Formiciform Salticidae (Araneae). Two new combinations and four new species of the genera *Martella* and *Sarinda*

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Formiciform Salticidae (Araneae). Two new combinations and four new species of the genera Martella *and* Sarinda.–Female specimens of *Sarinda utingae* Galiano, 1967 and *Sarinda camba* Galiano, 1969 are described for the first time and the species are transferred to *Martella* as new combinations. Three new species of *Martella* from Brazil and one species of *Sarinda* from Argentina are described. The main diagnostic character separating *Martella* from *Sarinda* is the structure of the female internal genitalia.

Key words: Araneae, Salticidae, *Martella, Sarinda*, Argentine, Brazil.

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Introduction

The ant-like genera *Sarinda* Peckham & Peckham, 1892 and *Martella* Peckham & Peckham, 1892 have been revised in previous papers (GALIANO, 1964, 1965, 1967, 1969). Several species have been found in association with black ants [*S. marcosi* Toledo Piza, 1937, *S. nigra* Peckham & Peckham, 1892, *S. imitans* Galiano, 1965, *S. camba* Galiano, 1965 (GALIANO, 1965, 1969), *Martella furva* (Chickering, 1946) (REISKIND, 1977)] and are considered Batesian mimics (REISKIND, 1977). The spiders of both genera have a black body with the cephalic region being higher than the thoracic region and separated from it by a transverse band of white hairs. *Sarinda* species have an elongated body, abdominal constriction and one or more transverse yellow bands, while those of *Martella* lack ab-

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dominal constriction but may have transverse bands. The legs are slender and the female palps are greatly large and palette-shaped with dense fringes of dark hairs.

Sarinda presently contains 18 species and *Martella* includes seven species. It is probable that some of the eight species of *Sarinda* and the six of *Martella* represented by one sex only will eventually prove to be male/female of the same species. The ant-like appearance of these spiders makes it difficult to assign the species to genus. At present, the two genera are separated mainly by genitalic characters.

In this paper, supplemental information about *Martella* is given. The females of *Sarinda utingae* and *Sarinda camba* are described for the first time and on the basis of their epigynal conformation, the species are transferred to *Martella* as new combinations. Four other new species are described: *Sarinda chacoensis* n. sp. from Argentina; *Martella pasteuri* n. sp., *Martella amapa* n. sp. and *Martella gandu* n. sp. from Brazil.

Material and methods

The format of descriptions follows GALIANO (1963); leg spination is described as in PLATNICK & SHADAB (1975) with minor changes. The specimens were frozen during copulation with a mixture of carbon dioxide and ether and then preserved in ethanol 70°.

Abbreviations: AME. Anterior median eyes; ALE. Anterior lateral eyes; PME. Posterior median eyes; PLE. Posterior lateral eyes. v. Ventral; p. Prolateral; r. Retrolateral; ap. Apical. MACN. Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia'; MNRJ. Museu Nacional de Rio de Janeiro; CEPEC. Centro de Pesquisas do Cacau, Bahia, Brazil.

Systematics

Martella utingae (Galiano, 1967) n. comb. (figs. 1-4, 22)

Sarinda utingae Galiano 1967: 29, figs. 1-7 (male holotypus N° 5972 MACN from Brazil, Pará, Belém: Utinga, col. Galiano, VI 1966, examined); Brignoli, 1983: 654; Prószynski, 1990: 315.

Description

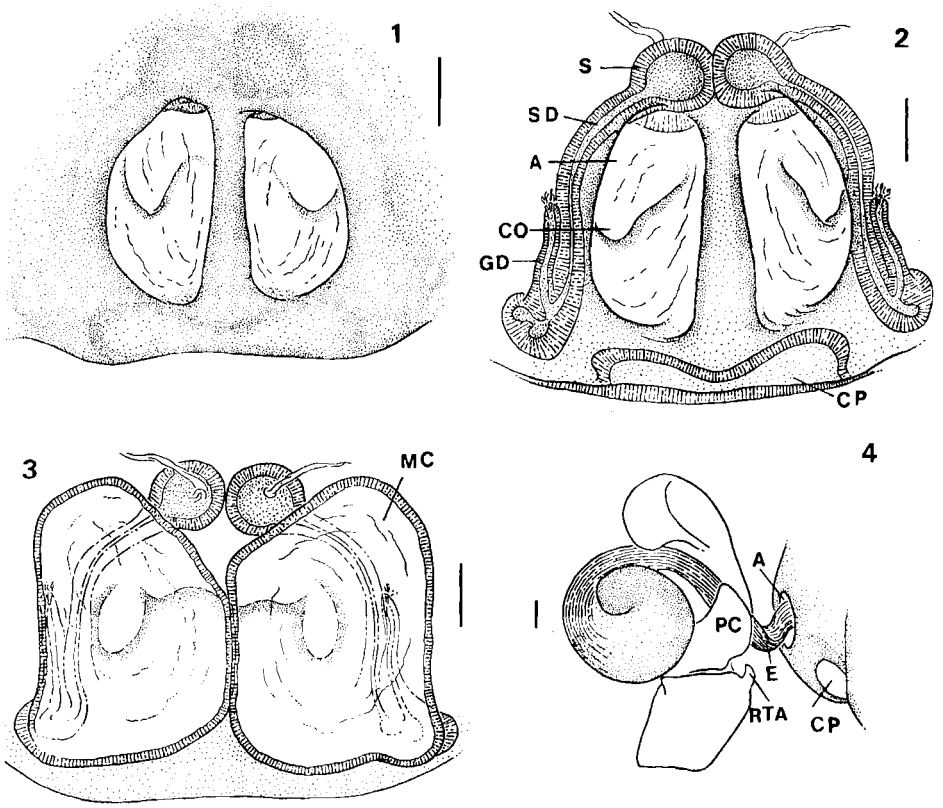
Female. Total length 4.65 mm. Carapace length 1.87 mm, width 1.20 mm, height 0.93 mm. Ocular quadrangle length 0.80 mm, first row width 1.18 mm, third row width 1.20 mm. Distances ALE-PME 0.22 mm, PME-PLE 0.18 mm. AME diameter 0.42 mm. Clypeus height 0.05 mm. Chelicerae: promargin with five teeth, retromargin with three. Legs IV-I-III-II. Leg spination: femora and patellae I-IV 0. Tibiae I v 2-2-2-2-2; II v 2-2-2; III, IV 0. Metatarsi I, II v 2-2; III p 1-1; IV p 1ap, r 1ap. Epigynum (figs. 1-3): posterior border with a large copulatory pocket, wider on each side; two large oval atria with sclerotized rims, separated by a septum. Large copulatory openings, followed by a very large membranous compartment dilated posteriorly and ectad from which the spermathecal and glandular ducts originate. The internal structure of the epigynum of *M. utingae* bears close resemblance with that of *M. maria* Peckham & Peckham, 1892, but differs in the form of the membranous compartment.

