiae I-II and more than five strong setae at the base of fang (see Figs. 7, 16; Rheims 2010b: figs. 2, 7), should be excluded from Heteropodinae sensu latu. Nevertheless, their relationship to one another as well as their placement within Sparassidae remains unresolved until a more comprehensive analysis, including more Neotropical representatives, is conducted.



Figures 21-26. *Nungara gaturama* **sp. nov.**; 21-23 male, MNRJ 1687, spinnerets (21) anterior lateral spinneret; (22) posterior median spinneret; (23) posterior lateral spinneret. 24-26 female, MNRJ 1681, spinnerets (24) anterior lateral spinneret; (25) posterior median spinneret; (26) posterior lateral spinneret. (AC = aciniform gland spigot; CY = cylindrical gland spigot; MAP = major ampullate gland spigot; mAP = minor ampullate gland spigot; N = nubbin; PI = piriform gland spigot; T = tartipore). Scale bars: 21 = 100 µm, 22-26 = 50 µm.

Nungara anama **sp. nov.**

Figs. 1-2, 27-37, 60

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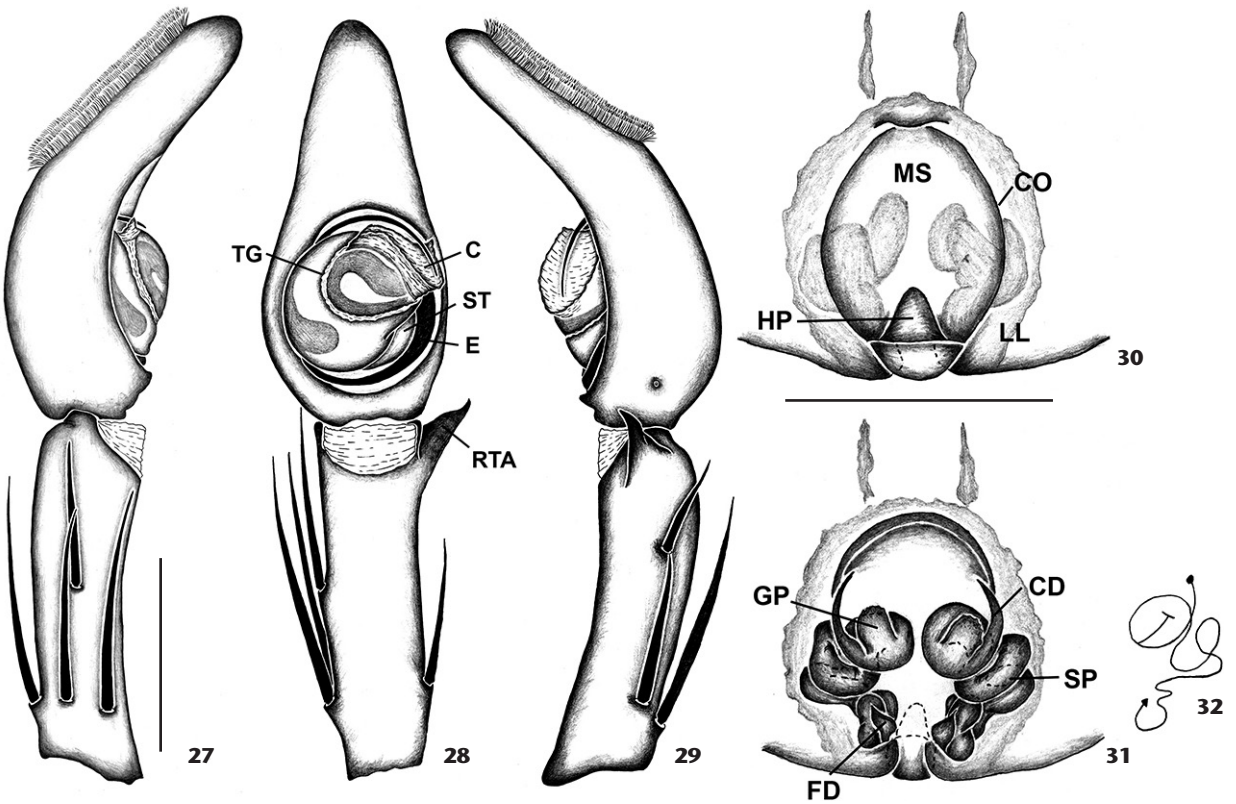
Diagnosis. Males of *N. anama* **sp. nov.** resemble those of *N. niveomaculata* **comb. nov.** by the palp with a C-shaped tegular groove (Figs. 28, 34, 50, 56) (longitudinal in *N. gaturama* **sp. nov.**, see Fig. 39). They are distinguished from this species by tegulum indented retrolaterally at the groove leaving the subtegulum visible in ventral view and by the embolus arising from tegulum at 2 o'clock position (Figs. 28, 34) (6 o'clock in *N. gaturama* **sp. nov.**, 3 o'clock in *N. niveomaculata* **comb. nov.**, see Figs. 39, 50). Females are distinguished from those of the remaining species of the genus by the epigyne with median septum oval, widest in



Figures 27-32. *Nungara anama* **sp. nov.** 27-29 male, IBSP 134951, left palp (27) prolateral view; (28) ventral view; (29) retrolateral view. 30-32 female, IBSP 7599, (30) epigyne, ventral view; (31) vulva, dorsal view; (32) schematic course of internal duct system (C = conductor; CO = copulatory opening; E = embolus; FD = fertilization duct; GP = glandular projection; HP = hood-like projection; LL = lateral lobe; MS = median septum; RTA = retrolateral tibial apophysis; SP = spermathecae; ST = subtegulum; TG = tegular groove). Scale bars: 1 mm.

the median section (Figs. 30, 36) (oblong in *N. gaturama* **sp. nov.**, subtriangular in *N. niveomaculata* **comb. nov.**, see Figs. 41, 52).

