

Two new species of ant-mimicking spiders of the genus *Ianduba* Bonaldo (Araneae, Corinnidae) from Southern Bahia, Brazil

Alexandre B. Bonaldo ¹; Antonio D. Brescovit ²; Pedro L. B. da Rocha ³ & Misonete G. C. Costa ³

¹ Departamento de Zoologia, Museu Paraense Emílio Goeldi. Avenida Magalhães Barata 376, Caixa Postal 399, 66040-170 Belém, Pará, Brasil. E-mail: bonaldo@museu-goeldi.br

² Laboratório de Artrópodes, Instituto Butantan. Avenida Vital Brasil 1500, 05503-900 São Paulo, São Paulo, Brasil. E-mail: adbresco@terra.com.br

³ Instituto de Biologia, Universidade Federal da Bahia. Rua Barão de Geremoabo, 40170-290 Salvador, Bahia, Brasil. E-mail: peurocha@ufba.br

ABSTRACT. Two new species of the ant mimicking spider genus *Ianduba* Bonaldo (Araneae, Corinnidae), *I. mugunza* **sp. nov.** and *I. abara* **sp. nov.**, are described based on males and females from Porto Seguro, in the state of Bahia, Brazil. All specimens were collected in pitfall traps, installed in two forested areas: Estação Ecológica de Vera Cruz, a well preserved Atlantic forest fragment, and a contiguous field of *Eucalyptus* monoculture. **KEY WORDS.** Arachnida; Dionycha; Neotropical Region; taxonomy.

RESUMO. Duas espécies novas de aranhas mirmecófilas do gênero *Ianduba* Bonaldo (Araneae, Corinnidae) do sul da Bahia, Brasil. Duas espécies novas de aranhas mirmecófilas do gênero *Ianduba* Bonaldo (Araneae, Corinnidae), *Ianduba mugunza* **sp. nov.** e *I. abara* **sp. nov.**, são descritas com base em machos e fêmeas coletados em Porto Seguro, no estado da Bahia, Brasil. Todos os espécimes foram coletados com armadilhas de queda, em duas áreas florestadas: na Estação Ecológica de Vera Cruz, um fragmento bem preservado de Mata Atlântica, e em um campo de monocultura de *Eucalyptus*, contíguo à Estação. **PALAVRAS-CHAVE.** Arachnida; Dionycha; região Neotropical; taxonomia.

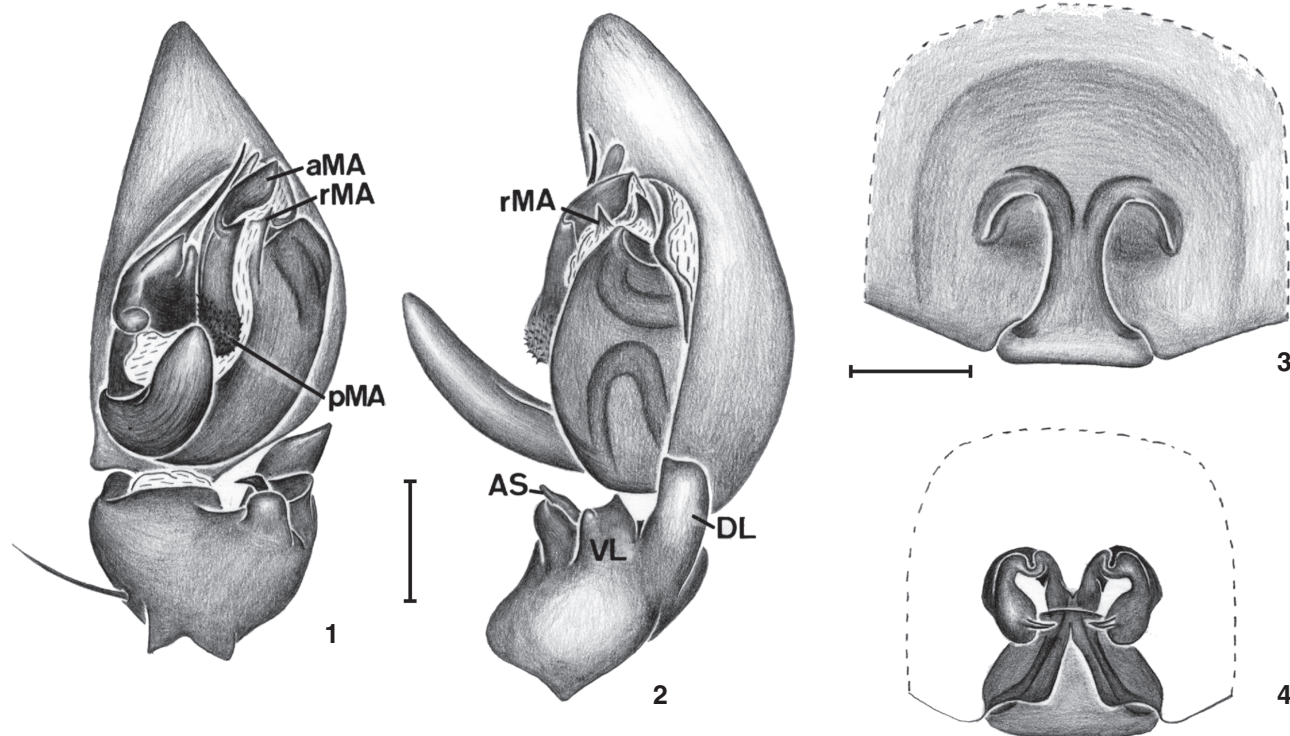
The genus *Ianduba* was proposed by BONALDO (1997) to include some odd ant mimicking corinnid species, all of which superficially resembling castianeirines. At the time of the genus proposal only one of the five currently recognized species was known, *Ianduba varia* (Keyserling, 1891), originally described in *Castianeira*. It is a well known synanthropic species, occurring frequently in houses in southern and southeastern Brazil. All other *Ianduba* species occur in cocoa plantations (*Theobroma cacao* L.) in southern state of Bahia. These perennial crops, shaded by remnant native trees, might be able to maintain part of the original Atlantic forest biological diversity (MIRANDA 1938, LEITE 1987). However, recent evidence suggests they should not be seen as surrogate for mature forest, as they allow occupancy by non-forest species which can, therefore, invade forest remnants (PARDINI 2004). The four *Ianduba* species so far known from southern Bahia are listed as vulnerable in the official list of Brazilian endangered species (MACHADO & BRESCOVIT 2005). The southern Bahia Atlantic Forest remnants present high degrees of endemism, not only for spider species (SIMÓ & BRESCOVIT 2001), but also for plants (MORI *et al.* 1981, PRANCE 1982), insects (BROWN 1991) and vertebrates, such as reptiles (JACKSON 1978, ARGÓLO 2004), birds (HAFFER 1974) and mammals (RYLANDS 1989, 1996).

