

## A revision of *Neodiplothele* (Araneae: Mygalomorphae: Barychelidae)

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**ABSTRACT.** The Neotropical Sasoninae *Neodiplothele* Mello-Leitão, 1917 is revised and now includes eight species. *Neodiplothele* can be distinguished from other Sasoninae by the absence of the posterior median spinnerets and differs Neotropical relatives as *Cosmopelma* by the absence of cuspules on coxae of leg I and *Paracenobiopelma* by the absence of cuspules on the labium. The male of *N. irregularis* Mello-Leitão, 1917 and *N. picta* Vellard, 1924 are described and illustrated for the first time. *Neodiplothele leonardosi* Mello-Leitão, 1939 is considered a junior synonym of *N. irregularis*. Five new species are described from Brazil: *N. aureus* sp. nov. from the states of Ceará, Rio Grande do Norte, Paraíba, and Minas Gerais, *N. itabaiana* sp. nov. from Sergipe, *N. martinsi* sp. nov. from Bahia, Espírito Santo, and Minas Gerais, *N. indicattii* sp. nov. from Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo, *N. caucaia* sp. nov. from Ceará, Goiás, and Mato Grosso do Sul. Two informal groups are proposed based on genitalia morphology: *irregularis* group and *picta* group. An identification key and new distribution records for all known species are given.

**KEY WORDS.** Natural history; Neotropical region; Sasoninae; taxonomy; trapdoor spider.

Barychelidae Simon, 1889 is subdivided in two subfamilies: Barychelinae and Sasoninae (RAVEN 1985) which includes 42 genera and 291 species (WORLD SPIDER CATALOG 2015). Sasoninae currently includes the genera: *Sason* Simon, 1887, *Cosmopelma* Simon, 1889, *Neodiplothele* Mello-Leitão, 1917 and *Paracenobiopelma* Feio, 1952, from these genera, only *Sason* is not present in the Neotropical region (RAVEN 1985, GOLOBOFF 1995). Sasoninae differs from Barychelinae by the presence of a narrow clypeus, short and conical apical segment of the posterior lateral spinnerets, labium and eye tubercle wider than long (RAVEN 1985, 1986).

*Neodiplothele* was established by MELLO-LEITÃO (1917) based on *N. irregularis*, a female from Campina Grande, Paraíba, Brazil. Later, another three species from Brazil were described: *N. fluminensis* Mello-Leitão, 1924 based on a male from Floresta da Tijuca, *N. picta* Vellard, 1924 based on a female from Niterói, both from state of Rio de Janeiro and *N. leonardosi* Mello-Leitão, 1939 based on a female from Cabeceira do Paraguaçu, state of Bahia.

BÜCHERL et al. (1971) redescribed *N. fluminensis*, presented an illustration of the male palpal bulb for the first time and observed that *N. leonardosi* was a juvenile specimen. RAVEN (1985) transferred *Neodiplothele* to Pycnothelinae (Nemesiidae) due to the presence of numerous keels on the bulb, small intercheliceral tumescence, absence of third tarsal claw and pseudosegmented tarsi of males. This transfer was rejected by GOLOBOFF (1995) who classified the genus back in Barychelidae, due to the well-developed claw tufts and tarsal claws without teeth, and included the genus in Sasoninae for sharing with *Cosmopelma* and *Paracenobiopelma* the presence of an intercheliceral tumescence

and the bulb with low ridges. Examination of the type-material and a large number of specimens from several Brazilian collections have offered us the opportunity to revise the genus, describe the male of *N. irregularis* and *N. picta* for the first time, and also describe five new species, all from Brazil. Two informal groups of species are proposed based in genitals characters: *irregularis* group and *picta* group.

### MATERIAL AND METHODS

The material examined is deposited in the following collections: Instituto Butantan, São Paulo (IBSP, A.D. Brescovit); Museu Nacional, Rio de Janeiro (MNRJ, A.B. Kury); Museu de Zoologia, Universidade de São Paulo, São Paulo (MZSP, R. Pinto da Rocha); Universidade Federal de Minas Gerais, Belo Horizonte (UFMG, A.J. Santos) and Universidade Federal do Piauí, Floriano (CHNUFPI, L.S. Carvalho). All measurements are in millimeters. Total body length includes carapace and abdomen without chelicerae and spinnerets. Length and width of carapace, eye tubercle, labium and sternum are measures of maximum values obtained. The length measurement of leg segments was obtained between joints in dorsal view. Terminology for number and disposition of spines follows that of PETRUNKEVITCH (1925) with modifications proposed by BERTANI (2001). Digital multi-focal photos were taken with a Leica DFC500 digital camera attached to a Leica MZ16A stereoscopic microscope. Extended focal range images were composed with Leica Application Suite version 2.5.0. SEM. These images were taken in the Scanning Electron Microscope FEI Quanta 250 in

the Laboratório de Biologia Celular of Instituto Butantan. Spermathecae were dissected and submitted to digestion by Ultrazyme® Enzymatic Cleaner for 24 hours in order to observe of the internal structure. The structures of internal genitalia of females were illustrated in dorsal view. Male palpal bulb from the left side was removed from the cymbium and illustrated. The geographic coordinates were obtained using Google Earth and the distribution maps were made using the program DIVA-GIS 7.5. Abbreviations: (PLS) posterior lateral spinnerets, (PMS) posterior median spinnerets, (AME) anterior median eyes, (ALE) anterior lateral eyes, (PLE) posterior lateral eyes, (PME) posterior median eyes, (STC) superior tarsal claws, (ap) apical, (d) dorsal, (v) ventral, (p) prolateral, (r) retrolateral.

## TAXONOMY

### Barychelidae Simon, 1889

#### *Neodiplothele* Mello-Leitão, 1917

*Neodiplothele* Mello-Leitão, 1917: 77, figs. 19-21 (Type-species by original designation, *Neodiplothele irregularis* Mello-Leitão, 1917); 1923: 111, figs. 28-31; 1924: 187; Vellard, 1924: 149, pl. 20, fig. 40; Mello-Leitão, 1926: 316, fig. 5; Mello-Leitão, 1939: 171; Bücherl, Timotheo & Lucas, 1971: 128, figs. 45-49; Raven, 1985: 102, figs. 120-125; Goloboff, 1995: 27.

Type species. *Neodiplothele irregularis* Mello-Leitão, 1917.

Diagnosis. Species of the genus *Neodiplothele* can be distinguished from the others Neotropical Sasoninae genera by the absence of the posterior median spinnerets (PMS). *Neodiplothele* resembles *Cosmopelma* and *Paracnobiopelma* by the apical segment of the posterior lateral spinnerets conical, labium and eye tubercle wider than long, however differs from *Cosmopelma* by the absence of cuspules on coxae of leg I and from *Paracnobiopelma* by the absence of cuspules on labium.

Description. Total length of males: 5.55-12.3 and females 7.76-16.75. Clypeus about as wide as long; eye tubercle raised, well defined. Anterior row of eyes procurved, posterior row slightly recurved (Fig. 1). Thoracic furrow small and slightly procurved. Labium wider than long, without cuspules. Rastellum formed by 6-25 short conical spines on promargin (Fig. 2). Intercheliceral tumescence in males, small, soft, pallid with few setae; maxillae rectangular, anterior lobe not well defined with 3-14 cuspules on inner corner. Plumose clavate trichobothria in two rows on the cymbium of the male palp and tarsus I of the female (Figs. 7-8). Trichobothria with conspicuous groove and filiform trachoma, distributed in two parallel rows in all metatarsi (Fig. 9). Tarsal organ elevated without longitudinal ridge originating from proximal end and with a very small receptor (Fig. 4). Tarsi I-IV of males pseudo-segmented. Scopulae present on tibia I-II and all metatarsi of females. STC of males with 1-5 teeth (Fig. 6), except in *N. irregularis*, *N. fluminensis* and *N. itabaiana* sp. nov., without teeth (Fig. 5); STC of the females without teeth on all claws.

Tibia I of males unmodified (Figs. 23-24), except in *N. fluminensis*, *N. itabaiana* sp. nov. and *N. martinsi* sp. nov. with megaspine (Figs. 31-32, 47-48, 57-58). Male palpal bulb with pyriform aspect in *irregularis* group (Figs. 18-21, 27-30, 35-38, 43-46, 53-56) or globose aspect in *picta* group (Figs. 68-71, 76-79, 87-90). Set of ventral keels marked near the embolus, not so well marked in *N. fluminensis* (Figs. 27-30) and *N. picta* (Figs. 68-71), and inconspicuous in *N. caucaia* sp. nov. (Figs. 87-90). Straighter embolus with a curve on the apical portion or with a strong sinuosity in *irregularis* group. Embolus long and very thin in *picta* group; with a slight curvature on the median region in *N. indicattii* sp. nov. (Figs. 76-79) or with a strong curvature (Figs. 68-71, 87-90). Female seminal receptacle with two branches emerging from a base. Large base in *picta* group (Figs. 73, 81) or narrowed in *irregularis* group (Figs. 25, 40, 50-51, 60-61). The internal branch with median sclerotization; sometimes strongly spiraled (Figs. 40, 73, 81) or slightly sinuous (Figs. 25, 50-51, 60-61). External branch straight without sinuosity, except in *N. indicattii* sp. nov. (Fig. 81). Duct of the external branch with median constriction in *irregularis* group. Lobes of the internal branch globose (Figs. 60-61) or filiform (Figs. 25, 50-51, 73). Posterior median spinnerets absent; apical segment of PLS very short with several spigots (Fig. 3).

Distribution. From Northeast to the north of the South of Brazil (Figs. 91-92).

Species included. *Neodiplothele irregularis* Mello-Leitão, 1917, *N. fluminensis* Mello-Leitão, 1924, *N. picta* Vellard, 1924, *N. aureus* sp. nov., *N. itabaiana* sp. nov., *N. martinsi* sp. nov., *N. indicattii* sp. nov., and *N. caucaia* sp. nov.

#### The *irregularis* group

This group is characterized by the pyriform aspect of the palpal bulb with slight curvature on the tip of the embolus (Figs. 18-21, 27-30, 35-38, 43-46, 53-56), and female seminal receptacle with a large base (Figs. 25, 40, 50-51, 60-61). Five species are included: *Neodiplothele irregularis*, *N. fluminensis*, *N. aureus* sp. nov., *N. itabaiana* sp. nov., and *N. martinsi* sp. nov.