Note

Living specimens were kept at the laboratory in Buenos Aires, where behaviour and mating were observed. Copulation took place on the walls of the bottle, outside the nest. One were frozen while mating. The position of the different structures was observed in these preserved specimens (fig. 4). The retrolateral tibial apophysis of the palp is engaged on the extreme side of the copulatory pocket of the epigynum. The inflation of the basal haematodocha forces the tegulum out of the alveolus and also produces a rotation that places the embolus in the furrow formed between the cymbium and paracymbium. The embolic tip is inserted in the copulatory opening on the atrium (left palp on the left side of the epigynum). In this species the cymbium lacks ectal apophysis and the tip of the embolus is twisted (fig. 22).

Material examined

Brazil, Pará, Belém: Utinga, 5 ♀♀, 6 ♂♂ N° 9452 MACN, col. Galiano, VIII 1970; 2 , ♀♀, 8 ♂♂ N° 9453 MACN; 1 ♀, 4 ♂♂ (MNRJ) col. Galiano, VIII 71.



Figs. 1-4. *Martella utingae* n. comb. Epigynum : 1. Ventral view; 2. Ventral view, cleared; 3. Dorsal view. 4. Left palp, left side of female abdomen during coupling (RTA disengaged during handling): A. Atrium; CO. Copulatory opening; CP. Copulatory pocket; E. Embolus; GD. Glandular duct; MC. Membranous compartment; PC. Paracymbium; RTA. Retrolateral tibial apophysis; S. Spermatheca; SD. Spermathecal duct. (Scales: 100 µm).

Martella utingae *comb. n. Epigino: 1. Vista ventral; 2. Vista ventral, clarificada; 3. Vista dorsal. 4. Palpo izquierdo, lado izquierdo del abdomen femenino durante la cópula (RTA desenganchada durante la manipulación): A. Atrium; CO. Orificio de copulación; CP. Bolsillo de copulación; E. Émbolo; GD. Conducto glandular; MC. Compartimiento membranoso; PC. Paracymbium; RTA. Apófisis tibial retrolateral; S. Espermateca; SD. Conducto de la espermateca. (Escalas: 100 µm).*

Martella camba (Galiano, 1969) n. comb. (figs. 5-7, 24)

Sarinda camba Galiano 1969: 251, figs. 12-19 (male holotypus N° 6104 MACN from Argentina, Misiones Province, National Park Iguazú: Cataratas, col. Galiano, III 68, examined); Brignoli, 1983: 654; Prószynski, 1990: 314; Höfer & Brescovit, 1994: 104, 107, 108.

Description

Female. Total length 4.27 mm. Carapace length 2.03 mm, width 1.30 mm, height 0.97 mm. Ocular quadrangle length 0.90 mm, first row width 1.28 mm, third row width 1.30 mm. Distances ALE-PME 0.22 mm,