The hitherto known species of *Ianduba* were reported to occur in a range of altered habitats, from human habitations to managed forests. In the present paper we describe two additional species of the genus, the first known to occur in well preserved forest although they occurred in an *Eucalyptus* plantation as well.

MATERIAL AND METHODS

The material was collected within a sampling design planned to compare the composition of ground-dwelling arthropod fauna from two forested habitats in Porto Seguro, state of Bahia (M.C.G. Costa, unpublished data). A 6.069 ha Atlantic Forest private reserve, Estação Ecológica de Vera Cruz, one of the last major forest islands in the region, preserving plain, almost intact, compact ombrophilous forest (FRANCO *et al.* 1998), and a seven year old *Eucalyptus* monoculture adjacent to it. Four pitfall trap arrays, each one containing nine 20 liter empty buckets linked by drift fences, were randomly distributed in each habitat. Arthropods were collected from these traps during three days in October, 2001 (rainy season) and three days in March, 2002 (dry season).

The specimens examined were deposited in the following institutions (abbreviation and curator in parenthesis):



Figs 1-4. *Ianduba mugunza* sp. nov.: (1) male palp, ventral view; (2) same, retrolateral view; (3) female epigynum, ventral view; (4) female vulva, dorsal view. (aMA) Apical sector of median apophysis, (AS) apical spur of ventral lobe of retrolateral tibial apophysis, (DL) dorsal lobe of tibial retrolateral apophysis, (pMA) prolateral sector of median apophysis, (rMA) retrolateral sector of median apophysis, (VL) ventral lobe of tibial retrolateral apophysis. Scale bars: 0.25 mm.

Instituto Butantan, São Paulo (IBSP, A.D. Brescovit); Museu Paraense Emílio Goeldi, Belém (MPEG, A.B. Bonaldo); Instituto de Zoologia, Universidade Federal da Bahia, Salvador (UFBA, T.K. Brazil). Descriptions and terminology, including abbreviations, follow BONALDO (1997). All measurements are in millimeters. The female epigynum was dissected and immersed in clove oil to study internal structures. Micrographs were obtained with a Zeiss LEO (1450 VP) scanning electron microscope from the Laboratório Institucional de Microscopia Eletrônica de Varredura do MPEG.

Ianduba mugunza Bonaldo & Brescovit sp. nov.