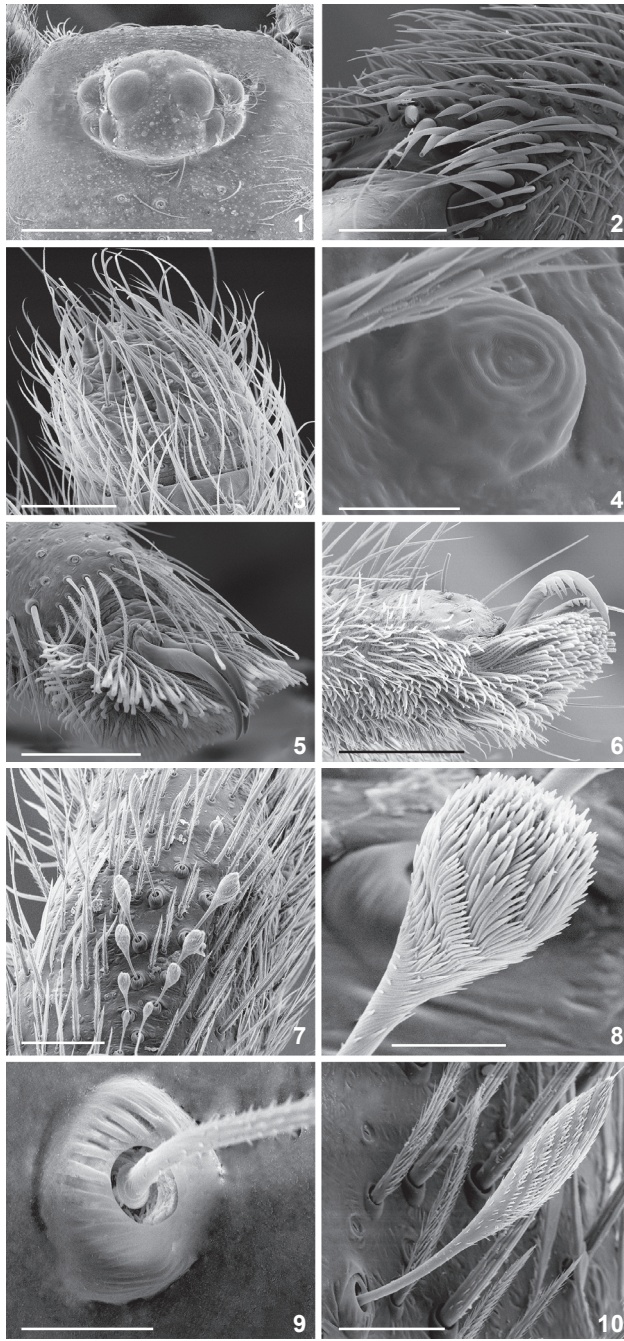
#### *Neodiplothele irregularis* Mello-Leitão, 1917

Figs. 1-5, 12, 17-25, 91

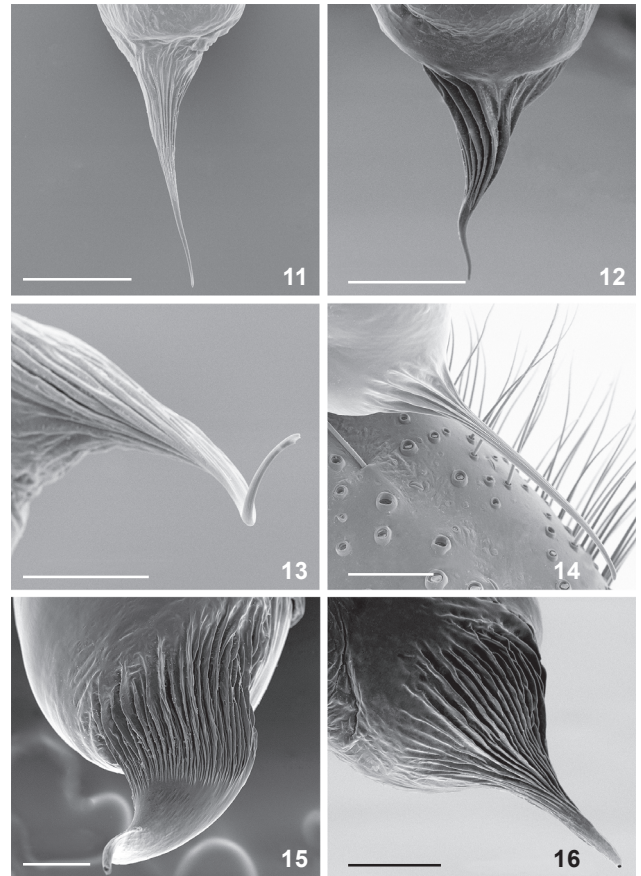
*Neodiplothele irregularis* Mello-Leitão, 1917: 77 figs. 19-21 (female holotype, BRAZIL, Paraíba: Campina Grande, T. Leitão leg., deposited in MNRJ 1276, examined); Mello-Leitão, 1923: 111, figs. 28-31; Raven, 1985: 102 figs. 120-123.

*Neodiplothele leonardosi* Mello-Leitão, 1939: 171 (immature, female holotype, BRAZIL, Bahia: Cabeceiras do Paraguaçu, O. Leonardo leg., deposited in MNRJ 42485, examined). **Syn. nov.**

Synonymy. *Neodiplothele leonardosi* is based on a juvenile specimen and is considered as junior synonym of *N. irregularis*, confirmed by the examination of several juveniles of the *N. irregularis* from the areas near the type locality and the color pattern.



Figures 1-10. (1-6) *Neodiplothele irregularis*: (1) eye tubercle; (2) rastellum; (3) apical segment of PLS; (4) tarsal organ; (5) STC of male without teeth; (6) *N. indicattii* sp. nov., STC of male with teeth. (7-10) *Neodiplothele fluminensis*: (7-10) clavate trichobothria, left palpal cymbium, dorsal view: (7) row of clavate trichobothria; (8) detail of apical segment of the clavate trichobothrium; (9) base of the clavate trichobothrium; (10) clavate trichobothrium. Scale bars: (1) 1 mm, (2, 5, 6, 9) 0.2 mm, (3, 4, 7, 8) 0.1 mm, (10) 0.04 mm.



Figures 11-16. *Neodiplothele*: (11-16) detail of the embolus: (11) *N. indicattii* sp. nov., prolateral view; (12) *N. irregularis*, retrolateral view; (13) *N. picta*, ventral view; (14) *N. fluminensis*, ventral view; (15) *N. aureus* sp. nov., ventral view; (16) *N. martinsi* sp. nov., ventral view. Scale bars: (11, 12) 0.2 mm, (13-16) 0.1 mm.

**Diagnosis.** Males of *Neodiplothele irregularis* can be distinguished from the other species of the group by the absence of megaspine on the tibia I (Figs. 22-23). Females are distinguished from the remaining species by the seminal receptacles with an uncoiled internal branch (Fig. 25).

**Description.** Male (IBSP 165120). Coloration in ethanol: carapace light brown with a clear central longitudinal stripe and two marginal lines, femora dark patella with two dark spots on each side, tibia and metatarsus with a basal dark ring and another apical. Abdomen light brown with numerous white spots on the dorsal side (Fig. 17). Total length 8.48. Carapace 4.44 long, 3.84 wide. Fovea: 0.58, slightly procurved. Clypeus: 0.2. Eyes group rectangular, wider than long: 1.5 long, 0.9 wide. Anterior eyes row procurved and posterior slightly recurved. Eyes size and interdistances: AME 0.23, ALE 0.25, PME 0.15, PLE 0.18. ALE-ALE 0.6, ALE-AME 0.03, AME-PME 0.05, PME-PME 0.45, PLE-PME 0.02, AME-AME 0.13, ALE-PLE 0.05. Labium: 0.28 long, 0.68

wide. Sternum: 2.36 long, 1.86 wide. Rastellum formed by 14 short conical spines on promargin. Endites with 3 cuspules each. Basal segment of chelicerae with row of 7 prolateral teeth and 10 smaller grouped basal ones. Palp: femur 2.15/patella 0.9/tibia 1.65/cymbium 0.95/total 5.65; leg I: femur 3.95/patella 2.45/tibia 3.25/metatarsus 3.8/tarsus 2.15/total 15.6; II: 4.25/1.6/3.3/3.65/1.95/14.75; III: 4.38/2.04/2.94/3.84/1.7/14.9; IV: 5.5/2.15/4.6/6/2.9/21.15. Spination: tarsi without spines; palp: femur p0-0-1; legs: I: femur d0-1-0-1-2-1ap, tibia v2-1-1p-2ap, metatarsus v0-3-0-0-1ap; II: femur d1-0-2-0-2-1, patella v0-0-1, tibia v2-1-1p-0-1p-0-2ap, metatarsus v0-1-2-1r-0-1-1ap; III: femur d0-2-0-2, patella p-1-1, tibia v0-1-1-0-1p-1-0-1p-0-2ap, d0-1-1-0, metatarsus v1p-1-1-0-1p-2-1-0-1p-0-3ap, d1-1-1-0; IV: femur d0-1-0-1-2, patella p0-1, tibia v0-3-0-1p-0-2ap, metatarsus v0-2-0-2, d1-1-0-1-0-2-0-1-0-2ap. Scopulae on tibia and metatarsus absent; tarsi I-II integral and III-IV divided by one narrow row of thin setae. STC without teeth on all claws. Palpal bulb pyriform, embolus with conspicuous keels and a light curvature near the apex (Figs. 12, 18-21). Spinnerets: basal segment 0.3; median 0.23; apical 0.05.

Female (MNRJ 1276). Coloration in ethanol as in male (Fig. 24). Total length 12. Carapace 5.04 long, 4.56 wide. Fovea: 0.75, procurved. Clypeus: 0.38. Eyes group rectangular, wider than long: 1.02 long, 1.38 wide. Anterior eyes row procurved and posterior slightly recurved. Eyes size and interdistances: AME 0.18, ALE 0.25, PME 0.13, PLE 0.20. ALE-ALE 0.73, ALE-AME 0.08, AME-PME 0.10, PME-PME 0.62, PLE-PME 0.03, AME-AME 0.25, ALE-PLE 0.08. Labium: 0.45 long, 1.8 wide. Sternum: 3.04 long, 2.23 wide. Rastellum formed by 19 short conical spines on promargin. Endites with 4 cuspules each. Basal segment of chelicerae with row of 9 prolateral teeth and group of 7 smaller basal ones. Palp: femur 3/patella 1.7/tibia 1.75/cymbium 1.4/total 7.85; leg I: femur 3.8/patella 2.75/tibia 2.55/metatarsus 2.3/tarsus 1.5/total 12.8; II: 3.6/2.5/2.45/2/1.2/11.75; III: 3.2/2.15/2.10/2.7/1.4/11.55; IV: 4.5/2.3/3.5/4.85/1.7/16.85. Spination: tarsi without spines; palp: femur r0-0-1; tibia v0-1p-1r-0-2-0-3ap; leg I: femur d0-0-1, tibia v1-0-1-0-2ap, metatarsus v0-2-0-1ap; II: femur d0-0-1, tibia v0-1-0-1-0-2ap, metatarsus v0-1-0-1-0-1ap; III: femur p0-0-1, patella p0-1-1, tibia r0-0-1, v0-1-0-1-3ap, metatarsus d1p-2-0-1-0-2, v2-1-1-0-0-3ap; IV: tibia p0-0-1ap, metatarsus v0-2-1p-2-0-2-0-1-1p-0-3ap. Scopulae on tibia I-II 2/3, III 1/4, IV absent; metatarsi I-II integral, III 1/3 and IV absent; tarsi I-IV integral. STC without teeth on all claws. Spermathecae with large base; internal branch slightly sinuous (Fig. 25). Spinnerets: basal segment 0.65; median 0.43; apical 0.25.