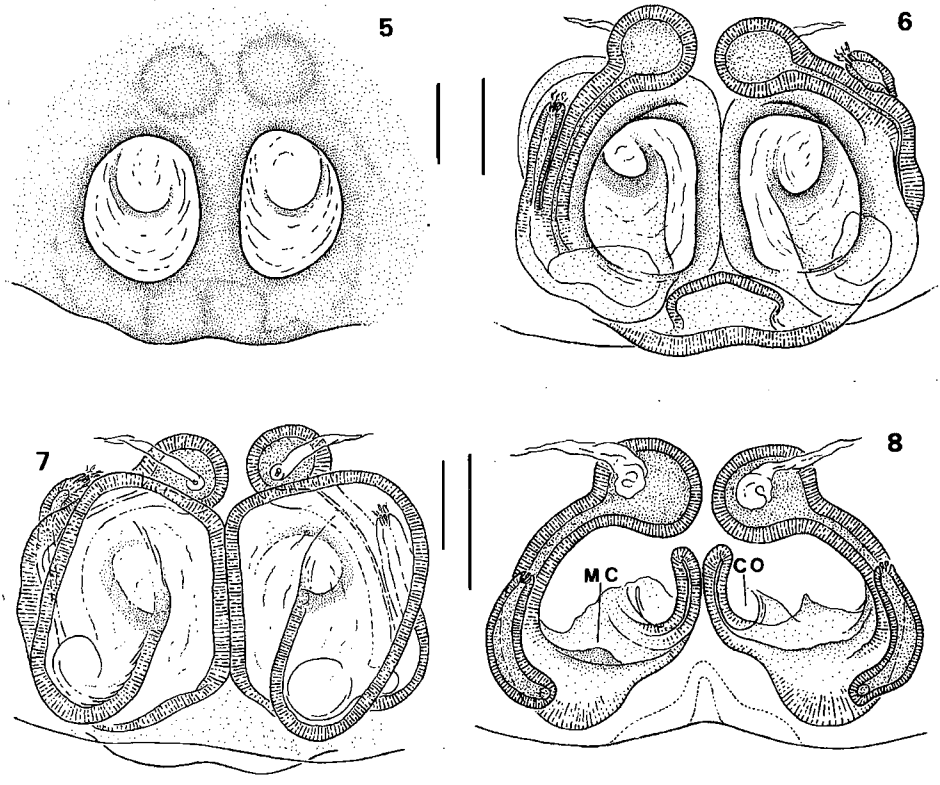
PME-PLE 0.18 mm. AME diameter 0.45 mm. Clypeus height 0.10 mm. Chelicera: promargin with five teeth, retromargin with three or four. Legs IV-I-III-II. Leg spination: Femora and patellae I-IV 0. Tibiae I v 2-2-2-2-2; II v 1r-2-2; III, IV 0. Metatarsi I, II v 2-2; III p 1-1; r 1-1; IV 0. Epigynum (figs. 5-7): copulatory pocket deeper and narrower than in *M. utingae*; two atria with almost circular sclerotized rims, separated by a septum; large copulatory openings connected with the membranous compartment from which the spermathecal and glandular ducts originate.

Note

M. J. Ramírez collected one male and three females in the same area. Matings have not been observed, but it is almost certain that both male and females belong to the same species. The palp of this species has no cymbial apophysis and the tip of the embolus ends in an enlargement covered by denticles (fig. 24).

Material examined

Argentina, Misiones Province, National Park Iguazú, 1 ♀ Nº 9454 MACN, col. Galiano, XI 70; 3 ♀♀ 1 ♂ Nº 9455 MACN, col. M. J. Ramírez, II 95.



Figs. 5-8. Epigynes. 5-7. *Martella camba* n. comb.: 5. Ventral view; 6. Ventral view, cleared; 7. Dorsal view, cleared. *Martella amapa* n. sp.: 8. Dorsal view, cleared: CO. Copulatory opening; MC. Membranous compartment. (Scales: 100 µm).

Epigínos. 5-7. Martella camba *comb. n.: 5. Vista ventral; 6. Vista ventral, clarificada; 7. Vista dorsal, clarificada.* Martella amapa *sp. n.: 8. Vista dorsal, clarificada: CO. Orificio de copulación; MC. Compartimiento membranoso. (Escalas: 100 µm).*

Martella amapa n. sp. (fig. 8)

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

Diagnosis
Martella amapa seems closest to *M. pottsi* Peckham & Peckham, 1892, but differs in the contiguous copulatory openings and the forward directed glandular ducts.

Description
Female holotypus. Total length 5.00 mm. Carapace length 1.93 mm, width 1.25 mm, height 0.93 mm. Ocular quadrangle length 0.87 mm, first row width 1.23 mm, third row width 1.22 mm. Distances ALE-PME 0.23 mm, PME-PLE 0.18 mm. AME diameter 0.45 mm. Clypeus height 0.05 mm. Chelicerae: promargin with four teeth, retromargin with three. Legs IV-I-III-II. Leg spination: Femora and patellae I-IV 0. Tibiae I, right v 2-2-2-2-2, left v 2-2-2-2-1r; II v 2-2-2; III, IV 0. Metatarsi I-III v 2-2; IV v 2ap. Epigynum (fig. 8): copulatory pocket narrow, two shallow atria without rims, copulatory openings contiguous, glandular ducts directed forward.

Material examined
Brazil, *Amapa*: Serra do Navio, ♀ holotypus N° 9456 MACN, col. M. E. Galiano, VI 1966.