Figs 1-25

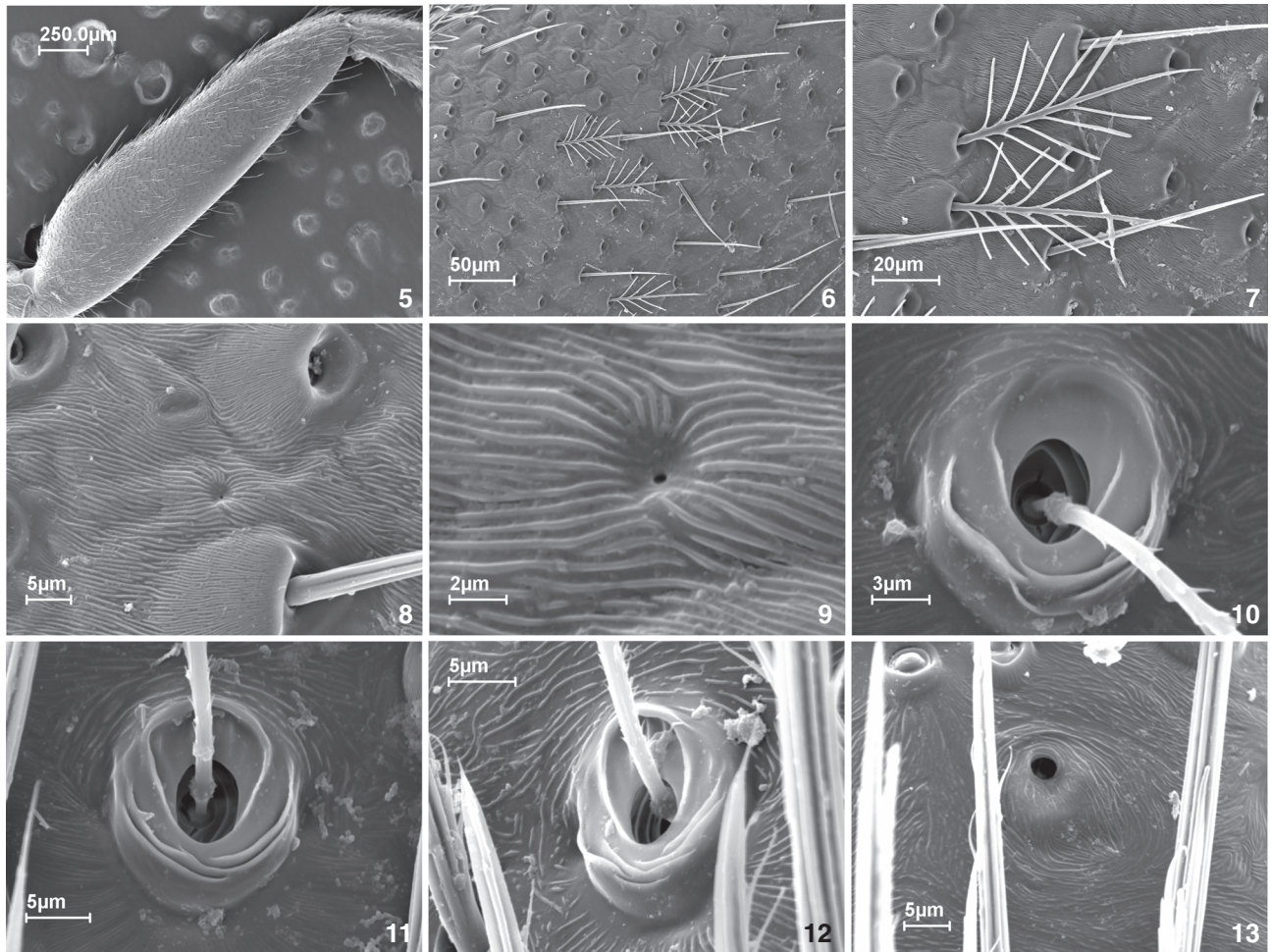
Types. Male holotype from Estação Ecológica de Vera Cruz (16°23'31"S, 39°10'19"W), Porto Seguro, Bahia, Brazil, 06.III.2002, M.G.C. Costa *leg.*, deposited in UFBA 2268; paratypes: female from *Eucalyptus* monoculture, Porto Seguro, Bahia, Brazil, 06.III.2002, M.G.C. Costa *leg.*, deposited in UFBA 2223; one male, with same data, 28.X.2001, in IBSP 63592 and one male, with same data, 28.X.2001, in MPEG 2941.

Etymology. The specific name is a nouns taken from Brazilian Portuguese language that refers to a typical dessert from

Bahia cuisine which is prepared with white hominy, whole milk, sweetened condensed milk, coconut milk, unsalted peanuts, roasted and ground cinnamon.

Diagnosis. Males of *Ianduba mugunza* sp. nov. can be recognized by the ventral lobe of retrolateral tibial apophysis with large, sub-quadrangular apical process (Figs 2 and 14) and the conical, entire tegular projection, inserted basally on prolateral side of tegulum (Figs 1-2, 15 and 22); females differ from those of all known *Ianduba* species by the wide based, medially constricted median plate (Fig. 3).