Description. Male (IBSP 134951). Prosoma brown; fovea dark brown; eye borders black. Chelicerae brown with three longitudinal black stripes. Legs and palps brown, tarsi and metatarsi darker. Labium and endites brown, distally translucent white. Sternum brown with darker margins. Opisthosoma cream colored; dorsally with faded, indistinct pale brown pattern (Fig. 1). Total length 12.6. Prosoma: 5.6 long, 4.8 wide. Opisthosoma: 6.6 long, 4.3 wide. Eyes: diameters: 0.38, 0.32, 0.21, 0.33 interdistances: 0.26, 0.11, 0.36, 0.35, 0.23, 0.15. Legs: I: 29.9 (8.0, 2.9, 8.5, 8.4, 2.1); II: 32.1 (8.9, 3.0, 9.3, 8.9, 2.0); III: 20.4 (6.2, 2.1, 5.6, 5.0, 1.5); IV: 23.9 (7.2, 2.2, 6.2, 6.4, 1.9). Palp: RTA acuminate, with long slightly curved tip in ventral view, triangular with a wide base in retrolateral view (Figs. 27-29, 33-35).

Female (IBSP 7599). Coloration pattern as in male, slightly lighter and with opisthosoma with dorsal pattern of brown irregular marks laterally and median triangular marks down posterior half (Fig. 2). Total length 14.6. Prosoma: 6.5 long, 6.1 wide. Opisthosoma: 8.1 long, 5.0 wide. Eyes: diameters: 0.45, 0.39, 0.34, 0.38 interdistances: 0.45, 0.34, 0.62, 0.78, 0.40, 0.40. Legs: I: 28.1 (8.1, 3.1, 7.5, 7.7, 1.7); II: 28.6 (8.2, 3.6, 7.3, 7.7, 1.8); III: 20.0 (6.2, 2.6, 5.1, 4.7, 1.4); IV: 23.2 (7.0, 2.6, 5.8, 6.0, 1.8). Epigyne: epigynal plate as wide as long; median septum one and a half times longer than wide; hood-like projection triangular, slightly wider than long (Figs. 30, 36). Vulva: glandular projection anterio-laterad, one and a half times longer than wide (Figs. 31-32, 37).

Variation. Males (n = 9): total length: 11.0-15.9; prosoma length: 4.9-7.2; femur I length: 8.0-10.1. Females (n = 2): total length: 13.1-14.6; prosoma length: 6.1-6.5; femur I length: 8.2-8.5.

Type material. Male holotype, Fazenda Cumurujipe, Mata de São João [12°32'04"S; 38°17'55"W], Bahia, Brazil, 2006, C. Machado leg. (IBSP 85276).

Paratypes. 3 males, Estação Ecológica de Murici (09°15'S, 35°51'W), Murici, Alagoas, Brazil, 13-22 September 2003, Equipe Biota leg. (IBSP 54430, 54431, 54565); 1 female, Mata do Crasto (11°23'S, 37°24'W), Santa Luzia do Itanhy, Sergipe, Brazil, 9-13 September 1999, A.D. Brescovit et al. leg. (IBSP 43271); 1 male, same locality, 12-14 November 1996, A.D. Brescovit & A.C.M. Fernandes leg. (IBSP 7530); 2 males, Reserva Biológica de Una, Una [15°11'S, 39°01'W], 15-28 November 2000, A.D. Brescovit et al. leg. (IBSP 45118, 47128); 1 male, Reserva Biológica do Córrego

Figures 33-37. *Nungara anama* **sp. nov.** 33-35 male IBSP 134951, left palp (33) prolateral view, (34) ventral view, (35) retrolateral view. 36-37 female, IBSP 43271 (36) epigyne, ventral view; (37) vulva, dorsal view. Scale bars: 1 mm.

do Veado (18°23'S, 40°11'W), Pinheiros, Espírito Santo, Brazil, 21-23 October 2005, T. Souza et al. leg. (IBSP 134951); 1 female, Linhares [19°23'S, 40°03'W], Reserva da Aracruz Celulose, June 1996, Alunos Universidade Estadual de Capinas leg. (IBSP 7599); 1 male, Linhares [19°23'S, 40°03'W], Reserva Florestal da Vale do Rio Doce, 19-25 July 1997, A.D. Brescovit et al. leg. (IBSP 12926).

Distribution. Known from northeastern and southeastern Brazil (States of Alagoas, Sergipe, Bahia and Espírito Santo) (Fig. 60).

Etymology. The specific name is a noun from the Tupi Indian language meaning "thick, wide" and refers to more robust and larger size of the spiders of this new species.