Martella gandu n. sp. (figs. 9-14, 23)

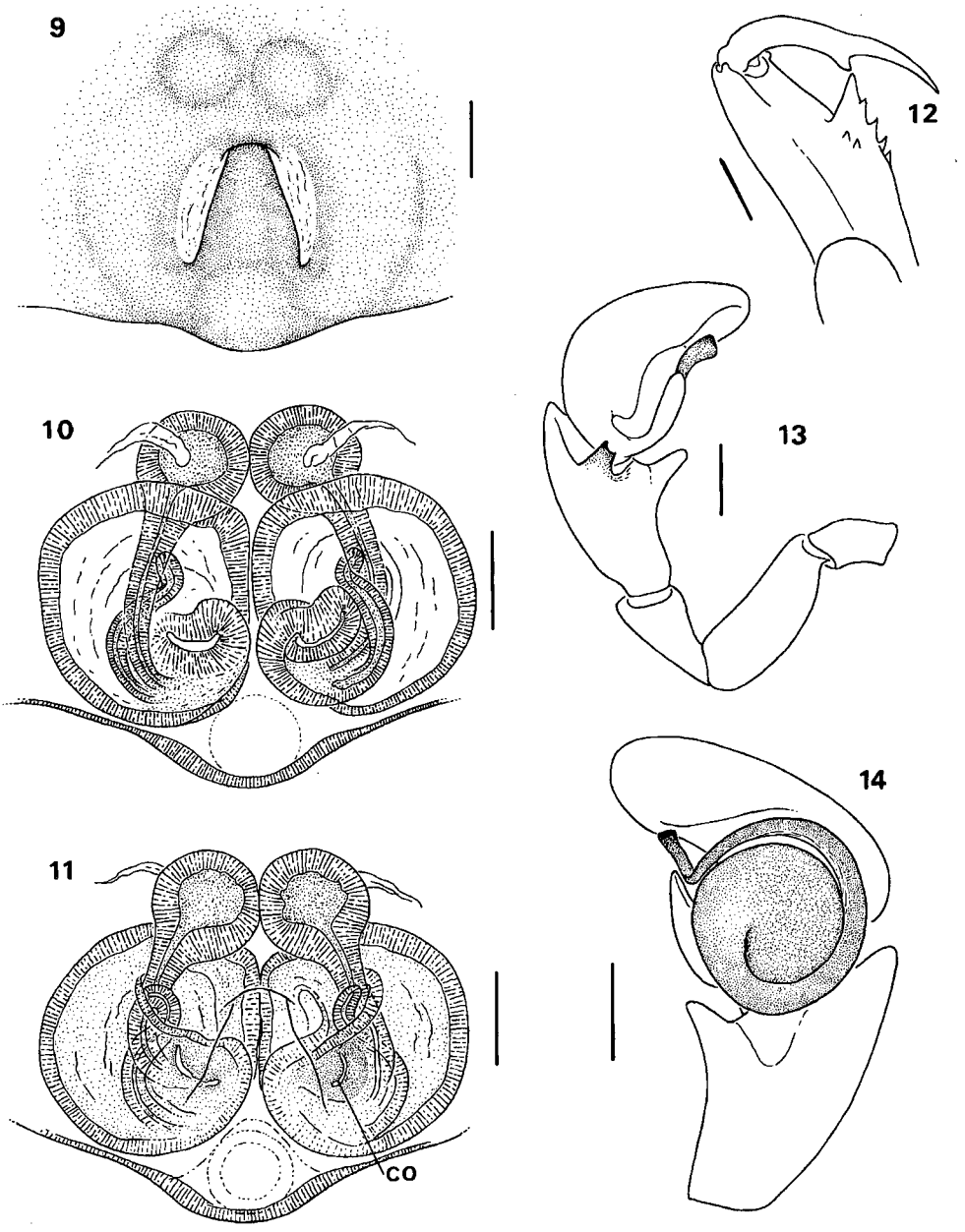
Etymology
The specific name is a noun in apposition taken from the type locality.

Diagnosis
Males of *Martella gandu* can be distinguished from those of *M. pottsi* by the following characters: five pairs of spines on tibia I, cheliceral fangs with median apophysis, bifid retrolateral tibial apophysis, lack of proximal ectal apophysis on cymbium; from males of *M. utingae* are distinguished by the form of the embolus and that of the tibial apophysis. Females of *M. gandu* can be distinguished from those of *M. potssi* by the glandular ducts directed forward and from *M. utingae* by the shape of the membranous compartments of the epigynum.

Description
Female holotypus. Total length 4.27 mm. Carapace length 1.87 mm, width 1.20 mm, height 0.97 mm. Ocular quadrangle length 0.85 mm, first row width 1.17 mm, third row width 1.20 mm. OMP equidistant from ALE and PLE. AME diameter 0.40 mm. Clypeus height 0.05 mm. Chelicerae short, vertical; promargin with five teeth, retromargin with three. Legs IV-I-III-II. Leg spination: Femora and patellae I-IV 0. Tibiae I v 2-2-2-2-2; II v 2-2-2; III-IV 0. Metatarsi I, II v 2-2; III p 1-1, r 1-1; IV p 1-1. Epigynum (figs. 9-11): plate with two oblique atria separated by a median septum that is narrow anteriorly; posterior border projecting backward and covering the copulatory pocket; spermathecae spherical, contiguous.