Description. Male (holotype). Carapace dark brown, chelicerae, endites and labium brown, sternum reddish brown, legs brown, except metatarsus I darker, abdomen dark brown, scutum reddish brown, dorsum with four posterior transverse white stripes, venter white brown with four long narrow pale stripes. Total length 6.30. Carapace 3.00 long, 1.90 wide, 0.80 high. Clypeus 2.22 high. Anterior eye row 0.64 long, posterior eye row 0.72 long. Eye diameters and interdistances: AME 0.16, ALE 0.14, PME 0.14, PLE 0.14; AME-AME 0.06, AME-ALE 0.06, PME-PME 0.10, PME-PLE 0.12, ALE-PLE 0.04. MOQ length 0.36, anterior width 0.38, posterior width 0.34. Chelicerae 1.10 long, with three promarginal and four retromarginal teeth; venter-

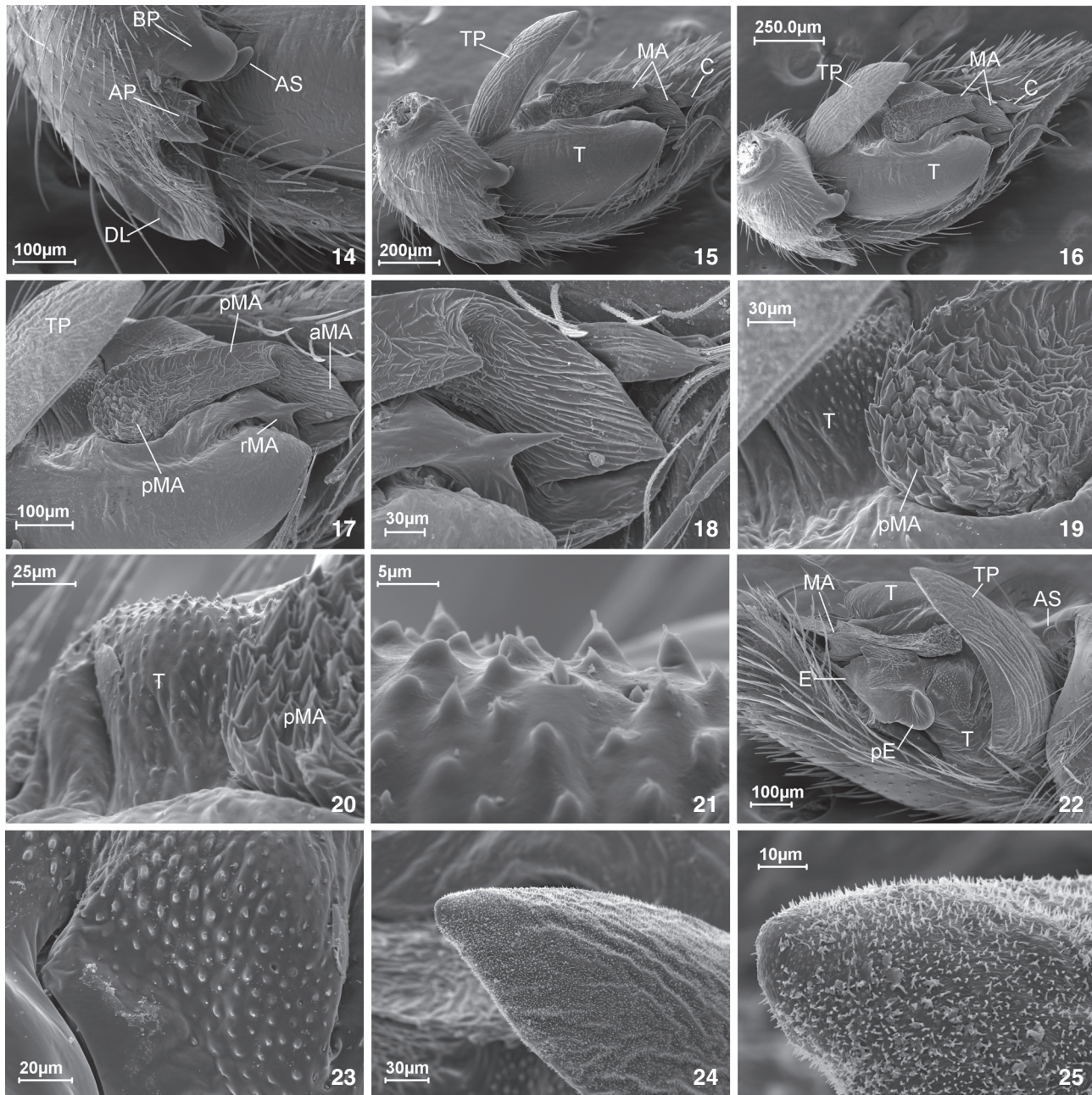


Figs 5-13. *landuba mugunza* sp. nov.: male: (5) femur I, prolateral view; (6-7) same, feathery and simple hairs; (8-9) same, tegument pores; (10-11) metatarsus I, trichobothrial base; (12) tarsus I, trichobothrial base; (13) same, tarsal organ.