Nungara gaturama **sp. nov.**

Figs. 3-4, 7-26, 38-48, 60

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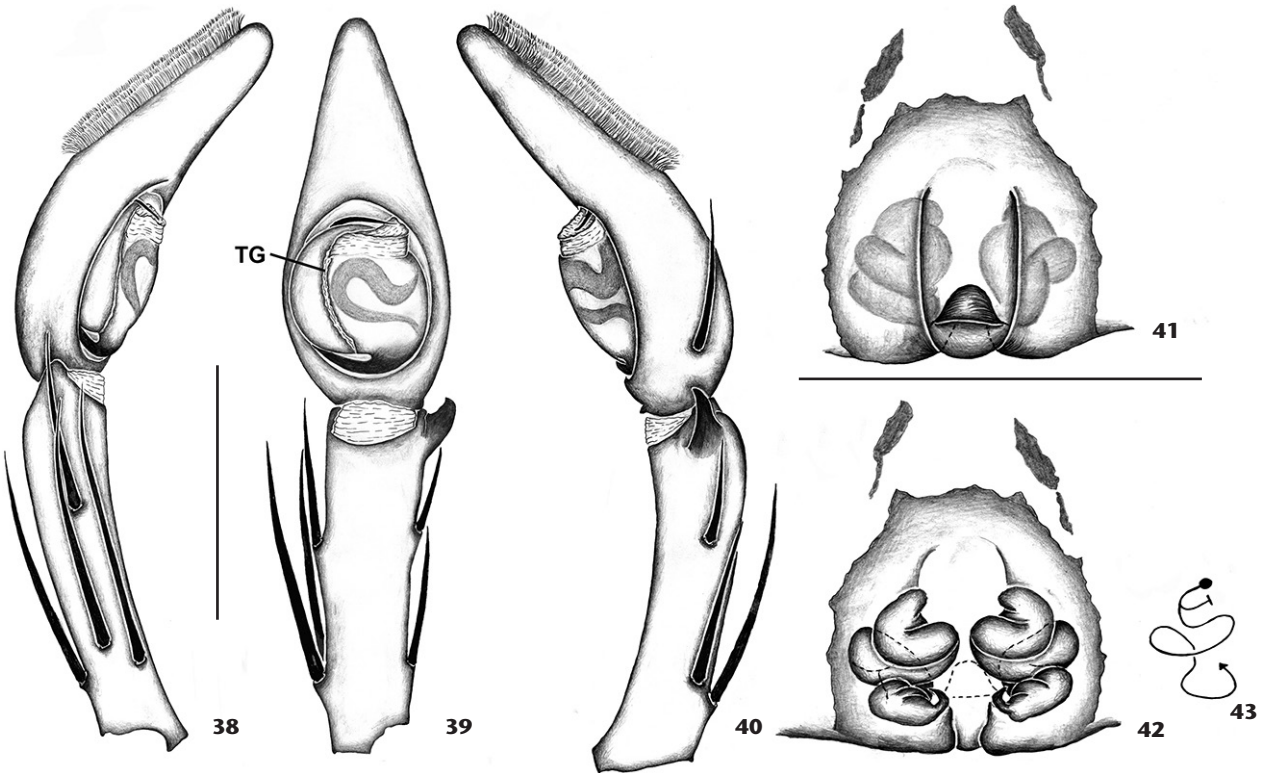
Diagnosis. Males of *N. gaturama* **sp. nov.** are distinguished from those of the remaining species of the genus by the palp with longitudinal tegular groove (C-shaped in the other species) and embolus arising from tegulum at 6 o'clock position (Figs. 39, 45) (2 o'clock in *N. anama* **sp. nov.**, 3 o'clock in *N. niveomaculata* **comb. nov.** see Figs. 28, 50). Females are distinguished by the epigyne with median septum oblong, with roughly the same width throughout its extension (Figs. 41, 47) (oval in *N. anama* **sp. nov.**, subtriangular in *N. niveomaculata* **comb. nov.** see Figs. 30, 52).

Description. Male (IBSP 54319). Prosoma pale yellow, slightly darker at eye area and pale orange along lateral margins of cephalic region and thoracic striae, with fine lines extending posteriorly from behind PME and PLE; fovea pale brown; eye borders black. Chelicerae pale orange. Legs and palps pale orange with tarsi and metatarsi darker. Labium and endites cream colored, distally translucent white. Sternum cream colored with margins slightly more sclerotized and darker. Opisthosoma cream colored; dorsally with brown pattern of spots laterally and median irregular marks down posterior half (Fig. 3). Total length: 8.9. Prosoma: 3.9 long, 3.8 wide. Opisthosoma: 4.9 long, 2.8 wide. Eyes: diameters: 0.35, 0.29, 0.23, 0.30; interdistances: 0.24, 0.10, 0.40, 0.35, 0.25, 0.15. Legs: I: 26.7 (7.1, 2.3, 7.9, 7.5, 1.9); II: 29.2 (8.0, 2.4, 8.7, 8.0, 2.1); III: 17.2 (5.4, 1.5, 4.7, 4.3, 1.3); IV: 20.1 (6.2, 1.6, 5.2, 5.6, 1.5). Palp: RTA with short, curved tip in ventral view, conical and gently curved ventrally in retrolateral view (Figs. 38-40, 44-46).

Female (IBSP 48255). Coloration pattern as in male, slightly darker and with more densely packed lateral spots (Fig. 4). Total length 11.3. Prosoma: 4.1 long, 4.4 wide. Opisthosoma: 6.9 long, 4.5 wide. Eyes: diameters: 0.35, 0.31, 0.22, 0.30; interdistances: 0.25, 0.20, 0.50, 0.49, 0.21, 0.30. Legs: I: 22.6 (6.3, 2.1,



Figures 38-43. *Nungara gaturama* **sp. nov.** 38-40 male, IBSP 48264, left palp (38) prolateral view, (39) ventral view, (40) retrolateral view. 41-43 female, IBSP 17920, (41) epigyne, ventral view; (42) vulva, dorsal view; (43) schematic course of internal duct system (TG = tegular groove). Scale bars: 1 mm.

6.6, 6.0, 1.6); II: 25.2 (7.0, 2.6, 7.2, 6.7, 1.7); III: 16.1 (4.9, 1.8, 4.3, 3.8, 1.3); IV: 19.0 (5.5, 1.9, 5.0, 5.1, 1.5). Epigyne: epigynal plate slightly longer than wide; median septum two times longer than wide; hood-like projection mushroom cap-shaped, two times wider than long (Figs. 41, 47). Vulva: glandular projection cylindrical, as wide as long, anterio-mediad (Figs. 42-43, 48).