Male allotypus. Total length 4.00 mm. Carapace length 1.90 mm, width 1.27 mm, height 0.98 mm. Ocular quadrangle length 0.82 mm, first row width 1.13 mm, third row width 1.15 mm. Distances ALE-PME 0.17 mm, PME-PLE 0.20 mm. AME diameter 0.40 mm. Clypeus height 0.06 mm. Chelicerae length 0.87 mm, diverging on apical half; promarginal apophysis with four teeth on internal side; retromargin with two teeth; fangs with apophysis on internal side (fig. 12). Two bands of white hairs on anterior face: one with dense short hairs occupying the length of the internal border and the other on the basal three quarters of the external border, with long but less dense hairs. Legs IV-I-III-II. Leg spination: Femora I p 1ap; II p 1, r 1; III, IV p 1, r 1, d 1 ap. Patellae I-IV 0. Tibiae I v 2-2-2-2-2; II v 2-2-2; III, IV v 2 ap. Metatarsi I, II v 2-2; III p 1-2, r 1-2; IV p 1-1, r 1-1. Palps (figs. 13, 14, 23): length of the articles, femur 0.70 mm, patella 0.45 mm, tibia 0.77 mm, cymbium 0.83 mm. Retrolateral tibial apophysis with bifid tip; ventral tibial apophysis blunt; proximal ectal area of the cymbium smooth. Tip of the embolus enlarged, with a narrow pars pendula. Abdomen with dorsal scutum.

Variants on paratypes: one male has shorter chelicerae (0.68 mm), with three retromarginal teeth. Leg spination of one female: femur II p 1ap; metatarsus II p 1-2.



Figs. 9-14. *Martella gandu* n. sp. Epigynum: 9. Ventral view; 10. Dorsal view, cleared; 11. Ventral view, cleared. Male chelicera: 12. Ventral view. Palp: 13. Retrolateral view; 14. Ventral view. (Scales: 9-12, 100 µm; 13 and 14, 250 µm).

Martella gandu *sp. n. Epigino: 9. Vista ventral; 10. Vista dorsal, clarificada; 11. Vista ventral, clarificada. Quelícero del macho: 12. Vista ventral. Palpo: 13. Vista retrolateral; 14. Vista ventral. (Escalas: 9-12, 100 µm; 13 y 14, 250 µm).*

Material examined
Brazil, Bahia: Gandu, ♀ holotypus, ♂ allotypus and 1 ♀ paratypus (MNRJ) col. CEPEC N° 3201, VII 68; Canavieiras, Camacan, 1 ♀ paratypus N° 9457 MACN, col. Rory-Gonçalvez, 23 VIII 68; Camacan, 1 ♀ paratypus N° 9458 MACN, col. CEPEC; Itamarajú, 2 ♂♂ paratypi N° 9459 MACN, col. Rory-Gonçalvez, 25 VIII 68.

Martella pasteuri n. sp. (figs. 15-21, 25)

Etymology
The specific name is a patronym in honour of the French chemist and bacteriologist Louis Pasteur.

Diagnosis
Martella pasteuri can be distinguished from the other species of the genus by the presence of a proximal ectal corrugated field on the cymbium. The epigynum differs from that of *M. amapa* n. sp. in the copulatory openings placed well apart and from that of *M. potssi* in the glandular ducts directed forward.

Description
Female holotypus.Total length 4.40 mm. Carapace length 1.97 mm, width 1.20 mm, height 0.97 mm. Ocular quadrangle length 0.84 mm, width of first and third rows 1.23 mm. Distances ALE-PME 0.20 mm, PME-PLE 0.18 mm. AME diameter 0.43 mm. Clypeus height 0.04 mm. Chelicerae: promargin with six teeth, left retromargin with four teeth, right with three. Legs IV-I-III-II. Leg spination: Femora I, II, IV 0; III p 1ap. Patellae I-IV 0. Tibiae I v 2-2-2-2-2; II v 2-2-2; III p 1; IV p 1-1. Metatarsi I, II v 2-2; III p 2ap; IV p 1ap. Epigynum (figs. 15-17): copulatory pocket narrow, copulatory openings wide apart, placed in depressions that do not form limited atria, spermathecae spherical, contiguous.

Male allotypus. Total length 4.52 mm. Carapace length 2.10 mm, width 1.45 mm, height 1.13 mm. Ocular quadrangle length 0.95 mm, first row width 1.33 mm, third row width 1.28 mm. Distances ALE-PME 0.25 mm, PME-PLE 0.23 mm. AME diameter 0.47 mm. Clypeus height 0.05 mm. Chelicerae length 0.68 mm, diverging on apical half; fangs and bands of white hairs as in *Martella gandu* n. sp.; promarginal apophysis with five teeth on internal side, retromargin with three teeth (fig. 21). Legs IV-I-III-II. Leg spination: Femora I p 1ap; II p 2ap; III p 2ap, r 1 ap; IV p 2 ap. Patellae I-IV 0. Tibiae I v 2-2-2-2-2; II v 2-2-2; III v 2ap, p 1, r 1; IV v 2ap. Metatarsi I, II v 2-2; III v 2-2, p 1, r 1; IV p 1-2, r 1. Palps (figs. 18-20, 25): length of the articles: femur 0.87 mm, patella 0.55 mm, tibia 1.13 mm, cymbium 0.77 mm. Ventral and retrolateral apophyses small, the last with acute tip; corrugated field on retrolateral basal cymbium (fig. 18, CF); embolus slender, a little enlarged at the tip (fig. 25). Abdomen with a weak dorsal scutum.