Variation. Males (n = 10): total length 7.7-10.04; carapace 3.52-5 long; 2.88-4.38 wide; femur I 3.12-4.56. Females (n = 10): total length 10.48-12.3; carapace 3.84-5.1 long; 3.42-4.5 wide; femur I 2.04-3.25.

Additional material examined. BRAZIL, *Piauí*: Alvorada do Gurguéia, Fazenda Escola do Piauí (08°22'28.6"S, 43°51'32.5"W), 2 females and 2 juveniles, 15-17.II.2012, I.L.F. Magalhães et al. leg. (IBSP 165099); Coronel José Dias, Parque Nacional da Serra da Capivara (08°50'4"S, 42°33'18"W), 1 juvenile, 8.V.2012, L.S.



Figures 17-25. *Neodiplothele irregularis*: (17-23) male (IBSP 165120): (17) habitus, dorsal view; (18-21) left male palpal bulb: (18) dorsal view; (19) ventral view; (20) prolateral view; (21) retrolateral view; (22-23) left tibia of the leg I; (22) ventral view; (23) prolateral view. 24-25) female (MNRJ 1276): (24) habitus, dorsal view; (25) spermathecae, dorsal view. Scale bars: (17, 24) 2.0 mm, (22-23) 1.0 mm, (18-21) 0.5 mm, (25) 0.2 mm.

Carvalho et al. leg. (CHNUFPI 05597); Guaribas, Parque Nacional da Serra das Confusões (09°13'16"S, 43°29'21"W), 2 males, X.2006, P.R.R. Silva et al. leg. (IBSP 165102; IBSP 165103); São Raimundo Nonato, Parque Nacional Serra da Capivara (08°52'46.6"S, 42°43'14.8"W), 1 juvenile, 19.II.2012, I.L.F. Magalhães et al. leg. (IBSP 165106). Ceará: Aiuaba, Estação Ecológica do Aiuaba (6°40'9.3"S, 40°10' 47.5"W), 1 female,

8.V.2012, I.L.F. Magalhães et al. leg. (IBSP 165118); Ipú, Chapada da Ibiapaba (4°19'19"S, 40°42'39"W), 2 females, 6-16.XII.2002, G. Skuk leg. (IBSP 121813-121814). *Paraíba*: Araruna, Parque Estadual da Pedra da Boca (06°27'16.5"S, 35°40'45.5"W), 1 juvenile, 2.VI.2012, I.L.F. Magalhães & J.L. Chavari leg. (IBSP 165100); Cabaceiras (07°29'20"S, 36°17'14"W), 1 male, 2003 (IBSP 165120); 1 male, 18.IX.2011, J.B.R. Alencar leg. (CHNUFPI 0983); São José do Cordeiro, RPPN Fazenda das Almas (07°23'27"S, 36°48'28"W), 20 males and 2 females, 2008-2009, A. Vasconcelos leg. (IBSP 165107-165117; IBSP 165119; IBSP 165150-165154). *Pernambuco*: Caruaru (08°16'58"S, 35°58'33"W), 21 males, 2008-2009. H.P. Amorim leg. (IBSP 161832-161851); Recife, Horto Dois Irmãos (8°0'44.197"S, 34°56'45.991"W), 2 males, VII-XI.2000, M. Perez leg. (IBSP 11651-11652). *Sergipe*: Canindé de São Francisco, Usina Hidrelétrica de Xingó (09°37'15.21"S, 37°47'27.89"W), 5 males, 1-29.III.2001, Equipe Biota leg. (IBSP 165096-165098); Santa Luzia do Itanhhy (11°21'3"S, 37°26'52"W), 1 female, IX.1999, A.D. Bescovit leg. (IBSP 8614); São Cristóvão (11°0'54"S, 37°12'21"W), 1 male, IV.2008, (IBSP 11274). *Bahia*: Una, Estação Ecológica de Una (15°17'34"S, 39°4'30"W), 1 female, IX.99-IX.2000, Equipe Biota leg. (IBSP 11455); Anagé, Lindo Horizonte (14°36'43"S, 41°8'9"W), 2 females, 3.VII.2002, A. Zanotti leg. (IBSP 10313); Contendas do Sincorá, Floresta Nacional Contendas do Sincorá, Trilha Aroeira (13°45'46"S, 41°2'27"W), 2 females, 12-14.I.2012, I.L.F. Magalhães et al. leg. (IBSP 165104); Luís Eduardo Magalhães (12°5'31"S, 45°48'18"W), 1 male, 14-22.X.2002, D. Pavan leg. (MZSP 42535); Conde (11°48'50"S, 37°36'39"W), 1 male, 4 juveniles, 21.X.2006, Y.P. Souza & A.O. Alves leg. (IBSP 13782-IBSP 13786); Central, (11°8'9"S, 42°6'46"W), 2 females, 20.II.2000, Equipe Biota leg. (IBSP 165148-165149); Miguel Calmon (11°25'44"S, 40°35'42"W), 1 female, 24.I.2012, I.L.F. Magalhães et al. leg. (IBSP 165105); Jandaíra, Mangue Seco (11°33'50"S, 37°47'2"W), 1 male, (IBSP 13710); Milagres (12°54'21.2"S, 39°50'53.7"W), 1 female, 16.III.2012, E.S. Araújo & A.S. Medeiros leg. (CHNUFPI 0995); Morro do Chapéu (11°29'51.2"S, 41°19'49"W), 1 female, 1 juvenile, 20.I.2012, I.L.F. Magalhães et al. leg. (IBSP 165165); Paulo Afonso, Estação Ecológica do Raso da Catarina (9°39'58.1"S, 38°28'15.1"W), 1 male, 22-23.VI.2012, I.L.F. Magalhães & J.L. Chavari leg. (IBSP 165101); Senhor do Bonfim (10°27'46"S, 40°11'27"W), 1 male, III.2008, J.S. Costa leg. (IBSP 133791); Ilhéus (14°47'20"S, 39°2'56"W), 1 female, 2014, C.M.P. Leite leg. (IBSP 166180); Itamaraju (17°2'20"S, 39°31'51"W), 3 females, 2014, C.M.P. Leite leg. (IBSP 166177-166179).

Distribution. BRAZIL: states of Bahia, Ceará, Paraíba, Pernambuco, Piauí and Sergipe (Fig. 91).

### *Neodiplothele fluminensis* Mello-Leitão, 1924

Figs. 7-10, 14, 26-33, 91

*Neodiplothele fluminensis* Mello-Leitão, 1924: 187 (male holotype, BRAZIL, *Rio de Janeiro*: Rio de Janeiro, Floresta da Tijuca, W.S. Bristowe leg., MNRJ 1277, examined); Mello-Leitão, 1926: 316, fig. 5; Raven, 1985: 102, figs. 124-125.

*Trichopelma annulata* Mello-Leitão, 1943: 258 (male holotype from BRAZIL, *Rio de Janeiro*: Rio de Janeiro, Copacabana, O. Leonardos leg., MNRJ 58299, examined); Bücherl, Timotheo & Lucas, 1971: 128, figs. 45-49 (Syn.).

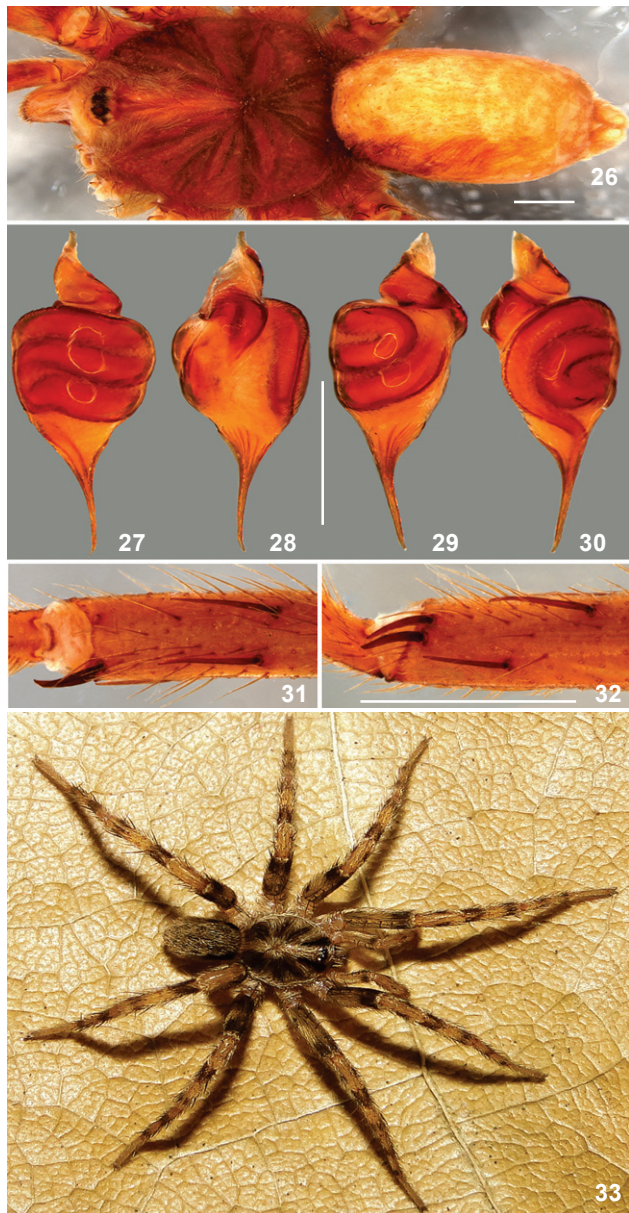
Diagnosis. Males of *Neodiplothele fluminensis* can be distinguished from the all other species by the long and thin embolus (Figs. 14, 27-30) and by the presence of two apical megaspines on the prolateral side of tibia I (Figs. 31-32).