Variation. Males (n = 15): total length: 6.0-9.7; prosoma length: 2.8-4.5; femur I length: 5.4-8.2. Females (n = 15): total length: 7.3-14.0; prosoma length: 3.0-5.0; femur I length: 4.9-6.8.

Type material. Male holotype from Reserva Biológica de Una, Una [15°11'S, 39°01'W], Bahia, Brazil, 13 April 1998, A.D. Brescovit et al. leg. (IBSP 18343).

Paratypes. Female, Mata do Crasto (11°23'S, 37°24'W), Santa Luzia do Itanhy, Sergipe, Brazil, 9-13 September 1999, A.D. Brescovit et al. leg. (IBSP 43269); 2 males, 2 females, Parque Estadual de Itaúnas (18°25'S, 39°42'W), Conceição da Barra, Espírito Santo, Brazil, 15 December 2002-6 March 2003, Equipe Biota leg. (IBSP 54320, 54315, MZSP 70918, 70919); 1 female, Fazenda Engenho D'Agua, São Francisco do Conde [12°39'S, 38°35'W], Bahia, Brazil, 11 August 1968, Equipe Cepec-Ceplac leg. (MNRJ 6904); 1 male, Fazenda Mangabeira, Lomanto Júnior [14°48'S, 39°28'W], 12 July 1968, Equipe Cepec-Ceplac leg. (MNRJ 1701); 1 male, Fazenda Esperança, Camacan [15°25'S, 39°29'W], Bahia, Brazil, 7 June 1969, Equipe Cepec-Ceplac leg. (MNRJ 1683); 1 male, 1 female, Fazenda Pau Brasil, Itamarajú [17°02'S, 39°01'W], 13 March-20 June 1969, Equipe Cepec-Ceplac leg. (MNRJ 1730, 13298); 2 males, 3 females, with the same data as holotype (IBSP 45113, MZSP 70920-70923).

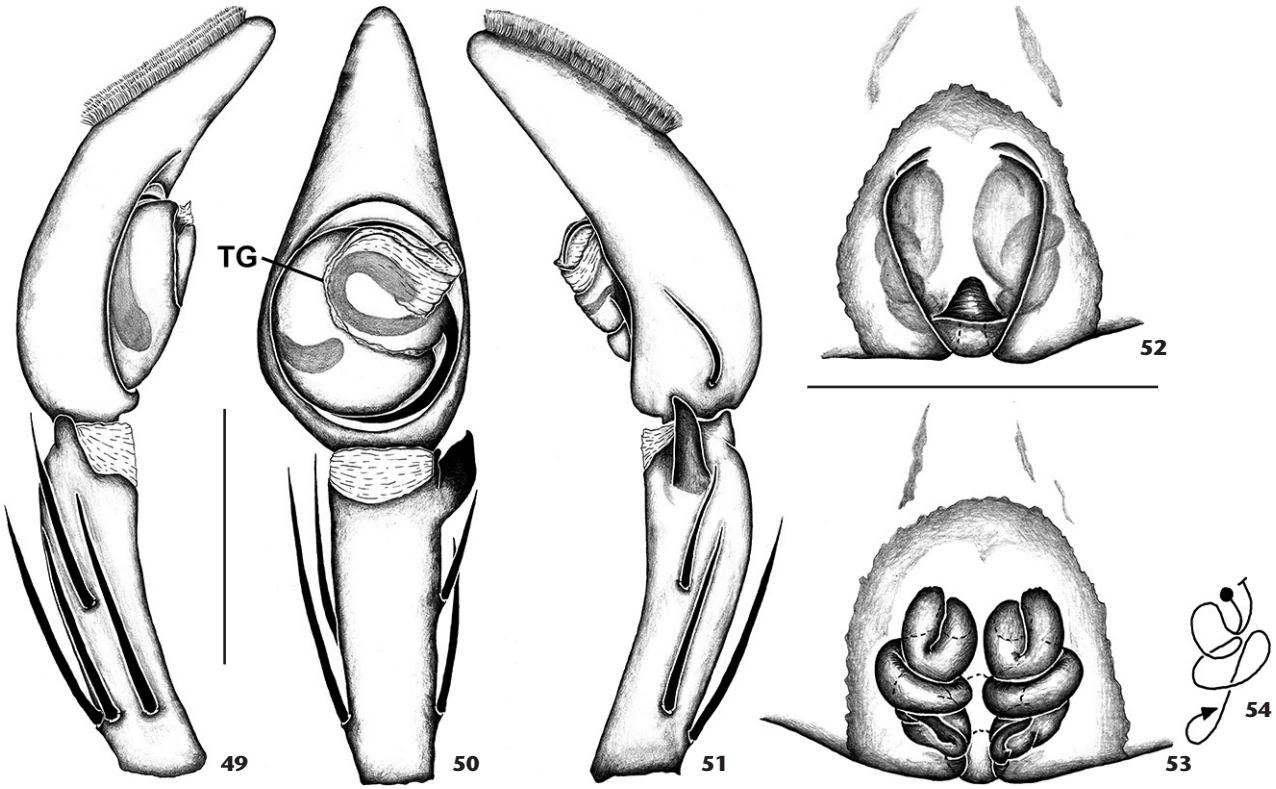
Additional material examined. Brazil. *Paraíba*: Mamanguape [06°50'S, 35°07'W], Área de Proteção Ambiental de Mamanguape, 1 female, 2001, C. Arzabe leg. (IBSP 39305). *Sergipe*: Santa Luzia do Itanhy, Mata do Crasto (11°23'S, 37°24'W), 4 males, 5 females, 9-13 September 1999, A.D. Brescovit et al. leg. (IBSP 43260-43268). *Bahia*: 5 males, 8 females, 41 juveniles, no date, Equipe Cepec-Ceplac leg. (MNRJ 1687, 1690, 1721); Ilhéus, Reserva do CEPLAC (14°46'22.7"S, 39°13'13.8"W), 1 female, 7 April 1998, A.D. Brescovit et al. leg. (IBSP 19109); 1 female, 8-9 December 2010, G.H.F. Azevedo & A.J. Santos leg. (UFMG 9486); Porto Seguro [01°02'S, 47°25'W], Estação Ecológica de Pau Brasil, 1 male, 20 April 998, A.D. Brescovit et al. leg. (IBSP 17956); Mata de São João [12°31'S, 38°18'W], Fazenda Cumurujipe, 2 males, 2006, C. Machado leg. (IBSP 85283, 85349); Salvador [12°58'S, 38°30'W], Cabula, Campus do 19° Batalhão de Caçadores, 1 male, 2005, C.M. Pinto Leite leg. (IBSP 71515); Jardim Botânico, 1 male,