retrolateral surface with short distal tooth-like apophysis. Sternum 1.50 long, 1.20 wide. Abdomen 3.20 long, 1.40 wide. Leg measurements: I - femur 2.10/patella 1.00/tibia 1.90/metatarsus 1.80/tarsus 1.30/total 8.10. II - 1.90/0.90/1.50/1.60/1.10/7.00. III - 1.50/0.80/1.30/1.60/0.90/6.10. IV - 2.30/1.10/2.10/2.70/1.20/9.40. Leg spination. II - tibia v2-2-2, III - tibia 1p-2-2. Palp: ventral lobe of tibial retrolateral apophysis with conspicuous basal process (Fig. 2), large apical spur and truncated apical process; dorsal lobe long, well developed, sub-rectangular (Figs 14-15); tegular projection with basal, prolateral insertion, without excavations, ventral surface covered by small papillae (Figs 15, 22, 24 and 25); tegular surface with a field of small sharp points (some collapsed) located near base of embolus (Figs 19-21 and 23); pMA with field of sharp points; rMA with pointed tip; aMA with ridged surface and folded, sharp apex (16-18); conductor long, escorting embolus apices (17-18); embolus gently curved, inserted prolaterally, with large

base and pointed proximal process (Figs 1-2 and 22).

Female (UFBA 2223, paratype). Coloration as in male. Total length 7.30. Carapace 3.60 long, 2.50 wide, 1.00 high. Clypeus 0.26 high. Anterior eye row 0.84 long, posterior eye row 0.88 long. Eye diameters and interdistances: AME 0.18, ALE 0.16, PME 0.14, PLE 0.14; AME-AME 0.06, AME-ALE 0.04, PME-PME 0.12, PME-PLE 0.14, ALE-PLE 0.06. MOQ length 0.44, anterior width 0.42, posterior width 0.44. Chelicerae 1.20 long, teeth as in male. Sternum 1.80 long, 1.40 wide. Abdomen 3.20 long, 1.60 wide. Leg measurements: I - femur 2.50/patella 1.20/tibia 2.20/metatarsus 1.90/tarsus 1.40/total 9.20. II - 2.30/1.10/2.00/1.90/1.30/8.60. III - 2.20/1.00/1.60/2.20/1.10/8.10. IV - 2.80/1.30/2.50/3.30/1.40/11.30. Leg spination. II - tibia v1r-1r, III tibia v2-2-2. Epigynum: median plate convex with wide base and well defined lateral borders and anterior borders directed laterally; copulatory openings visible by transparency under the borders of ventral plate; vulva with bipartite, inverted



Figs 14-25. *landuba mugunza* sp. nov., male left palp: (14-15), ventro-retrolateral view; (16-19), ventral view; (20-21) retrolateral view; (22-25) ventro-prolateral view; (14) retrolateral tibial apophysis; (15-16; 22) palpal tibia and cymbium; (17-18) apex of palpal bulb; (19-20) base of median apophysis; (21; 23) tegular surface; (24-25), apex of tegular projection. (aMA) Apical sector of median apophysis, (AP) apical process of ventral lobe of retrolateral tibial apophysis, (AS) apical spur of ventral lobe of retrolateral tibial apophysis, (BP) basal process of ventral lobe of retrolateral tibial apophysis, (C) conductor, (DL) dorsal lobe of tibial retrolateral apophysis, (E) embolus, (MA) median apophysis, (pE) proximal process of embolus, (pMA) prolateral sector of median apophysis, (rMA) retrolateral sector of median apophysis, (T) tegulum, (TP) tegular projection.

V-shaped dorsal piece; copulatory ducts folded posteriorly; spermathecae oval, longitudinally disposed (Figs 3-4).

Variation. Five males: total length 6.30-7.40; carapace 3.00-3.40; femora I 2.10-2.40.