Description. Male (IBSP 165141). Coloration in ethanol: carapace light brown with a clear central longitudinal stripe, femora dark, patella with two lateral black spots, tibia and metatarsus with a dark ring in the middle. Spinnerets with lateral black spots on the basal segment. Abdomen light brown with white spots on the dorsal side (Fig. 26). Coloration in vivo: general aspect light brown, a clear central longitudinal stripe on the dorsal side of the carapace. Femora, patella, tibia and metatarsus with dark spots (Fig. 33). Total length 7.5. Carapace 4.44 long, 3.6 wide. Fovea: 0.25, slightly procurved. Clypeus: 0.18. Eyes group rectangular, wider than long: 0.5 long, 0.68 wide. Anterior eyes row procurved and posterior slightly recurved. Eyes size and interdistances: AME 0.13, ALE 0.18, PME 0.10, PLE 0.15. ALE-ALE 0.43, ALE-AME 0.03, AME-PME 0.05, PME-PME 0.28, PLE-PME 0.01, AME-AME 0.10, ALE-PLE 0.03. Labium: 0.68 long, 0.18 wide. Sternum: 1.98 long, 1.61 wide. Rastellum formed by 12 short conical spines on promargin. Endites with 3 cuspules each. Basal segment of chelicerae with row of 7 prolateral teeth and 5 smaller grouped basal ones. Palp: femur 1.8, patella 1.05, tibia 1.25, cymbium 0.3, total 4.4; leg I: femur 3.55, patella 1.75, tibia 2.6, metatarsus 2.8, tarsus 1.75, total 12.45; II: 3.7, 1.8, 2.8, 2.7, 1.75, 12.75; III: 3, 1.7, 2.5, 3.2, 1.8, 12.2; IV: 4.1, 2, 4, 4.5, 1.75, 16.35. Spinination: tarsi without spines; leg I: femur d0-0-1r, tibia v2-0-2-1r-3ap, metatarsus v0-2-0-1; II: femur d0-0-1r, tibia v2-0-2-2ap, metatarsus v0-1-0-1; III: femur d0-0-1p, patella d0-1-2, tibia r0-1, metatarsus d0-1o-1, v-1-0-1-2-0-4ap; IV: femur d1-2-0-1p, tibia v0-2-1r-0-1p-0-1-1-0-1p-3ap, metatarsus d0-1-1p-1r-1-0-1p-1v-0-2-1ap. Scopulae on tibia and metatarsus absent; tarsi I-IV integral. STC without teeth on all claws. Tibia I with two megaspines on the prolateral side (Figs. 31-32). Palpal bulb with a thin embolus with a light apical curvature (Figs. 27-30). Spinnerets: basal segment 0.5; median 0.2; apical 0.1.

Female. Unknown.

Variation. Males (n = 8) total length 4.98-7.5; carapace 2.58-4.44 long, 2.28-3.6 wide; femur I 2.1-3.55.

Additional material examined. BRAZIL: *Espírito Santo*: São Matheus (18°43'15"S, 39°51'41"W), 1 juvenile, VI.1997, J. Raizer leg. (IBSP 11282); Linhares, (19°23'27"S, 40°04'19"W), 1 male and 2 juveniles, VII.1997, A.D. Bescovit leg. (IBSP 11278, IBSP 11527). *Rio de Janeiro*: Teresópolis, Parque Nacional da Serra dos Órgãos 22°27'07"S, 42°59'26"W, 1 juvenile, 18-31.XII.2011. R.P. Indicatti & B. Gambaré leg. (IBSP 165143); (22°29'35"S, 43°4'24"W), 1 male, 10-22.XI.2010. R.P. Indicatti, F.U. Yamamoto & J.A.P.P. Barbosa leg. (IBSP 165141); 2 males and 1 juvenile,



Figures 26-33. *Neodiplothele fluminensis*: male (MNRJ 1277). (26) habitus, dorsal view; (27-30) left male palpal bulb: (27) dorsal view; (28) ventral view; (29) prolateral view; (30) retrolateral view; (31-32) left tibia of the leg I; (31) ventral view; (32) prolateral view; (33) live specimen from Parque Nacional Serra dos Órgãos, Teresópolis, Rio de Janeiro. Photo: Rafael P. Indicatti. Scale bars: (26) 2.0 mm, (31-32) 1.0 mm, (27-30) 0.5 mm.

23.VII.2001, Equipe Biota leg. (IBSP 132219, IBSP 132266-132267); Rio de Janeiro, Parque Nacional da Tijuca (22° 57'47"S, 43°14'40"W), 1 male, I.2000, R.L.C. Baptista leg. (MNRJ 6826); Nova Iguaçu, Reserva Biológica do Tinguá, (22°45' 37.16"S,

43°26'51.82"W), 4 juveniles, 2002, E. Folly-Ramos leg. (IBSP 165142); Cachoeiras de Macacu, Reserva Ecológica Guapiassu (22°27'46"S, 42°39'10"W), 1 male, 08-15.XI.2001, Equipe Biota leg. (IBSP 13159). Santa Catarina: Balneário Camboriú, Parque Unipraias (27°00'28"S, 48°36'25"W), 3 males, 29.VIII.2011, M.Z. Junior leg. (IBSP 165144); São Francisco do Sul, Centro de Estudos e Pesquisas Ambientais Vila da Glória (26°14'34"S, 48°38'16"W), 2 males, 12-15.XII.2011, I.F.L. Magalhães et al. leg. (UFMG 10285).

Distribution. BRAZIL: states of Espírito Santo, Rio de Janeiro, and Santa Catarina (Fig. 91).

Natural history. This species was found in ravines, at about 10-50 cm high from the ground on tracks edges in the Atlantic Forest, in the Parque Nacional da Serra dos Órgãos, Teresópolis, Rio de Janeiro (about 1400m above the sea level). The burrow has two trapdoors camouflaged with mosses on substrates as soil, rocks, roots or fallen trunks in ravines.

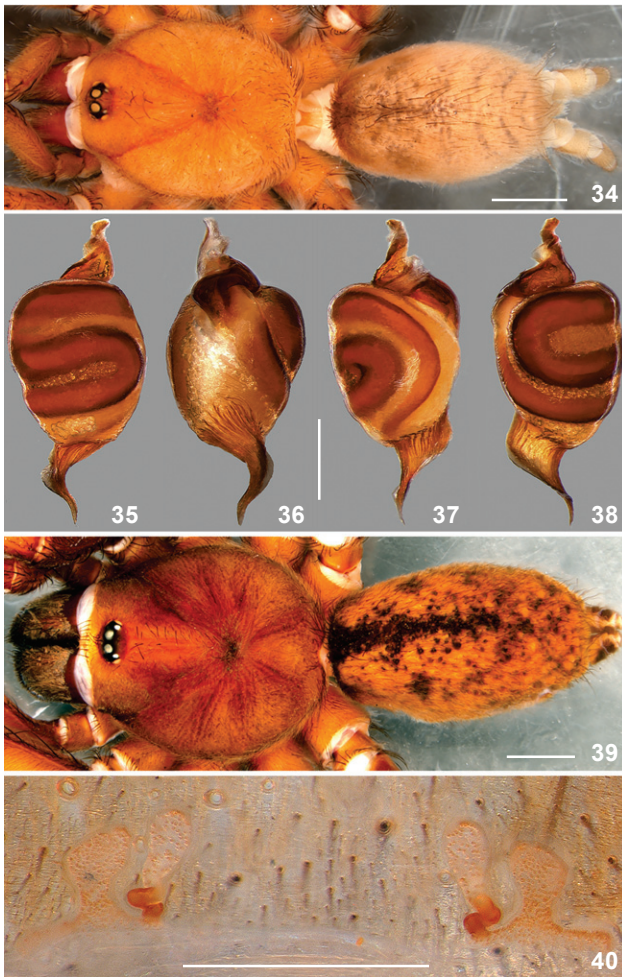
### *Neodiplothele aureus* sp. nov.

Figs. 15, 34-41, 91

Type material. Male holotype from BRAZIL, Rio Grande do Norte: Serra Negra do Norte, Estação Ecológica de Seridó, 06°39'57"S, 37°23'49"W, 10-21.XII.2007, M. Maia leg., deposited in IBSP 124209. Paratypes: 3 males with the same data of holotype, deposited in MZSP 67530 and UFMG 17298, 3 females from BRAZIL: Minas Gerais: Leme do Prado, Estação Ecológica Mata de Acauã, 17°7'56"S, 42°43'58.9"W, 18-28. II.2013, P.H. Martins leg., deposited in IBSP 123395 and UFMG 12985.

Diagnosis. *Neodiplothele aureus* sp. nov. can be distinguished from the other species by the golden dorsal color in the abdomen with a median longitudinal dark brown strip (Fig. 41). Males palpal bulb embolus with evident keels emerging from an enlarged base (Figs. 15, 35-38). Females can be distinguished by the more spiraled internal branch and longer than the external one (Fig. 40).

Description. Male (IBSP 124209). Coloration in ethanol: general aspect golden, abdomen dorsally with a dark brown median stripe (Fig. 34). Total length 12.3. Carapace 5.76 long, 4.2 wide. Fovea: 0.6, slightly procurved. Clypeus: 0.2. Eyes group rectangular, wider than long: 0.66 long, 0.96 wide. Anterior eyes row procurved and posterior slightly recurved. Eyes size and interdistances: AME 0.23, ALE 0.28, PME 0.1, PLE 0.25. ALE-ALE 0.7, ALE-AME 0.05, AME-PME 0.08, PME-PME 0.5, PLE-PME 0.03, AME-AME 0.15, ALE-PLE 0.05. Labium: 0.5 long, 1 wide. Sternum: 2.98 long, 2.3 wide. Rastellum formed by 20 short conical spines on promargin. Endites with 13 cuspules each. Basal segment of chelicerae with row of 9 prolateral teeth and 8 smaller grouped basal ones. Palp: femur 2.8/patella 1.5/tibia 1.85/cymbium 1.25/total 7.4; leg I: femur 5/patella 2.8/tibia 3.5/metatarsus 4.05/tarsus 2.15/total 17.5; II: 4.75/2.5/3.15/4.1/2.1/16.6; III: 4.55/2.5/3.4/5/2.5/17.95; IV 5.45/3.1/4.6/6.15/2.95/22.25. Spination: tarsi without spines; Palp: femur d0-0-1-1-2-1-2ap, tibia d0-1-1-1p-1p-0-1-2ap; leg I: femur d0-



Figures 34-40. *Neodiplothele aureus* sp. nov. (34-38) male (IBSP 124209): (34) habitus, dorsal view; (35-38) left male palpal bulb: (35) dorsal view; (36) ventral view; (37) prolateral view; (38) retrolateral view; (39-40) female (IBSP 123395): (39) habitus, dorsal view; (40) spermathecae, dorsal view. Scale bars: (34, 39) 2.0 mm, (35-38, 40) 0.5 mm.