Figures 44-48. *Nungara gaturama* **sp. nov.** 44-46 male, IBSP 48264, left palp (44) prolateral view; (45) ventral view; (46) retrolateral view. 47-48 female, IBSP 43267, (47) epigyne, ventral view; (48) vulva, dorsal view. Scale bars: 1 mm.

November 2005 - April 2006, A.O. Alves leg. (IBSP 63333); Gandu [13°44'S, 39°29'W], 2 males, 2 females, 18 juveniles, no date, Equipe Cepec-Ceplac leg. (MNRJ 1699, 1722); 1 female, 1973, A. Timotheo leg. (IBSP 3342); Fazenda São Rafael, 8 males, 3 females, 27 juveniles, 8 May 1969-14 March 1971, Equipe Cepec-Ceplac leg. (MNRJ 1681, 1688, 1718, 1724); Fazenda Pedra Branca, 8 males, 7 females, 12 juveniles, 18 December 1969-23 April 1970, Equipe Cepec-Ceplac leg. (MNRJ 1689, 1723, 13087, 13088, 13095); Fazenda Mineiro, 2 males, 5 females, 12 juveniles, 21 November 1970, Equipe Cepec-Ceplac leg. (MNRJ 1691, 1726); Fazenda Pau Brasil, 1 female, 1 August 1968, Equipe Cepec-Ceplac leg. (MNRJ 13090); Coaraci [14°38'S, 39°35'W], Fazenda Boa Esperança, 6 males, 10 females, 52 juveniles, 22 July-23 April 1971, Equipe Cepec-Ceplac leg. (MNRJ 1679, 1680, 1682, 1692, 1693, 1696, 1728); Uruçuca [14°39'S, 39°37'W], Fazenda Santa Tereza, 1 male, 1 female, 7 juveniles, 21 October 1969-25 March 1970, Equipe Cepec-Ceplac leg. (MNRJ 1695, 13094); Estação Experimental de Uruçuca, 1 male, 1 female, 19 August 1968, Equipe Cepec-Ceplac leg. (MNRJ 1705); Lomanto Junior [14°48'S, 39°28'W], Fazenda Mangabeira, 1 female, 5 juveniles, 29 May 1968, Equipe Cepec-Ceplac leg. (MNRJ 1719); Fazenda São José, 2 males, 5 females, 23 juveniles, 6 May 1969-15 September 1969, Equipe Cepec-Ceplac leg. (MNRJ 1685, 1694, 1704); Jussari [15°07'S, 39°30'W], Reserva Natural da Serra do Teimoso, 1 female, 8-9 April 1998, A.D. Brescovit et al. leg. (IBSP 18720); Fazenda São Francisco, 3 males, 24 October-24 November 1970, Equipe Cepec-Ceplac leg. (MNRJ 13096, 13112); Una [15°11'S, 39°01'W], Reserva Biológica de Una, 6 males, 12 females, 15-28 November 2000, A.D. Brescovit et al. leg. (IBSP 45099, 45101, 45103-45107, 45109-45111, 45114, 45116, 45130, 47121, 47998, 48255); Itamarajú [17°02'S, 39°01'W], Fazenda Pau Brasil, 3 males, 3 females, 18 juveniles, 9 May 1968-21 March 1971, Equipe Cepec-Ceplac leg. (MNRJ 1720, 1735, 13113, 13130, 13186); Prado [17°20'S, 39°13'W], Fazenda Furado, 4 females, 11 juveniles, 7 August-13 September 1970, Equipe Cepec-Ceplac leg. (MNRJ 1700). *Minas Gerais*: Poços de Caldas [21°47'S, 46°33'W], 1male, no date, no collector (MNRJ 1744). *Espírito Santo*: Linhares [19°23'S, 40°03'W], 1 male, 8 August 1968, Equipe Cepec-Ceplac leg. (MNRJ 1727). *São Paulo*: São José do Rio Pardo [21°35'S, 46°53'W], Fazenda Santa Helena, 1 male, 7 August 1969, D.G. Barreto leg. (IBSP 8573); Iguape [24°42'S, 47°33'W], 1 female, December 1987, no collector (MZSP 21381).

Distribution. Known from northeastern and southeastern Brazil (states of Paraíba, Sergipe, Bahia, Minas Gerais, Espírito Santo and São Paulo) (Fig. 60).

Etymology. The specific name is a noun from the Tupi indian language meaning "good omen".



Figures 49-54. *Nungara niveomaculata* (Mello-Leitão, 1941) **comb. nov.** 49-51 male, IBSP 17956, left palp (49) prolateral view; (50) ventral view; (51) retrolateral view. 52-54 female, IBSP 39305 (52) epigyne, ventral view; (53) vulva, dorsal view; (54) schematic course of internal duct system (TG = tegular groove). Scale bars: 1 mm.