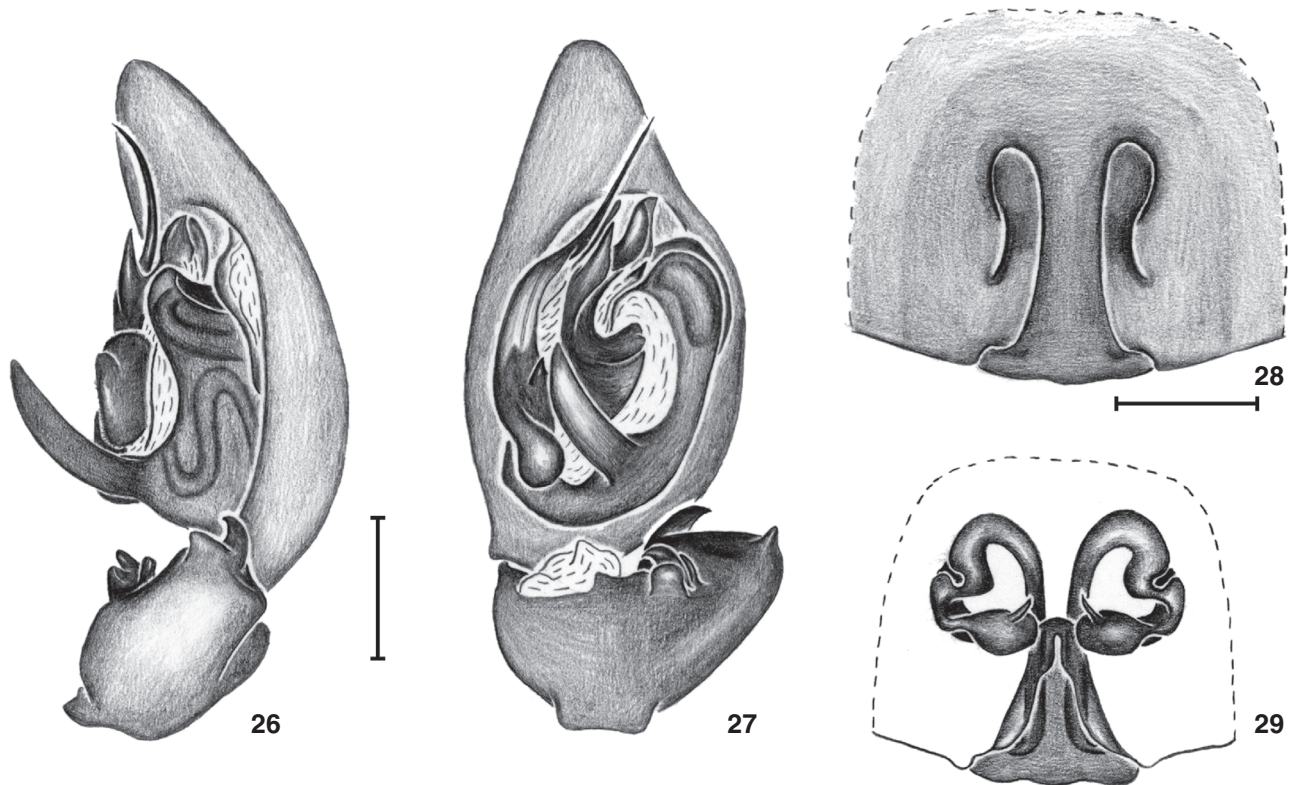


Fig. 26-29. *Ianduba abara* sp. nov.: (26) male palp, ventral view; (27) same, retrolateral view; (28) female epigynum, ventral view; (29) female vulva, dorsal view. Scale bars: 0.25 mm.

Distribution. Known only from the type locality.

Other material examined. BRAZIL, Bahia: Porto Seguro (Estação Ecológica de Vera Cruz, 16°23'31"N, 39°10'19"W), 1 male, 30.X.2001, M.G.C. Costa leg. (IBSP 63593); (*Eucalyptus* monoculture) 1 male, 28.X.2001, M.G.C. Costa leg. (UFBA 2314);

Ianduba abara Bonaldo & Brescovit sp. nov.