0-1-3, patella d0-1-0, tibia v2-0-1-1-0-1-1-1-0-2ap, p0-1-1, metatarsus v1p-2-0-1-1-0-0-3ap; II: femur d0-1-0-2-1, patella d0-2-1-0, tibia v1-1-1-2-1-1-0-3ap, metatarsus v-1-2-0-1-2-1r-0-0-1p-2ap; III: femur v1-2-1-0-2-1p, patella d0-2-1-0, tibia v2-1p-1p-0-2-0-1p-0-3ap, metatarsus v1p-0-2-1p-0-1-1-1-0-3ap; IV femur d0-1-1-1-0-1-2, patella d0-2-1-0, tibia d3-0-2-1-0-1r-2-1p-0, v0-3-0-2-0-0-2ap, metatarsus d0-3-0-2-0-1p-0-1-0-2-1, v0-0-2-0-0-2-0-2ap. Scopulae on tibia and metatarsus absent; tarsi I-II integral and III-IV divided by one narrow row of thin setae. STC I with 5 teeth, II-IV with 4. Palpal bulb with an enlarged base of the embolus and with several very evident keels on sinuous distal area (Figs. 15, 35-38). Spinnerets: basal segment 1; median 0.6; apical 0.3.



Figure 41. *Neodiplothele aureus* sp. nov. female from Leme do Prado, Minas Gerais (IBSP 123395). Photo: Pedro H. Martins.

Female (IBSP 123395). Coloration in ethanol as in male (Fig. 39). Coloration in vivo: carapace dark brown with a median golden stripe, dorsal side of the abdomen golden with a dark brown stripe and many brown spots, legs light brown, except trochanter yellowish-brown, dorsal side of chelicerae with dark brown setae (Fig. 41). Total length 16.75. Carapace 8.75 long, 7.25 wide. Fovea: 1.08, slightly procurved. Clypeus: 0.3. Eyes group rectangular, wider than long: 1.08 long, 1.5 wide. Anterior eyes row procurved e posterior slightly recurved. Eyes size and interdistances: AME 0.33, ALE 0.35, PME 0.15, PLE 0.33. ALE-ALE 1.03, ALE-AME 0.18, AME-PME 0.13, PME-PME 0.9, PLE-PME 0.05, AME-AME 0.3, ALE-PLE 0.13. Labium: 0.6 long, 1.5 wide. Sternum: 1.22 long, 0.93 wide. Rastellum formed by 25 short conical spines on promargin. Endites with 14 cuspules each. Basal segment of chelicerae with a row of 10 prolateral teeth and 17 smaller grouped basal ones. Palp: femur 4.6/patella 2.75/tibia 3.1/cymbium 2.5/total 12.95; leg I: femur 6/patella 4/tibia 4.4/metatarsus 3.7/tarsus 2/total 20.1; II: 5.88/3.42/3.9/3.48/2.1/18.78; III: 5.7/3.24/3.6/4.38/2.04/18.96; IV: 6.72/3.6/5.52/7.26/2.64/25.74. Spination: tarsi without spines; Palp: femur p0-0-1, tibia v1p-0-1-2-3ap; leg I: femur p0-0-1, r1-0-1-0, p0-0-1, metatarsus v0-2-0-0-1ap; II: femur p0-0-1, patella p0-1, tibia v0-1-0-1, metatarsus v0-2-0-0-1ap; III: femur d0-0-2, patella p0-1-1, tibia p0-1-0-1-1ap, metatarsus d0-0-1-0-1, v0-1p-1-2-0-1-0-2-0-4ap; IV: tibia v0-0-1p-1r-1ap, metatarsus v0-0-1-1-2-0-1-1-1p-0-4ap. Scopulae on tibia I-II ½, III 2/3, IV absent; metatarsi I-III integral and metatarsus IV absent; tarsi I-II integral and III-IV divided by one narrow row of thin setae. STC without teeth on all claws. Spermathecae with large base of the seminal receptacles; external branch with

large duct (Fig. 40). Spinnerets: basal segment 0.83; median 0.38; apical 0.25.

Variation. Males (n = 10) total length 10.7-12.1; carapace 4.8-5.94 long, 3.84-4.68 wide; femur I 4.4-5. Females (n = 5) total length 9.25-18.25; carapace 4.9-8.4 long, 3.96-6.6 wide; femur I 3.18-5.88.

Additional material examined. BRAZIL: Ceará: Fortaleza, Itaperi (03°47'18.9"S, 38°33'30"W), 2 males, 12.IX.2010, R. Azevedo leg. (IBSP 164548-164549). Paraíba: São José do Cariri, (07°23'27"S, 36°31'58"W), 1 male, 2008-2009, S.C. Dias leg. (IBSP 165137); São José do Cordeiro, RPPN Fazenda das Almas (07°23'27"S, 36°48'28"W), 1 male, 2008-2009, A. Vasconcelos leg. (IBSP 165138). Rio Grande do Norte: Serra Negra do Norte, Estação Ecológica de Seridó (06°39'57"S, 37°23'49"W), 28 males, 10-21.XII.2007-VI.2008, M. Maia leg. (IBSP 123385-123394; IBSP 123430-123437; IBSP 124193-124195; IBSP 124203-124204; IBSP 124207-124208). Minas Gerais: Leme do Prado, Estação Ecológica Mata de Acauã (17°7'56"S, 42°43'58.9"W), 2 females, 18-28.II.2013, P.H. Martins leg. (UFMG 12705-12706); São Gonçalo do Rio Abaixo, Estação de Preservação e Desenvolvimento Ambiental de Peti (19°58'23"S, 43°29'57"W), 1 female, 8-9.XII.2012, G.H.F. Azevedo et al. leg. (UFMG 12344).

Distribution. BRAZIL: states of Ceará, Minas Gerais, Paraíba, and Rio Grande do Norte (Fig. 91).

Etymology. The species is a noun in apposition from its golden color (Fig. 41).

### *Neodiplothele itabaiana* sp. nov.

Figs. 42-51, 92

Type material. Male holotype, BRAZIL, Sergipe: Itabaiana, gruta in the Parque Nacional Serra de Itabaiana, 10°45'0.2"S, 37°20'26"W, 188 m, 19-20.V.2012, I.L.F. Magalhães and J.L. Chavari leg., deposited in IBSP 165121. Paratypes: 2 females and one female with the same data of holotype, deposited in IBSP 165122 and IBSP 165123.

Diagnosis. Males of *Neodiplothele itabaiana* sp. nov. can be distinguished by the aspect of the palpal bulb with straight distal spermatic duct (Fig. 45) and enlarged base of embolus (Figs. 43-46). Females can be distinguished by the large base of the spermathecae with the internal branch not very coiled (Figs. 50-51).

Description. Male (IBSP 165121). Coloration in ethanol: general aspect brown with many light brown setae; femora dark (Fig. 42). Total length 12.3. Carapace 5.6 long, 5.1 wide. Fovea: 0.5, slightly procurved. Clypeus: 0.15. Eyes group rectangular, wider than long: 0.6 long, 0.9 wide. Anterior eyes row procurved e posterior slightly recurved. Eyes size and interdistances: AME 0.33, ALE 0.23, PME 0.15, PLE 0.18. ALE-ALE 0.68, ALE-AME 0.05, AME-PME 0.05, PME-PME 0.58, PLE-PME 0.03, AME-AME 0.25, ALE-PLE 0.08. Labium: 0.5 long, 0.98 wide. Sternum: 2.9 long, 2.6 wide. Rastellum formed by 15 short conical spines on promargin. Endites with 9 cuspules each. Basal segment of chelicerae with row of 9

prolateral teeth and 11 smaller grouped basal ones. Palp: femur 3/patella 1.9/tibia 2.3/cymbium 1.1/total 8.3; leg I: femur 6/patella 3.2/tibia 4.15/metatarsus 5/tarsus 3.45/total 21.8; II: 5.6/2.55/4.5/5/2.5/20.15; III: 5.25/2.5/4.2/5.55/2.7/20.2; IV: 6.35/2.95/5.6/6.8/3.2/24.9. Spination: tarsi without spines; palp: femur d0-0-1, tibia; leg I: femur d0-0-2-0-1, tibia v2-0-0-1-1p-1-0-2-0-1ap, metatarsus v0-1p-1r-0-0-0-1ap; II: femur d0-0-1-2-2-1, patella v0-0-1, tibia v0-2-0-1-2-0-2-0-2ap, metatarsus v0-2-0-1p-1r-0-0-1r-1ap; III: femur d0-1-0-1-2-0-1ap, patella p0-0-1-1, tibia d1-1-0-2-0-2-0-2, v0-2-0-0-2-0-2ap, metatarsus d0-1-1-0-1-1-0-1, v0-1-1-0-1-2-0-1p-1r-0-3ap; IV: femur d1-0-0-2-0-2, patella p0-0-1-1, tibia d0-2-0-2-0-1-1p-1r-0, v0-2-0-0-2-1-0-0-2ap, metatarsus d0-1-0-1-0-1, v1p-1r-0-1-1-0-2-0-0-1-1-0-1-3ap. Scopulae on tibia and metatarsus absent; tarsi I-II integral and III-IV divided by one narrow row of thin setae. STC without teeth on all claws. Tibia I with a megaspine on the retrolateral side (Figs. 47-48). Palpal bulb with evident keels and an apical curvature in the embolus (Figs. 43-46). Spinnerets: basal segment 0.8; median 0.45; apical 0.23.