Nungara niveomaculata (Mello-Leitão, 1941) **comb. nov.**

Figs. 5-6, 49-60

Olios niveomaculatus Mello-Leitão 1941: 125 (Female holotype from Esmeraldas [00°56' N, 79°40'W], Esmeraldas, Ecuador, no date, F. Campos leg., deposited in MNRJ 1394, examined). World Spider Catalog 2016.

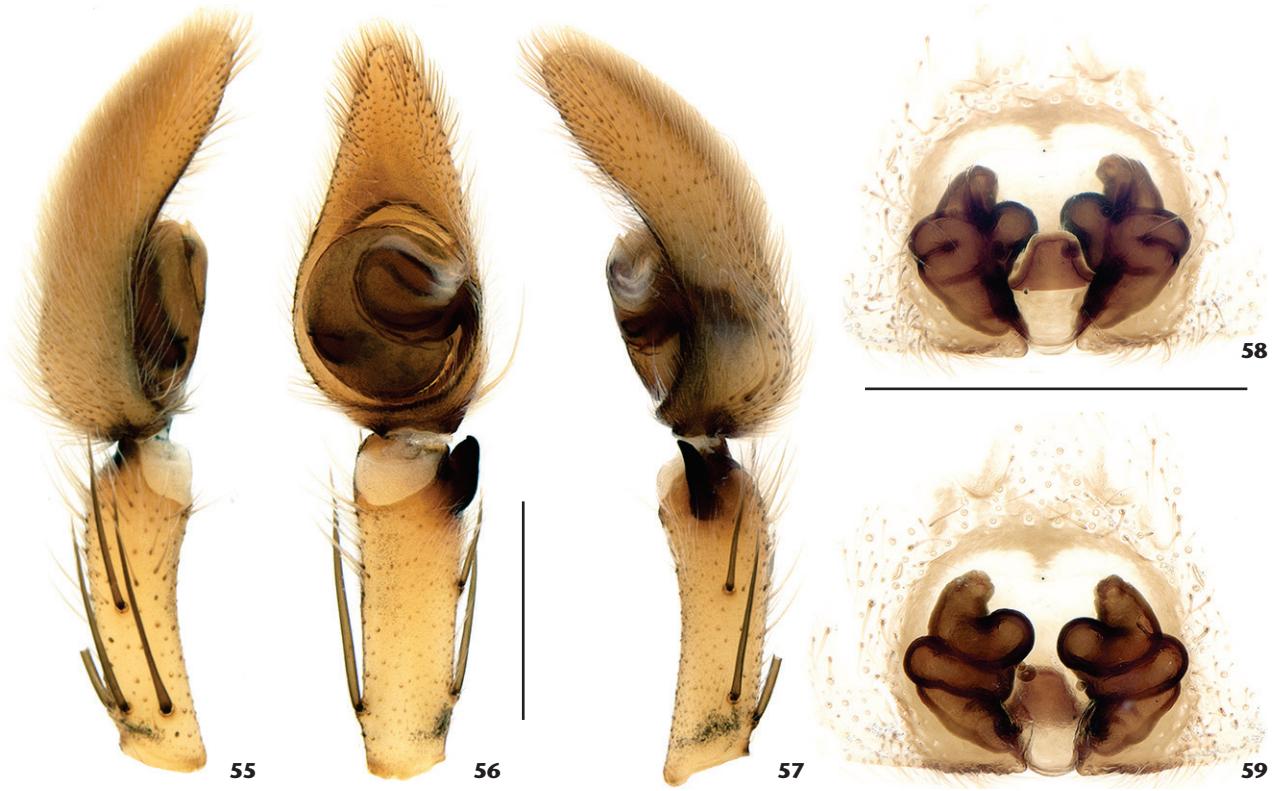
Olios fuscovariatus Mello-Leitão 1943a: 198 (Female holotype from Rio Grande do Sul, no specific locality, Brazil, no date. Pe. B. Rambo leg., deposited in MNRJ 42238, examined). World Spider Catalog 2016. **New synonymy**.

Polybetes proximus Mello-Leitão 1943b: 261 (male holotype from Campina Grande [07°13'S, 35°52'W], Paraíba, Brazil, no date, T. Leitão leg., deposited in MNRJ 1439, examined). World Spider Catalog 2016. **New synonymy**.

Stasina koluene Mello-Leitão 1949: 12 (female holotype from Koluene river, [uncertain locality], Mato Grosso, Brazil, April 1947, J.C. de M. Carvalho leg. deposited in MNRJ 1395, examined). World Spider Catalog 2016. **New synonymy**.

Diagnosis. Males of *Nungara niveomaculata* (Mello-Leitão) **comb. nov.** resemble those of *Nungara anama* **sp. nov.** by the palp with a C-shaped tegular groove (Figs. 28, 34, 50, 56) (longitudinal in *N. gaturama* **sp. nov.** see Fig. 39). They are distinguished from all other species of the genus by the embolus, arising from tegulum at 3 o'clock position (Figs. 50, 56) (2 o'clock in *N. anama* **sp. nov.**, 6 o'clock in *N. gaturama* **sp. nov.** see Figs. 28, 39). The females are distinguished from those of the remaining species of the genus by the epigyne with median septum subtriangular, widest anteriorly (Figs. 52, 58) (oval in *N. anama* **sp.nov.**, oblong in *N. gaturama* **sp. nov.** see Figs. 30, 41).