Figs 26-38

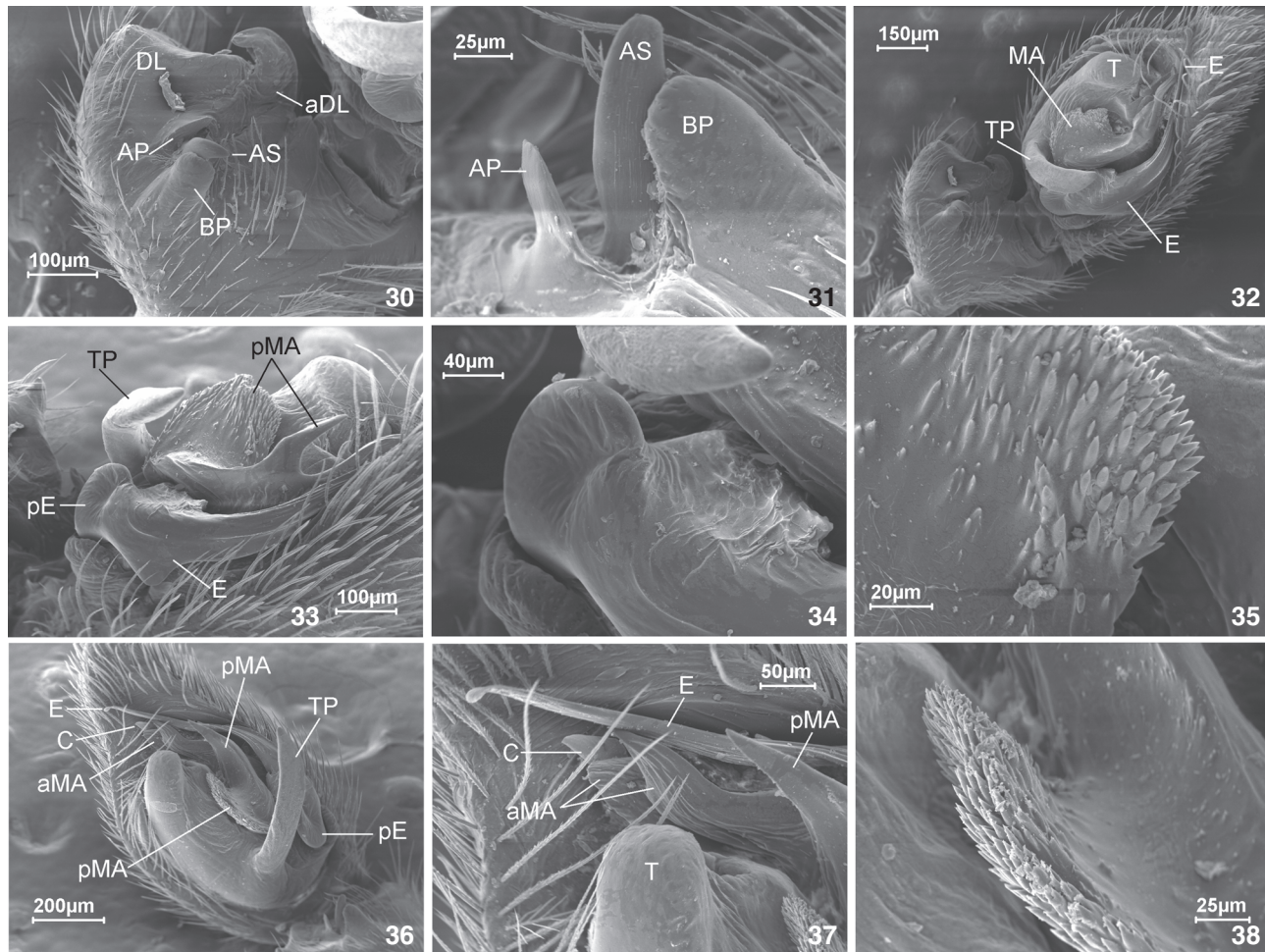
Types. Male holotype and female paratype from *Eucalyptus* monoculture, Porto Seguro, Bahia, Brazil, 23.X.2001, M.G.C. Costa leg., deposited in UFBA 2276; paratypes with same data as holotype: one female, 06.III.2002, in UFBA 2310; one male and one female, 6.III.2002, in IBSP 63594, and one male, 6.III.2002, in MPEG 2942.

Etymology. The specific name is a nouns taken from the Brazilian Portuguese, that refers to a typical dish from Bahia cuisine which is prepared from a batter made from white beans, cooked in dende oil, served split in the middle and filled with vatapá, hot chili paste and dried shrimp on a banana leaf.

Diagnosis. Males of *Ianduba abara* sp. nov. differ from all known males in the genus by the hook-shaped apex of dorsal lobe of tibial retrolateral apophysis, combined with the relatively short conic tegular projection (Figs 26-27, 32 and 36);

females differ from those of *I. paubrasil* Bonaldo (see BONALDO 1997, fig. 27) by the long, posteriorly directed lateral borders of the epigynal median plate (Fig. 28).

Description. Male (holotype). Coloration as in *I. mugunza*, except palp brown, abdomen violet and yellowish brown spinnerets. Total length 4.90. Carapace 2.40 long, 1.50 wide, 0.80 high. Clypeus 0.16 high. Anterior eye row 0.60 long, posterior eye row 0.66 long. Eye diameters and interdistances: AME 0.14, ALE 0.12, PME 0.12, PLE 0.12; AME-AME 0.06, AME-ALE 0.04, PME-PME 0.10, PME-PLE 0.12, ALE-PLE 0.06. MOQ length 0.48, anterior width 0.50, posterior width 0.52. Chelicerae 0.80 long, with three promarginal and three retromarginal teeth; venter-retrolateral surface with short distal tooth-like apophysis. Sternum 1.20 long, 1.00 wide. Abdomen 2.30 long, 1.10 wide. Leg measurements: I - femur 1.50/patella 0.70/tibia 1.30/metatarsus 1.30/tarsus 1.00/total 5.80. II - 1.40/0.70/1.10/1.10/0.90/5.20. III - 1.20/0.60/1.00/1.20/0.70/4.70. IV - 1.70/0.80/1.50/1.90/0.80/6.70. Leg spination. II tibia v2-2-2, III tibia p0-1-0, v1p-2-2, IV tibia v1p-2-2. Palp: ventral lobe of tibial retrolateral apophysis with conspicuous basal process, short, stout apical spur and small apical process; very large dorsal lobe, with small pointed apophysis and hook-shaped, large apex (Figs 26-27 and 30-31); tegular projection with retrolateral insertion, without excava-