Variants on paratypes: one male and one female have four retromarginal teeth.

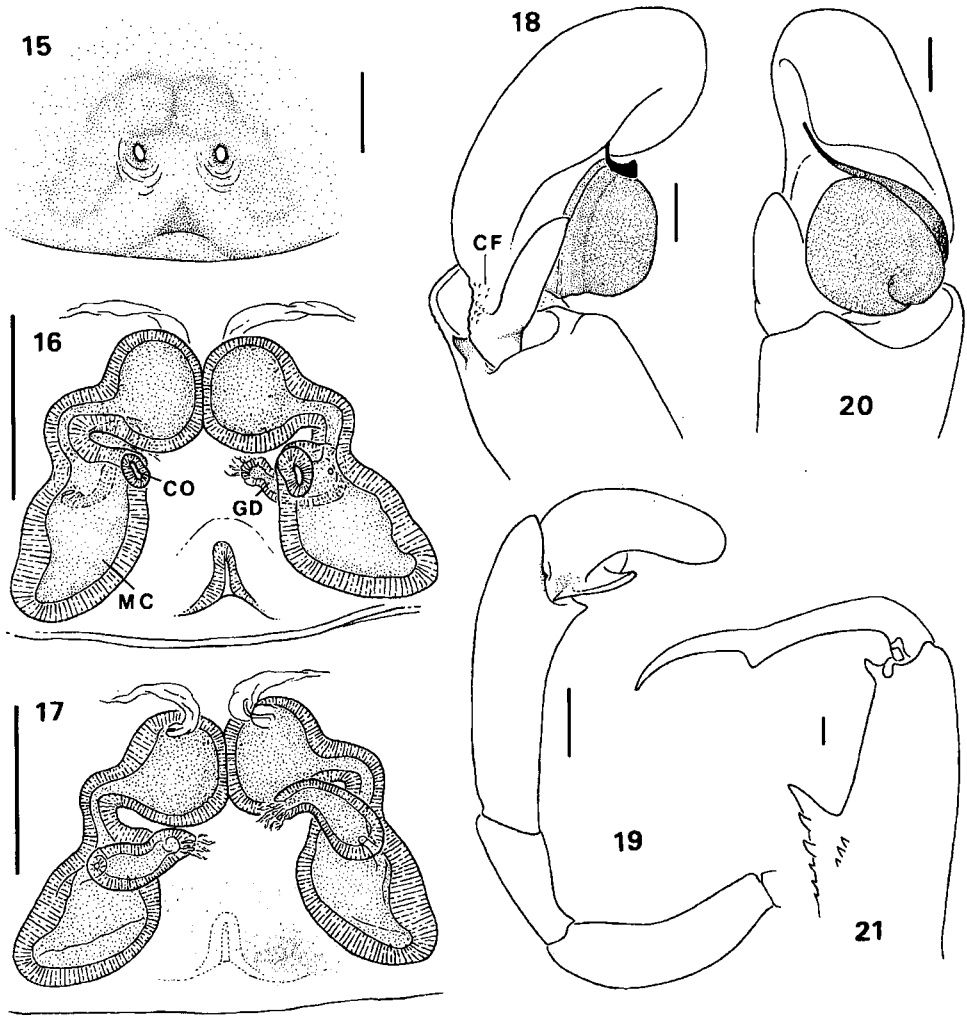
Material examined
Brazil, Amazonas: Reserva Ducke (26 km NE from Manaus), ♀ holotypus, ♂ allotypus and ♀ paratypus (MNRJ), col. Galiano, VIII 71; 2 ♀♀, 4 ♂♂ paratypi N° 9460 MACN, col. Galiano, VII 1971; Pará, Belém: Fazenda Velha, 2 ♀♀ N° 9461 MACN, col. Galiano, VIII 70.

Sarinda chacoensis n. sp. (figs. 26-28)

Etymology
The specific name is an adjective derived from the type locality.