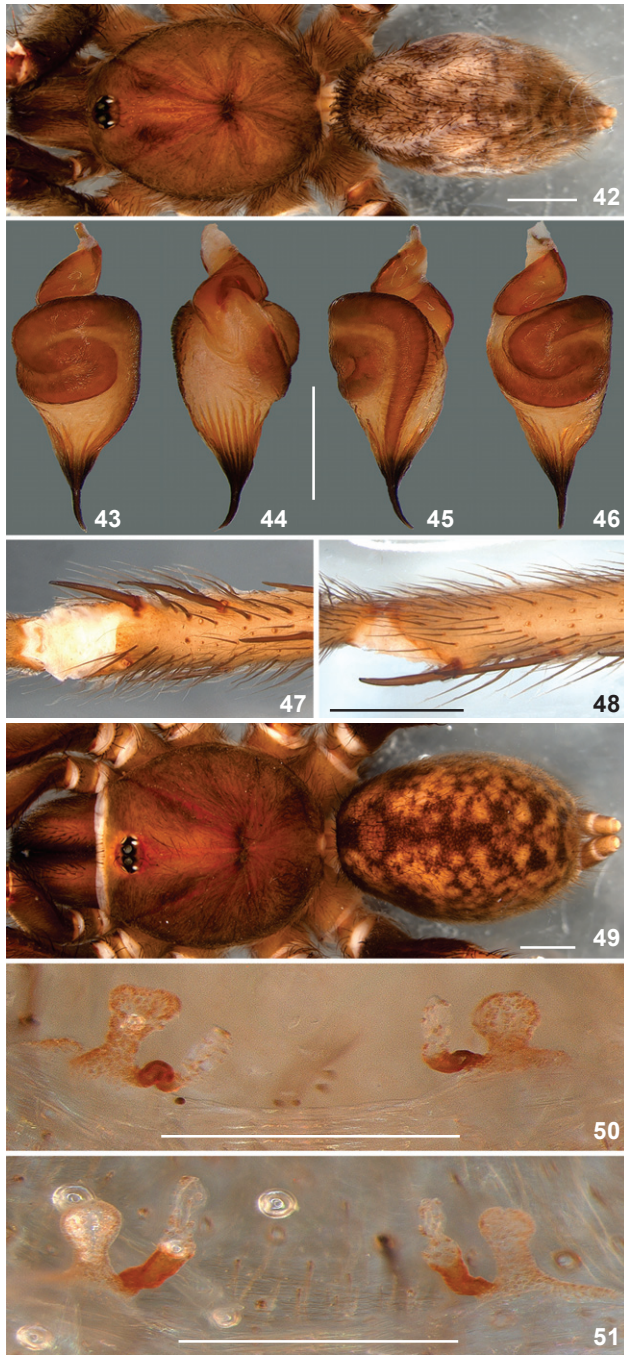
Female (IBSP 165122). Coloration in ethanol as in male (Fig. 49). Total length 15.75. Carapace 7.8 long, 6.6 wide. Fovea: 1.5, slightly procurved. Clypeus: 0.45. Eyes group rectangular, wider than long: 0.9 long, 1.2 wide. Anterior eyes row procurved e posterior slightly recurved. Eyes size and interdistances: AME 0.28, ALE 0.35, PME 0.15, PLE 0.33. ALE-ALE 0.69, ALE-AME 0.05, AME-PME 0.1, PME-PME 0.63, PLE-PME 0.05, AME-AME 0.15, ALE-PLE 0.06. Labium: 0.63 long, 1.45 wide. Sternum: 4.45 long, 3.66 wide. Rastellum formed by 22 short conical spines on promargin. Endites with 13 cuspules each. Basal segment of chelicerae with row of 11 prolateral teeth and 10 smaller grouped basal ones. Palp: femur 4.5/patella 3/tibia 2.75/cymbium 2.5/total 12.75; leg I: femur 6.05/patella 4.15/tibia 4/metatarsus 3.75/tarsus 2.15/total 20.1; II: 5.75/3.75/3.5/3.4/2/18.4; III: 5/3.25/3/3.25/1.75/16.25; IV: 6.75/4.25/5/7.05/2.3/25.35. Spination: tarsi without spines; palp: femur p0-0-1, tibia v2-0-1r-0-2-1p-1r-3ap; leg I: femur p0-0-1, tibia r0-1-0-1-0-0-1-0-2ap, metatarsus v2-0-0-0-1ap; II: femur p0-0-1, tibia d-0-1-0, v1-0-1-0-3ap, metatarsus v0-2-0-0-1ap; III: femur p0-0-1-1, tibia d0-2-0-2-0, v0-2-0-2-0-2ap, metatarsus d1p-0-1-0-2-0-2, v0-1-1-0-0-2-0-3ap; IV: tibia p0-1-0, metatarsus v0-0-0-1-1p-1-1r-0-0-1-1-1p-0-1-3ap. Scopulae on tibia I-II 3/4, III 1/3 and IV absent; metatarsi I-III integral and IV absent; tarsi I-IV integral. STC without teeth on all claws. Spermathecae with large base, internal branch with slighter or stronger sinuosity (Figs. 50-51). Spinnerets: basal segment 1.25; median 0.33; apical 0.2.

Distribution. Only known from the type locality (Fig. 92).

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

Variation. Females (n = 2) total length 11.5-15.75; carapace 5.7-7.8 long, 5.04-6.6 wide; femur I 4.56-6.05. Internal branch of spermathecae could be variable to coiled (Fig. 50) and sinuous (Fig. 51).





Figures 42-51. *Neodiplothele itabaiana* sp. nov. (42-48) male (IBSP 165121): (42) habitus, dorsal view; (43-46) left male palpal bulb: (43) dorsal view; (44) ventral view; (45) prolateral view; (46) retrolateral view; (47-48) left tibia of the leg I; (47) ventral view; (48) retrolateral view; (49-51) female (IBSP 165122): (49) habitus, dorsal view; (50) spermathecae, dorsal view; female (IBSP 165123): (51) spermathecae, dorsal view. Scale bars: (42, 49) 2.0 mm, (47, 48) 1.0 mm, (43-46, 50, 51) 0.5 mm.

### *Neodiplothele martinsi* sp. nov.

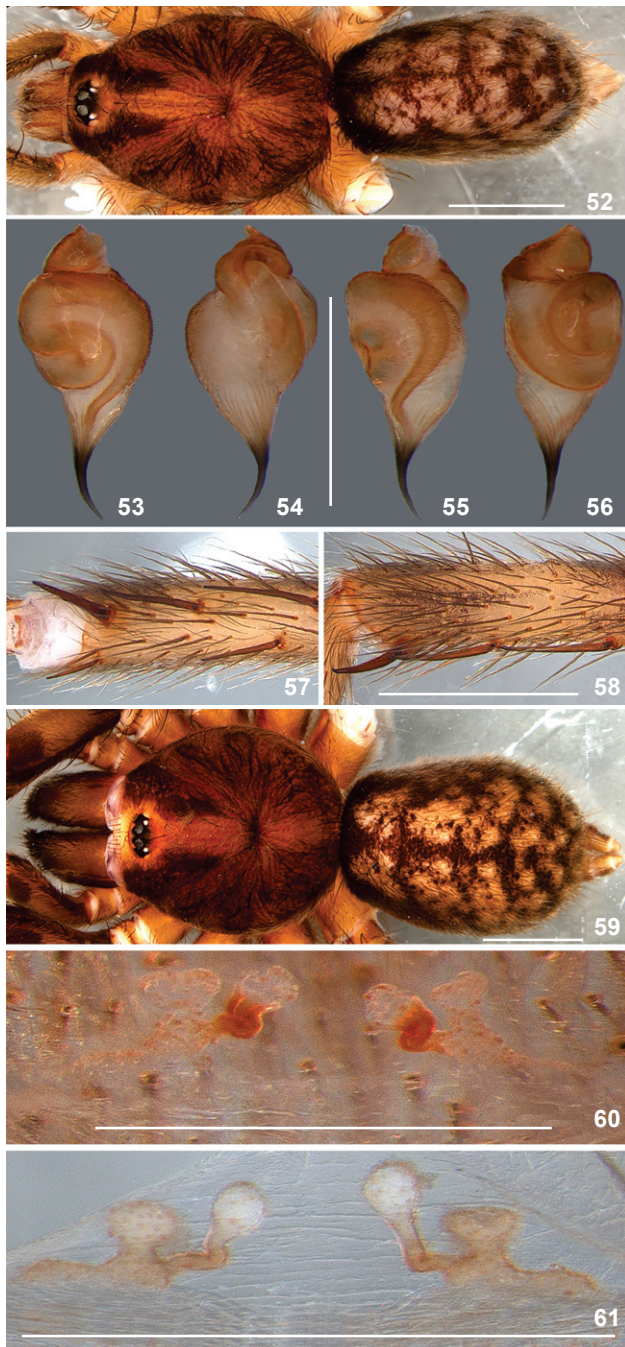
Figs. 16, 52-66, 92

Type material. Male holotype from BRAZIL: *Minas Gerais*, Santana do Riacho, Parque Nacional Serra do Cipó, 19°15'S, 43°31'W, 21-26.VI.2002, Equipe Biota leg., deposited in IBSP 13190. Paratypes: 1 female with the same data of holotype, deposited in IBSP 13191; 1 male and 2 females from *Minas Gerais*, Leme do Prado, Estação Ecológica Mata de Acauã, 17°7'56"S, 42°43'58.9"W, 18-28.II.2013, P.H. Martins leg., deposited in UFMG 12708 and UFMG 12986.

Diagnosis. Males of *Neodiplothele martinsi* sp. nov. can be distinguished by the aspect of the palpal bulb with a sinuous distal spermatic duct (Fig. 55). Female can be distinguished by the slight sinuous internal branch with globose lobes (Figs. 60-61).

Description. Male (UFMG 12708). Coloration in ethanol: carapace brown; abdomen with many light brown spots on dorsal side; femora dark; tibia and metatarsus with dark spots on the base and the apex of each segment (Fig. 52). Coloration in vivo: general aspect dark brown, carapace with a yellowish-brown stripe central and two marginal lines; abdomen with many yellowish-brown spots; femora dark; patella with two dark spots on the both sides; tibia and metatarsus with a dark ring on the base and another apical (Fig. 63). Total length 6.32. Carapace 3.06 long, 2.4 wide. Fovea: 0.23, slightly procurved. Clypeus: 0.1. Eyes group rectangular, wider than long: 0.34 long, 0.59 wide. Eyes size and interdistances: AME 0.13, ALE 0.15, PME 0.75, PLE 0.13. ALE-ALE 0.38, ALE-AME 0.05, AME-PME 0.03, PME-PME 0.35, PLE-PME 0.03, AME-AME 0.1, ALE-PLE 0.03. Labium: 0.2 long, 0.6 wide. Sternum: 1.58 long, 1.43 wide. Rastellum formed by 10 short conical spines on promargin. Endites with 5 cuspules each. Basal segment of chelicerae with row of 7 prolateral teeth and 10 smaller grouped basal ones. Palp: femur 1.4/patella 1/tibia 1.1/cymbium 0.5/total 4; leg I: femur 2.6/patella 1.55/tibia 2.4/metatarsus 2.5/tarsus 1.9/total 10.95; II: 3/1.05/2/2.55/1.75/10.35; III: 2.8/1.7/2.3/2.85/1.6/11.25; IV: 3.7/1.5/3/4.35/2/14.55. Spination: tarsi without spines; leg I: femur d0-1-0-1-0-1, tibia r0-1-0-2-0-1ap, metatarsus v0-1-0-1ap; II: femur d0-1-0-1p, tibia d0-1-0, v0-1p-0-1r-1-0-3ap, metatarsus v0-2-0-1-0-1ap; III: femur d0-0-1-2, patella p-0-1, tibia d-1-0-1, v2-0-1-0-2ap, metatarsus v0-1-2-0-1-2-1p-0-3ap; IV: femur d0-0-0-1, tibia p0-1-0-1, v0-0-1-1-0-0-3ap, metatarsus d0-0-1, v0-1-1-0-1r-0-1-0-1-0-2-3ap. Scopulae on tibia and metatarsus absent; tarsi I-IV integral. STC without teeth on all claws. Tibia I with a megaspine on the retrolateral side (Figs. 57-58). Palpal bulb pyriform with curved embolus with thin keels (Figs. 53-56). Spinnerets: basal segment 0.3; median 0.25; apical 0.1.