Redescription. Male (IBSP 54429). Prosoma dark orange, slightly darker along lateral margins of cephalic region and thoracic striae, with thin brown lines extending posteriorly from behind PME; fovea brown; eye borders black. Chelicerae dark orange. Legs and pedipalps orange, darker at tarsi and metatarsi. Labium and endites orange, distally translucent white. Sternum cream colored with slightly more sclerotized and darker margins. Opisthosoma cream colored; dorsally with brown pattern of irregular marks around cardiac mark and median chevron-like marks down posterior half (Fig. 5). Total length 8.0. Prosoma: 3.5 long, 3.5 wide. Opisthosoma: 4.4 long, 2.6 wide. Eyes: diameters: 0.31, 0.26, 0.23, 0.27; interdistances: 0.20, 0.11, 0.35, 0.20, 0.24, 0.07. Legs: I: 28.7 (7.5, 2.4, 8.5, 8.1, 2.2); II: 30.8 (8.2, 2.6, 9.1,



Figures 55-59. *Nungara niveomaculata* (Mello-Leitão, 1941) **comb. nov.** 55-57 male, IBSP 17956, left palp (55) prolateral view; (56) ventral view; (57) retrolateral view. 58-59 female, MPEG 0540, (58) epigyne, ventral view; (59) vulva, dorsal view. Scale bars: 1 mm.

8.7, 2.2); III: 19.6 (5.9, 1.8, 5.3, 5.0, 1.6); IV: 23.0 (6.7, 1.8, 6.3, 6.4, 1.8). Palp: RTA wide with short, gently curved tip in ventral view, long, bullet-shaped in retrolateral view (Figs. 27-29, 33-35).

Female (IBSP 45099). Coloration pattern as in male except labium and endites pale orange, distally translucent white and opisthosoma with dorsal pattern of brown spots laterally and chevron-like marks down posterior half (Fig. 6). Total length 12.4. Prosoma: 5.1 long, 4.4 wide. Opisthosoma: 7.0 long, 3.9 wide. Eyes: diameters: 0.30, 0.26, 0.21, 0.24; interdistances: 0.28, 0.16, 0.41, 0.20, 0.17, 0.07. Legs: I: 23.4 (6.5, 2.5, 6.7, 6.0, 1.7); II: 25.0 (7.0, 2.3, 7.6, 6.3, 1.8); III: 17.1 (5.0, 2.0, 4.8, 3.9, 1.4); IV: 19.4 (5.6, 1.9, 5.3, 5.1, 1.5). Epigyne: epigynal plate longer than wide; hood-like projection triangular slightly wider than long (Figs. 52, 58). Vulva: glandular projection almost three times longer than wide, anteriad (Figs. 53-54, 59).

Variation. Males (n = 15): total length: 7.4-11.3; prosoma length: 3.3-5.1; femur I length: 5.6-8.9. Females (n = 14): total length: 9.7-12.8; prosoma length: 4.2-5.2; femur I length: 5.0-6.9.

Additional material examined. Brazil: *Pará*: Margem Esquerda do Rio Tocantins, 1 female, 1984, W.L. Overal leg. (MPEG); Ourém [01°29'S, 47°10'W], Patauateua, 1 female, 15 September 2001, D.D. Guimarães leg. (MPEG 540); Paragominas [03°00'S, 47°21'W], Aldeia Yanaruhu, Igarapé Gurupi-Uma, 1 male, 1 female, 22-25 February 1996, B. Malkin leg. (IBSP 91729). *Maranhão*: Mirinzal (02°06'33.6"S, 44°50'48.9"W), 1 male, 10 August 2011, M.B. Aguiar Neto leg. (MPEG 30674); Rio Gurupiuna (02°34'S, 46°29'W), near Paragominas, Pará, 1 female, 2-30 May 1963, B. Malkin leg. (IBSP 91731); Caxias [04°51'S, 43°21'W], Reserva Ecológica de Inhamum, 1 male, 12-15 July 2006, G.A. Cunha leg. (IBSP 117272). *Rio Grande do Norte*: Baia Formosa [06°22'S, 35°00'W], Reserva Particular do Patrimônio Natural Mata Estrela, 1 female, 2003, R.G. Costa Jr. leg. (IBSP 44274). *Paraíba*: Areia, Reserva da Mata do Pau Ferro (06°57'S, 35°44'W), 5 males, 23-29 September 1999, A.D. Brescovit et al. leg. (IBSP 43286, 54459-54461, 54580); Mamanguape [06°50'S, 35°07'W], Área de Proteção Ambiental da Barra do Rio Mamanguape, 1 male, July 2001, G. Skuk leg. (IBSP 55811); Cabedelo, Ilha da Restinga [07°00'S, 34°51'W], 1 female, 24 August 1977, P.F.L. Duarte leg. (UFPB 138); João Pessoa, Mata do Buraquinho [07°08'S, 34°51'W], 5 males, 1 female, October 2003-June 2004, S.C. Dias leg. (IBSP 99961-99962, 97191-97194). *Pernambuco*: 1 male, no date, Pe. Bento leg. (MNRJ 109); Recife [08°00'S, 34°57'W], Horto Dois Irmãos, 2 males, 3 females, 30 May-2 June 2001, Equipe Biota leg. (IBSP 98969, 98971-98973); 1 male, 13 September 1999, M. Peres leg. (IBSP 38637). *Alagoas*: Ipioca [09°30'S, 35°35'W], Serra da Saudinha, 1 female, 23 October 2004, G.Q.C. Correia leg. (IBSP 63836); Murici,