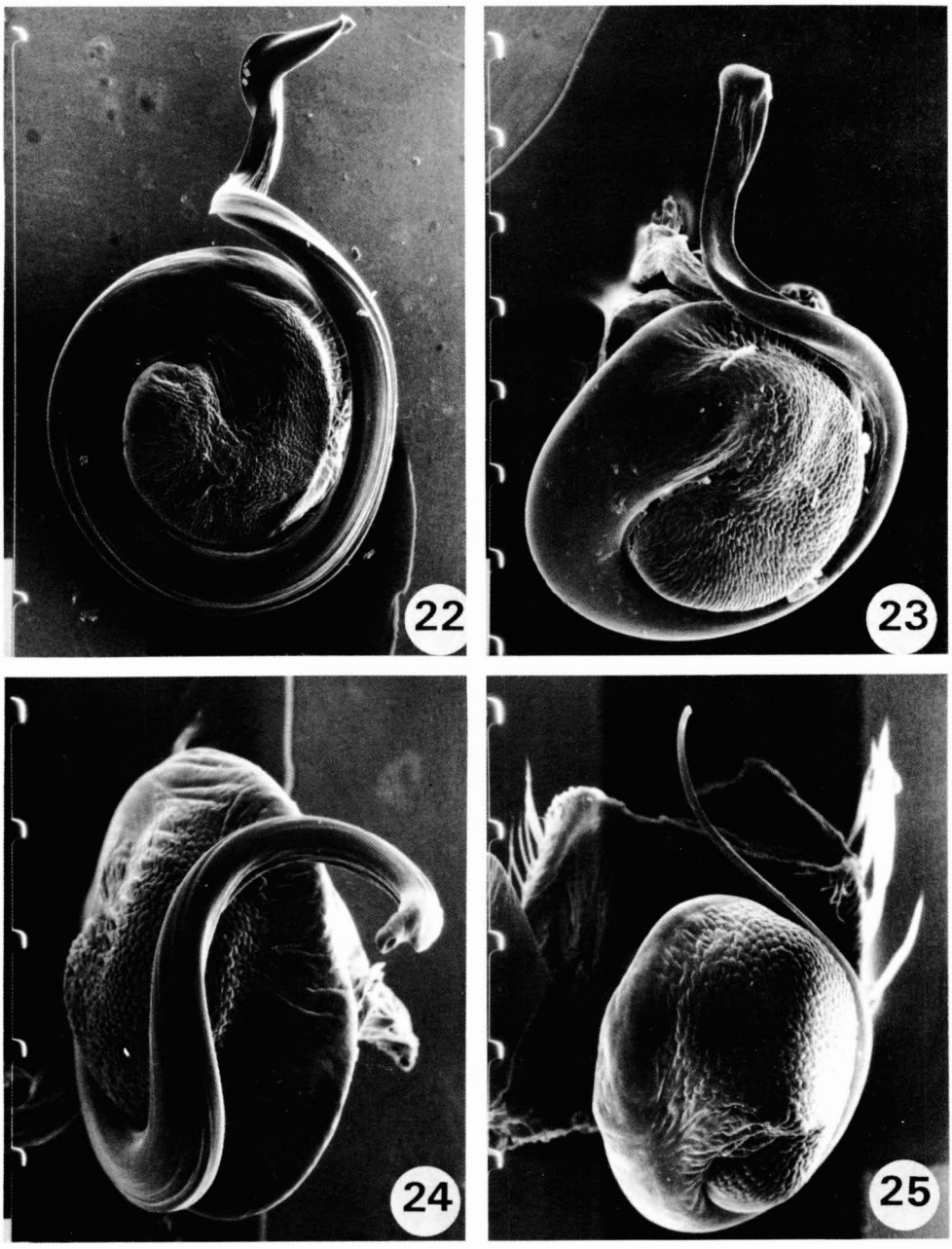
Diagnosis
Sarinda chacoensis differs from all the other species of the genus in the extremely short epigynal ducts.

Description
Female holotypus. Total length 4.52 mm. Carapace length 2.00 mm, width 1.13 mm, height 0.80 mm. Ocular quadrangle length 0.78 mm, first and third rows width 1.12 mm. Distances ALE-PME 0.23 mm, PME-PLE 0.20 mm. AME diameter 0.40 mm. Clypeus height 0.06 mm. Chelicerae: promargin with three teeth; retromargin with four, the apical one bifid. Epigynum (figs. 26-28): copulatory pocket narrow, copulatory openings near middle, copulatory duct almost straight, median duct with two turns, glandular duct



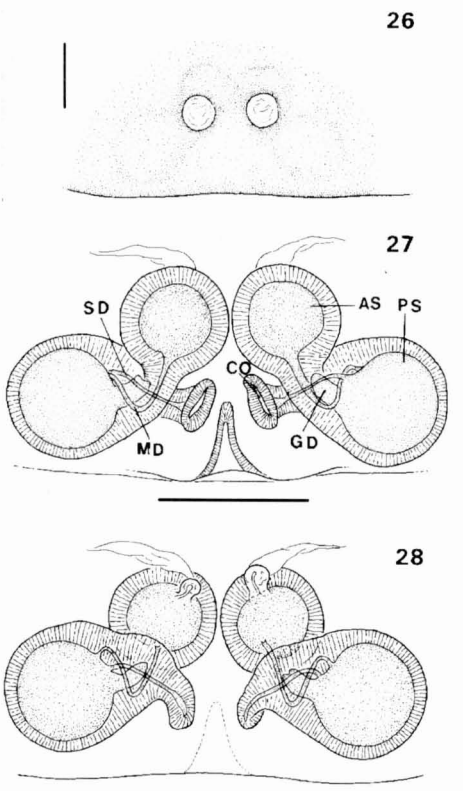
Figs. 15-21. *Martella pasteuri* n. sp. Epigynum: 15. Ventral view; 16. Ventral view, cleared; 17. Dorsal view, cleared. Palp: 18, 19. Retrolateral view; 20. Ventral view. Male chelicera: 21. Ventral view: CF. Corrugated field; CO. Copulatory opening; GD. Glandular duct; MC. Membranous compartment. (Scales: 15-18, 20, 21, 100 µm; 19, 0.5 mm).