Female (UFMG 12986). Coloration as in male (Fig. 62). Total length 9.6. Carapace 4.62 long, 3.66 wide. Fovea: 0.75, slightly procurved. Clypeus: 0.2. Eyes group rectangular, wider than long: 0.54 long, 0.72 wide. Anterior eyes row procurved and posterior slightly recurved. Eyes size and interdistances: AME 0.2, ALE 0.18, PME 0.1, PLE 0.18. ALE-ALE 0.53, ALE-



Figures 52-61. *Neodiplothele martinsi* sp. nov. (52-58) male (UFMG 12708): (52) habitus, dorsal view; (53-56) left male palpal bulb: (53) dorsal view; (54) ventral view; (55) prolateral view; (56) retrolateral view; (57-58) left tibia of the leg I: (57) ventral view; (58) retrolateral view; (59-61) female (UFMG 12707): (59) habitus, dorsal view; (60) spermathecae, dorsal view; female (UFMG 12986): (61) spermathecae, dorsal view. Scale bars: (52, 59) 2.0 mm, (57, 58) 1.0 mm, (53-56, 60, 61) 0.5 mm.



Figures 62-63. *Neodiplothele martinsi* sp. nov. from Estação Ecológica Mata de Acauã, Leme do Prado, Minas Gerais: (62) female, dorsal view (UFMG 12708); (63) male, dorsal view (UFMG 12986). Photos: Pedro H. Martins.

AME 0.05, AME-PME 0.04, PME-PME 0.45, PLE-PME 0.03, AME-AME 0.1, ALE-PLE 0.03. Labium: 0.38 long, 0.85 wide. Sternum: 2.3 long, 1.86 wide, sigillae not visible. Rastellum formed by 13 short conical spines on promargin. Endites with 6 cuspules each. Basal segment of chelicerae with a row of 9 prolateral teeth and a group of 12 smaller basal ones. Palp: femur 2.55/patella 1.3/tibia 1.5/cymbium 1.05/total 6.4; leg I: femur 3/patella 2.05/tibia 2/metatarsus 1.75/tarsus 1/total 9.8. II: 3.1/2/2.1/0.95/10.15; III: 2.5/1.75/1.9/2/1/9.15; IV: 3.8/2.25/3/3.75/1.45/14.25. Spination: tarsi without spines; palp: femur d0-0-1p, patella p0-1, tibia v0-1-0-1-0-1-2ap; leg I: femur d0-1-1-0-1p, tibia v0-1-0-1-0-1ap, metatarsus v2-0-0-1ap; II: femur d0-0-1p, patella p0-1, tibia r0-1-0-1-0-1ap, metatarsus v2-0-0-2ap; III: femur p0-0-1, patella p0-1-1, tibia p0-1, v0-1-0-1-0-2ap; metatarsus v0-2-0-2-1p-0-2ap; IV: femur p0-0-1, patella p0-1-1, tibia v0-2-0-2-0-2ap, metatarsus v0-2-0-2-1-1p-0-2-4ap. Scopulae on tibia I-II 3/4, III 1/4 and IV absent; metatarsi I-III integral and IV absent; tarsi I-IV integral. STC without



Figures 64-66. *Neodiplothele martinsi* sp. nov.: (64) Collection site in Estação Ecológica Mata de Acauã, Leme do Prado, Minas Gerais; (65) trapdoor camouflaged with debris and mosses; (66) female inside his burrow holding the trapdoor (UFMG 12986). Photos: Pedro H. Martins.

teeth on all claws. Spermathecae with a very large base of the seminal receptacles; the internal branch two times longer than the external and lobes globose (Figs. 60-61). Spinnerets: basal segment 0.75; median 0.4; apical 0.18.

Additional material examined. BRAZIL: *Bahia*: Porto Seguro (16°27'0"S, 39°3'54"W), 1 male, 29.VI.1970, Equipe Biota leg., (MNRJ 13809). *Espírito Santo*: Santa Teresa, Reserva Biológica Augusto Ruschi (19°56'09"S, 40°36'00"W), 1 male, 4.VII.2013, P.H. Martins & M.T.T. Santos leg. (UFMG 12983). *Minas Gerais*: Alto Caparaó (20°26'2"S, 41°52'4"W), 1 female, 1-7.V.2002, Equipe Biota leg. (IBSP 137672); Belo Horizonte, Parque Nacional das Mangabeiras (19°49'1"S, 43°57'W), 3 males, 4-12.XII.2008, H.H. Santos et al. leg. (UFMG 7879; UFMG 7959); Catas Altas, RPPN Serra da Caraça (20°4'30"S, 43°24'28"W), 2 males, 24-30.IV.2002, Equipe Biota leg. (IBSP 132230-132231); Januária, Parque Nacional Cavernas do Peruaçu (15°29'16"S, 44°21'43"W), 1 female, 10-31.VII.2008, M. Teixeira Jr. & R. Records leg. (IBSP 119903); Leme do Prado, Estação Ecológica Mata de Acauã (17°8'0.7"S, 42°46'51"W), 1 female and 15 juveniles, 18-28.II.2013, P.H. Martins leg., (UFMG 12707); Mariana, Gruta Furnas (20°22'40"S, 43°24'57"W), 3 juveniles, 10.IV.2002, F. Túlio leg. (IBSP 165125); Santana do Riacho, Parque Nacional da Serra do Cipó (19°15'S, 43°31'W), 1 male, 28. II-14.X.2002, Equipe Biota leg. (IBSP 13192); Ouro Preto, Estação Ecológica de Tripuí (20°23'8"S, 43°30'29"W), 1 male, Equipe Biota leg. (IBSP 165124).

Distribution. BRAZIL: states of Bahia, Espírito Santo and Minas Gerais (Fig. 92).

Etymology. The species is in honor of Pedro Henrique Martins, the collector of this species.

Variation. Males (n = 6) total length 5.7-7.5; carapace 2.88-3.96 long, 2.4-3.3 wide; femur I 2.64-3.48. Females (n = 4) total length 8.64-9.6; carapace 4.2-4.62 long, 3.3-3.86 wide; femur I 3-3.16.

Natural history. The species were collected in a small ravine of sandy soil located on the edge of a road (Fig. 64, arrow). The tubular burrow was covered by silk and protected by a malleable trapdoor very well camouflaged with debris and mosses (Figs. 65-66). The burrow had a circular shape with only one entrance. It was about 2-3 cm wide and 10-12 cm deep. Several exuviae were found next to the burrows and base of the ravine.

### The *picta* group

This group is characterized by the globose aspect of the palpal bulb with a very long and thin embolus with a curvature on the median region (Figs. 68-71, 76-79, 87-90). Female seminal receptacle with narrow base (Figs. 73, 81). Three species are included: *Neodiplothele picta*, *N. indicattii* sp. nov. and *N. caucaia* sp. nov.

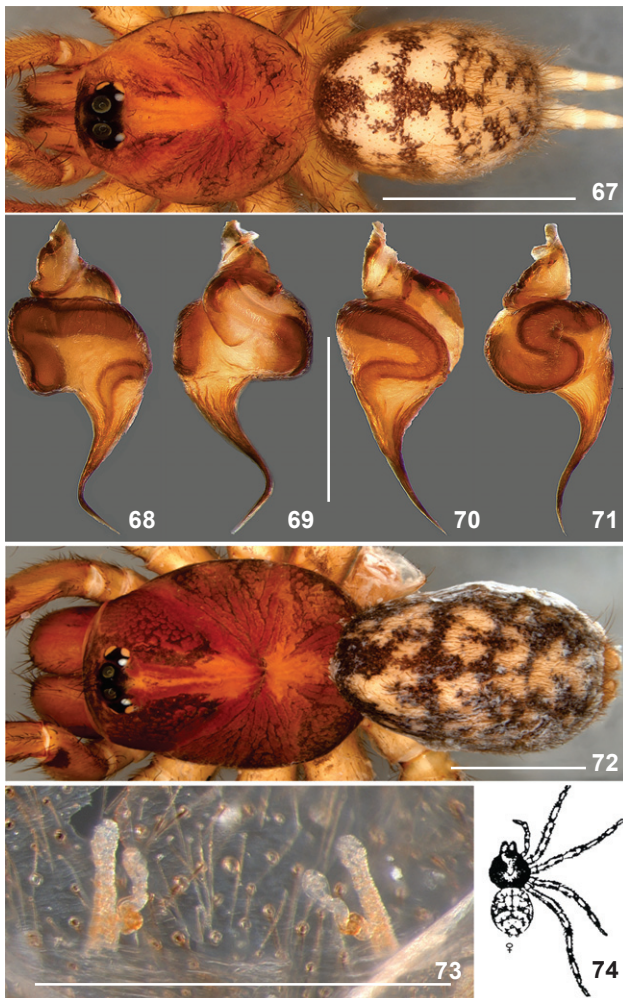
### *Neodiplothele picta* Vellard, 1924

Figs. 13, 67-74, 91

*Neodiplothele picta* Vellard, 1924: 149, PL 10, fig. 40 (female holotype from BRAZIL: *Rio de Janeiro*, Niterói, J. Vellard leg., should be in the Instituto Vital Brazil, Niterói, not localized, lost).

Diagnosis. *Neodiplothele picta* can be easily recognized by the color pattern of the dorsal area of the abdomen with light distinct spots (Figs. 67, 72, 74). Males of *N. picta* can be distinguished by the strong curvature on the median half of the embolus with slender keels (Figs. 13, 68-71). Females can be distinguished by the aspect of the seminal receptacle with the external branch without sinuosity (Fig. 73).

Description. Male (IBSP 13006). Coloration in ethanol: carapace light brown with a narrow strip centralized, extending from clypeus to the fovea; dorsal side of the abdomen with light spots. Femora, patella, tibia and metatarsus with two lateral black spots; spinnerets with lateral black spots on the basal segment (Fig. 67). Total length 6.08. Carapace 2.82 long, 2.7 wide. Fovea: 0.2, procurved. Clypeus: 0.25. Eyes group rectangular, wider than long: 0.48 long, 0.96 wide. Anterior eyes row procurved and posterior slightly recurved. Eyes size and interdistances: AME 0.25, ALE 0.21, PME 0.15, PLE 0.22. ALE-ALE 0.73, ALE-AME 0.1, AME-PME 0.08, PME-PME 0.45, PLE-PME 0.03, AME-AME 0.13, ALE-PLE 0.05. Labium: 0.23 long, 0.58 wide. Sternum: 1.67 long, 1.46 wide. Rastellum formed by 12 short conical spines on promargin. Endites with 3 cuspules each. Basal segment of chelicerae with row of 7 prolateral teeth and 10 smaller grouped basal ones. Palp: femur 1.1/patella 0.4/tibia 1.05/cymbium 0.5/



Figures 67-74. *Neodiplothele picta*. (67-71) male (IBSP 13006): (67) habitus, dorsal view; (68-71) left male palpal bulb: (68) dorsal view; (69) ventral view; (70) prolateral view; (71) retrolateral view; (72-74) female (UFMG 7577): (72) habitus, dorsal view; (73) spermthecae, dorsal view; (74) illustration of female by Vellard, 1924: 149, pl. 10, fig. 40a. Scale bars: (67, 72) 2.0 mm, (68-71, 73) 0.5 mm.

total 3.05; leg I: femur 2.7/patella 1.05/tibia 1.95/metatarsus 2.4/tarsus 1.15/total 9.25; II: 2.6/1.15/2.05/1.7/1.3/8.8; III: 2.65/0.8/2.1/2.05/1.2/8.8; IV: 3.4/1.15/2.8/2.65/1.3/11.3. Spination: tarsi without spines; leg I: femur v0-0-1ap, tibia v0-0-1-1-0-2ap; II: femur d0-0-1ap, tibia v0-0-1-1r-0-3ap, metatarsus v0-1p-1-0-0-1ap; III: femur d0-0-1ap, patella v0-1-0-2ap, metatarsus v0-1-0-1p, p0-1-0-3ap; IV: tibia v0-1-0-4ap, metatarsus d0-0-1, v0-1-0-3ap. Scopulae on tibia and metatarsus absent; tarsi I-IV integral. STC I with 3 teeth, II with 4, III-IV with 2. Palpal bulb globose with strong curvature of the embolus on the median half, with slender keels (Figs. 13, 68-71). Spinnerets: basal segment 0.58; median 0.38; apical 0.13.