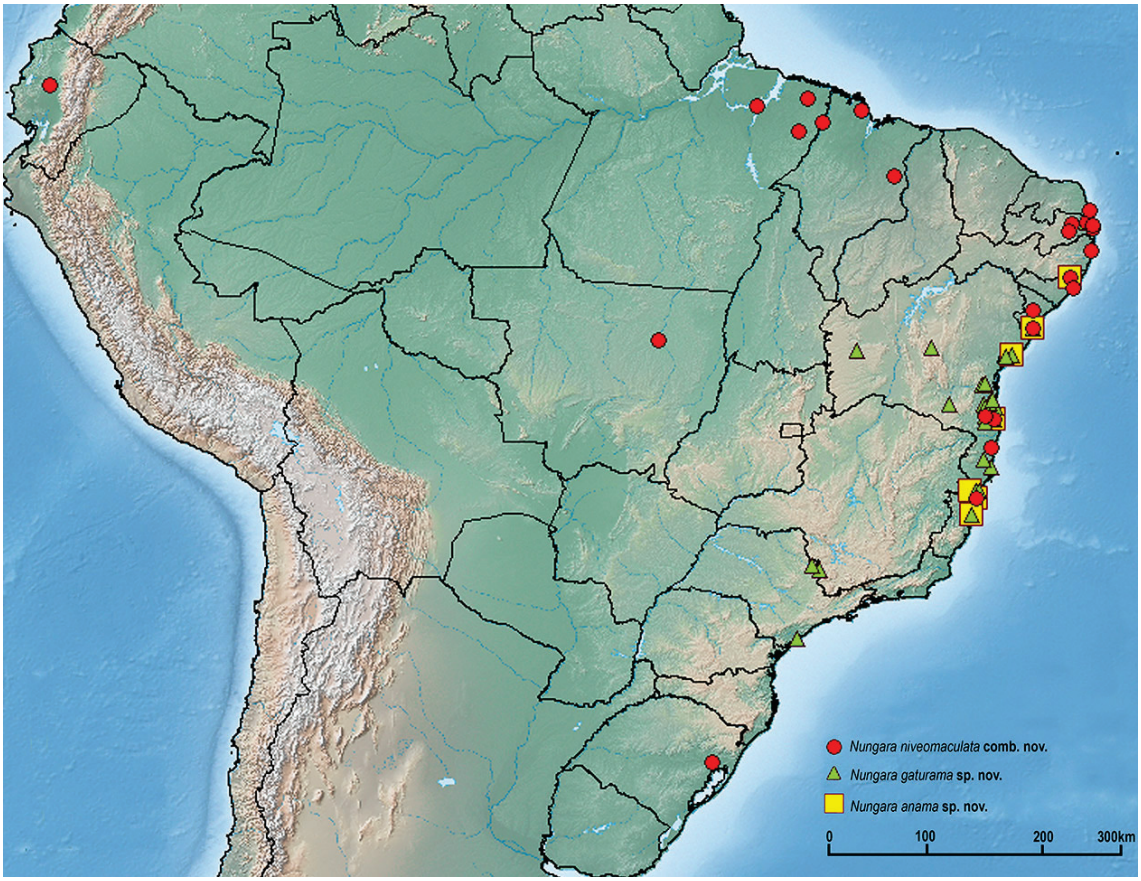


Figure 60. Distribution map for the known species of *Nungara* **gen. nov.**

Estação Ecológica de Murici (09°15'S, 35°51'W), 2 males, 13-22 September 2003, Equipe Biota leg. (IBSP 54428-54529); Maceió [09°38'S, 35°42'W], 1 female, January 2003, N.F. Lo Man Hung leg. (IBSP 36638). *Sergipe*: Itabaiana, Estação Ecológica da Serra de Itabaiana (10°40'S, 37°25'W), 3 males, 1 female, 14-20 September 1999, A.D. Brescovit et al. leg. (IBSP 43274-43276, 56259); 1 male, 19 July 2000, N. Zyngier leg. (IBSP 43393); Santa Luzia do Itanhy, Mata do Crasto (11°23'S, 37°24'W), 1 male, 9-13 September 1999, A.D. Brescovit et al. leg. (IBSP 168401); 1 male, 1 female, 1 juvenile, 12-14 November 1996, A.D. Brescovit & A.C.M. Fernandes leg. (IBSP 7529). *Bahia*: Porto Seguro [16°26'S, 39°03'W], Estação Ecológica de Pau Brasil, 1 female, 20 April 1998, A.D. Brescovit et al. leg. (IBSP 17920); Una [15°11'S, 39°01'W], Reserva Biológica de Una, 1 male, 15-28 November 2000, A.D. Brescovit et al. leg. (IBSP 48264). *Espírito Santo*: São Mateus [19°23'S, 40°03'W], Reserva Florestal da Vale do Rio Doce, 1 male, 5-12 January 1998, A.D. Brescovit et al. leg. (IBSP 16509).

Distribution. Known from western Ecuador (state of Esmeraldas) and northern to southern Brazil, (states of Pará, Maranhão, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Mato Grosso, Bahia, Espírito Santo, São Paulo and Rio Grande do Sul) (Fig. 60).

ACKNOWLEDGEMENTS

This study was supported by Fundação de Amparo à Pesquisa de São Paulo (FAPESP 2015/08020-6 to ECP; 2015/18982-0 to CAR). We wish to thank Beatriz Mauricio (Laboratório de Biologia Celular, Instituto Butantan) for help with the Scanning Electron Micrographs and Peter Jäger (Senckenberg Research Institute and Museum, Frankfurt a. Main, Germany) and Majid Moradmand (University of Isfahan, Isfahan, Iran) for comments that greatly improved the quality of this manuscript.

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Submitted: 6 September 2016
Received in revised form: 26 October 2016
Accepted: 2 November 2016
Editorial responsibility: Ricardo Pinto da Rocha

Author Contributions: ECP produced all images (drawings, photos, SEMs and map) and descriptions; ECP and CAR examined material and wrote the text; CAR assembled the plates and reviewed the English language.
Competing Interests: The authors have declared that no competing interests exist.