Figs 30-38. *landuba abara* sp. nov., male right palp: (30) retrolateral tibial apophysis, ventral; (31) ventral lobe of tibial retrolateral apophysis, posterior; (32) palpal tibia and cymbium, ventral; (33) bulb, prolateral; (34) base of embolus, same view; (35) prolateral sector of median apophysis, same view; (36-37), bulb, ventro-retrolateral; (38) prolateral sector of median apophysis, same view. (aMA) apical sector of median apophysis, (aDL) apices of dorsal lobe of retrolateral tibial apophysis, (AP) apical process of ventral lobe of retrolateral tibial apophysis, (AS) apical spur of ventral lobe of retrolateral tibial apophysis, (BP) basal process of ventral lobe of retrolateral tibial apophysis, (C) conductor, (DL) dorsal lobe of tibial retrolateral apophysis, (E) embolus, (MA) median apophysis, (pE) proximal process of embolus, (pMA) prolateral sector of median apophysis, (T) tegulum, (TP) tegular projection.

tions (Figs 32-33 and 36); pMA smooth, retrolateral border covered by dense cluster of sharp points, apical border pointed; rMA small, pointed and sclerotized; aMA with bifid apex (Figs 32-33 and 35-38); conductor narrow, not escorting embolus apices (Fig. 37); embolus long, with expanded apices, inserted prolaterally, with slender distal third, base large, basal proximal process a large, rounded projection (Figs 33-34 and 36).

Female (IBSP 63594, paratype). Coloration as in male. Total length 5.50. Carapace 2.70 long, 1.80 wide, 0.90 high. Clypeus 0.20 high. Anterior eye row 0.64 long, posterior eye row 0.74 long. Eye diameters and interdistances: AME 0.16, ALE 0.14, PME 0.14, PLE 0.14; AME-AME 0.06, AME-ALE 0.04,

PME-PME 0.08, PME-PL 0.12, ALE-PL 0.04. MOQ length 0.34, anterior width 0.36, posterior width 0.34. Chelicerae 1.00 long, with three promarginal and four retromarginal teeth. Sternum 1.30 long, 1.10 wide. Abdomen 2.80 long, 1.70 wide. Leg measurements: I - femur 1.80/patella 0.80/tibia 1.50/metatarsus 1.30/tarsus 0.90/total 6.30. II - 1.60/0.70/1.30/1.20/0.90/5.70. III - 1.40/0.70/1.10/1.40/0.70/5.30. IV - 2.00/0.70/1.80/2.20/0.90/7.60. Leg spination. II - tibia p0-1-0, v1r-1r-1r, III tibia v1p-2-2. Epigynum: median plate convex with wide base, well defined lateral borders and anterior borders directed posteriorly; copulatory openings visible by transparency under the borders of ventral plate; vulva with bipartite, inverted V-shaped

dorsal piece; copulatory ducts long, folded posteriorly; spermathecae oval, transversally disposed (Figs 28 and 29).

Variation. Seven males: total length 4.80-5.40; carapace 2.30-2.60; femora I 1.50-1.70. Two females: total length 5.40-5.50; carapace 2.60-2.70; femora I 1.70-1.80.

Distribution. Known only from the type locality.

Other material examined. BRAZIL. *Bahia*: Porto Seguro (Estação Ecológica de Vera Cruz, 16°23'31"S, 39°10'19"W), 2 males, 6.III.2002 (UFBA 2270; 2273) all collected by M.G.C. Costa; (*Eucalyptus* monoculture) 1 male, 23.X.2001 (IBSP 63595); 1 male, 8.III.2002 (IBSP 63596).

DISCUSSION

The two species herein described present the characteristic tegular projection occurring in all *Ianduba* except *I. varia*. This projection is generally conical and large, as in the species presented above, but it is represented by a short laminar lobe in the type species, *I. vatapa* Bonaldo, 1997. Interestingly, electron scanning micrographs of the male palp of both herein described species showed that they present some of the sectors of the median apophysis covered by fields of small sharp sclerotized points (Figs 19 and 35). *Ianduba mugunza* sp. nov. presents such feature even on the tegular surface (Figs 20 and 21). Similar fields were observed before only in the clavate apical sector of the median apophysis of *I. varia* (see BONALDO 1997, figs 7-10 and 13), a deviating species which presents an extremely modified bulb, with partially unsclerotized median apophysis and retrolaterally inserted embolus.

Six out of eight individuals of *I. abara* sp. nov. and two out of seven individuals of *I. mugunza* sp. nov. were collected in the preserved forest. The low capture rates for both species demand caution in the interpretation of their association with preferential habitats. However, it is possible that at least some *Ianduba* species present abundance patterns similar to those observed in many species of Lycosidae (MORING & STEWART 1994, JOCQUÉ & ALDERWEIRELDT 2005) and Linyphiidae (CANDIANI *et al.* 2005), occurring in low abundances in well preserved forests and being benefited by habitat simplification. Further sampling efforts in well preserved southern Bahia Atlantic Forest remnants, as well as in managed forests (both cocoa and *Eucalyptus*), might indicate that these spiders have wide ecological valence, which would justify the exclusion of four *Ianduba* species from the Brazilian endangered species list.

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