Martella pasteuri *sp. n. Epigino: 15. Vista ventral; 16. Vista ventral, clarificada; 17. Vista dorsal, clarificada. 18, 19. Palpo, vista retrolateral; 20. Vista ventral. Quelícero del macho: 21. Vista ventral: CF. Área arrugada; CO. Orificio de copulación; GD. Conducto glandular; MC. Compartimiento membranoso. (Escalas: 15-18, 20, 21, 100 µm; 19, 0,5 mm).*



Figs. 22-25. Bulbs: 22. *Martella utingae* n. comb.; 23. *M. gandu* n. sp.; 24. *M. camba* n. comb.; 25. *M. pasteuri* n. sp. (Scales: 22, 1mm; 23-25, 100μm).

Bulbos: 22. Martella utingae *comb. n.; 23.* M. gandu *sp. n.; 24.* M. camba *sp. n.; 25.* M. pasteuri *sp. n. (Escalas: 22, 1 mm; 23-25, 100 μm).*



Figs. 26-28. *Sarinda chacoensis* n. sp. Epigynum: 26. Ventral view; 27. Ventral view, cleared; 28. Dorsal view, cleared: AS. Anterior spermatheca; CO. Copulatory opening; GD. Glandular duct; MD. Median duct; SD. Spermathecal duct; PS. Posterior spermatheca. (Scales: 100 µm).

Sarinda chacoensis *sp. n. Epigino: 26. Vista ventral; 27. Vista ventral, clarificada; 28. Vista dorsal, clarificada: AS. Espermateca anterior; CO. Orificio de copulación; GD. Conducto glandular; MD. Conducto medio; SD. Conducto de la espermateca; PS. Espermateca posterior. (Escalas: 100 µm).*

short and wide; posterior spermathecae bigger than anterior.

Material examined

Argentina, Chaco Province: Selva del Río de Oro, ♀ holotypus N° 9462 MACN and 1 ♀ paratypus N° 9463 MACN, col. Galiano, I 1965; Misiones Province, National Park Iguazú, 2 ♀♀ paratypi N° 9464 MACN, col. Galiano & Miranda, X 1977; Jujuy Province: Ledesma, 1 ♀ N° 9465 MACN, col. G. Williner, XI 1978.

Discussion

Up to now, the following genitalic characters have been considered diagnostic for *Martella* and *Sarinda*: a. Females of *Sarinda* are defined by two pairs of spermathecae and spiralled median and copulatory ducts; while those of *Martella* have only one pair of spermathecae and no copulatory ducts, because the copulatory entry is connected directly to a membranous compartment from which the spermathecal and glandular ducts originate. b. Males of *Martella* have a proximal ectal apophysis on the cymbium which is absent in *Sarinda*.

According to the length of the embolus, males of *Sarinda* have been arranged (Galiano, 1965) in two groups: 1. Species with a long embolus, describing two or more turns around the tegulum [*S. nigra, S. marcosi, S. silvatica* Chickering, 1946, *S. panamae* Galiano, 1965, *S. capibarae* Galiano, 1967, *S. ruficeps* (Simon, 1901)]; 2. Species with a relatively short embolus, with one turn or less around the tegulum [*S. armata* Peckham & Peckham,1892, *S. hentzi* (Banks, 1903), *S. cutleri* (Richman, 1965), *S. imitans*]. The tegulum and embolus of the species of the second group (one turn or less) are similar to those of the *Martella* species described up to now and the males could be accurately assigned to genus only if the females of the species are known.

The females of *Martella utingae* n. comb., *Martella camba* n. comb. and *Martella gandu* n. sp. present the genitalic structure of *Martella* species while the males have palps similar to the *Sarinda* group 2. *Martella pasteuri* n. sp. has a corrugated field (fig. 18) at the place of the ectal cymbial apophysis which is interpreted as a substitute for the apophysis. It appears that *Martella* is comprised of species both with and without cymbial apophysis and there

could be intermediate forms.

On the basis of the data given in this paper, it is evident that the principal diagnostic structures separating *Martella* from *Sarinda* are those of the internal female genitalia.

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Resumen

Salticidae (Araneae) formiciformes. Dos nuevas combinaciones y cuatro nuevas especies de los géneros Martella *y* Sarinda

Los ejemplares femeninos de *Sarinda utingae* Galiano, 1967 (figs. 1-4, 22) y *Sarinda camba* Galiano, 1969 (figs. 5-7, 24) se describen por primera vez y ambas especies se transfieren a *Martella* como nuevas combinaciones. Se describen cuatro especies: *Martella amapa* n. sp. (fig 8), *Martella gandu* n. sp. (figs. 9-14, 23) y *Martella pasteuri* n. sp. (figs. 15-21, 25) de Brasil, y *Sarinda chacoensis* n. sp. (figs. 26-28), de Argentina. Los caracteres diagnósticos de ambos géneros se discuten; se considera que el principal carácter diagnóstico que separa *Martella* de *Sarinda* reside en la estructura interna de los genitales femeninos.

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