Female (UFMG 7577). Coloration in ethanol as in male (Fig. 72). Total length 7.76. Carapace 4.0 long, 3.1 wide. Fovea: 0.6, slightly procurved. Clypeus: 0.3. Eyes group rectangular, wider than long: 0.45 long, 1.18 wide. Anterior eyes row procurved e posterior slightly recurved. Eyes size and interdistances: AME 0.18, ALE 0.25, PME 0.15, PLE 0.2. ALE-ALE 0.93, ALE-AME 0.09, AME-PME 0.12, PME-PME 0.63, PLE-PME 0.03, AME-AME 0.2, ALE-PLE 0.08. Labium: 0.4 long, 0.74 wide. Sternum: 2.4 long, 2.02 wide. Rastellum formed by 13 short conical spines on promargin. Endites with 10 cuspsules each. Basal segment of chelicerae with row of 10 prolateral teeth and 7 smaller grouped basal ones. Palp: femur 1.55/patella 1.2/tibia 1.15/cymbium 1.2/total 4.5; leg I: femur 2.6/patella 1.9/tibia 1.7/metatarsus 1.45/tarsus 0.95/total 8.6; II: 2.35/1.75/1.45/1.25/0.8/7.6; III: 2.1/1.55/1.4/1.35/0.85/7.25; IV: 3.05/1.85/2.15/2.4/1.05/10.5. Spination: tarsi without spines; Palp: patella p0-1ap, tibia v0-1r-2-1r-3ap; leg I: tibia r0-1-1-1-2ap; II: patella p0-1ap, tibia v0-1p-0, metatarsus r0-1-0-2ap; III: patella v0-1p, tibia v0-2-1p-2-0-3ap, metatarsus v0-1p-0-1r-4ap; IV: tibia v0-1-0-2ap, metatarsus v0-1-0-4ap. Scopulae on tibia I-II 2/3, III 1/4, IV absent; metatarsi I-III integral and metatarsus IV absent; tarsi I-IV integral. STC without teeth on all claws. Spermthecae with fili-form seminal receptacles with narrow base; the external branches elevated and the internal branches sinuous (Fig. 61). Spinnerets: basal segment 0.2; median 0.13; apical 0.05.

Additional material examined. BRAZIL: *Tocantins*: Palmas, Fazenda Sandoval (10°11'4"S, 48°20'1"W), 2 males, (IBSP 165135-165136). *Espírito Santo*: Cariacica, Reserva Biológica de Duas Bocas (20°15'50"S, 40°25'12"W), 1 male, IV.2013-I.2014, A.E.S. Alencar leg. (IBSP 166181); Domingos Martins, Mata Pico do Eldorado (20°21'46"S, 40°39'32"W), 2 males, 3.XII.2004, M.T. Tavares et al. leg. (IBSP 13006). *Minas Gerais*: Caratinga, RPPN Feliciano Miguel Abdala (19°47'24"S, 42°08'20"W), 1 female, 26-27. VI. 2008, I.S. Oliveira leg. (UFMG 7577).

Distribution. BRAZIL: states of Espírito Santo, Minas Gerais, Rio de Janeiro, and Tocantins (Fig. 91).

Remarks. The holotype is currently lost so the spermthecae could not be illustrated. VELLARD (1924) presented a very good illustration of the specimen's dorsal aspect with the characteristic color pattern showing the light spots on the abdomen and the light band on carapace, allowing to easily recognize this species (compare Figs. 67, 72, 74).

Variation. Males (n = 5) total length 5.52-7.6; carapace 4.5-4.7 long, 2.34-3.04 wide; femur I 2.16-3.68.

### *Neodiplothele indicattii* sp. nov.

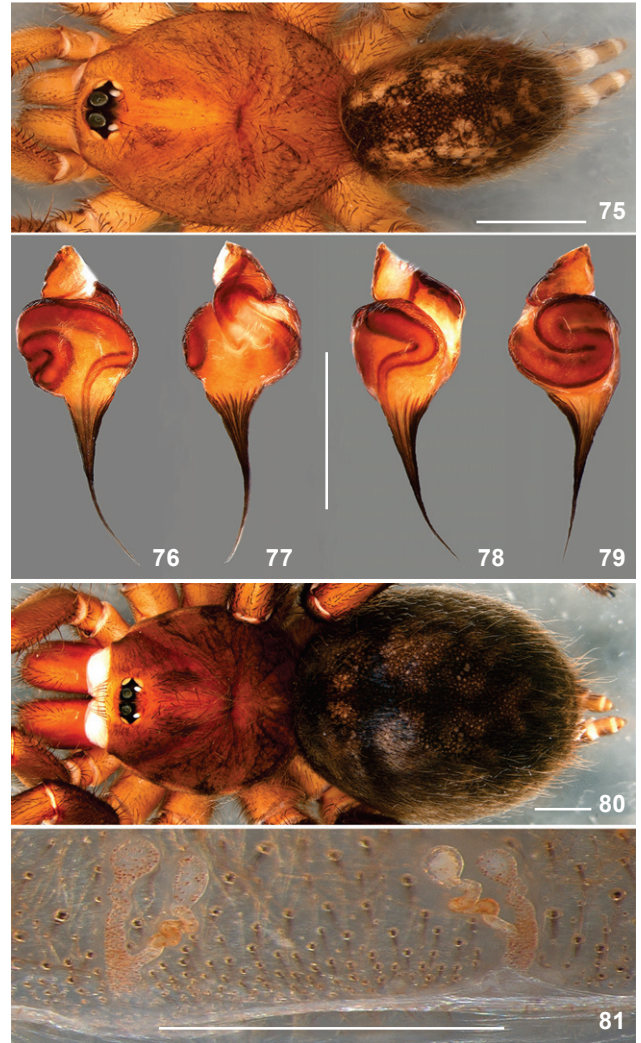
Figs. 6, 11, 75-85, 92

Type material. Male holotype from BRAZIL: *Rio de Janeiro*, Teresópolis, Parque Nacional da Serra dos Órgãos, 22°27'07"S, 42°59'26"W, 18-31.XII.2011, R.P. Indicatti & B. Gambaré leg., deposited in IBSP 165129. Paratypes: 2 females, with same data of holotype, deposited in IBSP 165132, IBSP 165133 and 1 male and 1 female, with same locality of holotype, deposited in MNRJ 4530.

Diagnosis. Males of *Neodiplothele indicattii* **nov. sp.** can be distinguished by the slight curvature of the embolus (Figs. 76-79). Female can be distinguished by the aspect of the spermathecae with the sinuous external branch it near the apex (Fig. 81).

Description. Male (IBSP 165129). Coloration in ethanol: carapace light brown; on the both side of the abdomen dark brown with light spots (Fig. 75). Femora, patella, tibia and metatarsus with two lateral black spots (Fig. 75). Coloration in vivo: general aspect brown, covered with reddish-yellow setae; spots on the abdomen not evident (Fig. 83). Total length 8.16. Carapace 4.56 long, 4.02 wide. Fovea: 0.58, slightly procurved. Clypeus: 0.23. Eyes group rectangular, wider than long: 0.59 long, 1.21 wide. Anterior eyes row procurved e posterior slightly recurved. Eyes size and interdistances: AME 0.3, ALE 0.3, PME 0.18, PLE 0.25. ALE-ALE 0.85, ALE-AME 0.03, AME-PME 0.08, PME-PME 0.6, PLE-PME 0.03, AME-AME 0.2, ALE-PLE 0.05. Labium: 0.28 long, 0.78 wide. Sternum: 2.2 long, 2.07 wide. Rastellum formed by 6 short conical spines on promargin. Endites with 8 cuspules each. Basal segment of chelicerae with row of 9 prolateral teeth and 11 smaller grouped basal ones. Palp: femur 1.95/patella 1.6/tibia 1.45/cymbium 0.6/total 5.6; leg I: femur 4.25/patella 2.7/tibia 3.15/metatarsus 3.25/tarsus 1.85/total 15.2; II: 3.75/2.4/3.1/2.7/1.65/13.6; III: 3.65/2.1/2.85/3.2/1.6/13.4; IV: 3.95/2.5/3.9/4.25/2.05/16.65. Spination: tarsi without spines; leg I: tibia v0-0-1p-1-0-1ap; II: tibia d0-1-0, metatarsus d0-1-0, v0-1-0; III: tibia p0-1-0-3ap, metatarsus v0-1-1-0-1, d0-1-0-3ap; IV: metatarsus p0-1-0-1ap, r0-1-0-2ap. Scopulae on tibia and metatarsus absent; tarsi I-II integral and III-IV divided by one narrow row of thin setae. STC I-II with 4, III with 3, IV with 5. Palpal bulb with long and thin embolus (Figs. 76-79). Spinnerets: basal segment 0.8; median 0.73; apical 0.23.

Female (IBSP 165132). Coloration in ethanol as in male (Fig. 80). Coloration in vivo: general aspect dark brown; dorsal side of the abdomen with light brown spots (Figs. 82, 85). Total length 15.4. Carapace 7.2 long, 6.1 wide. Fovea: 0.9, slightly procurved. Clypeus: 0.37. Eyes group rectangular, wider than long: 0.81 long, 1.55 wide. Anterior eyes row procurved e posterior slightly recurved. Eyes size and interdistances: AME 0.23, ALE 0.33, PME 0.15, PLE 0.3. ALE-ALE 1.0, ALE-AME 0.1, AME-PME 0.15, PME-PME 0.75, PLE-PME 0.05, AME-AME 0.25, ALE-PLE 0.1. Labium: 0.85 long, 1.35 wide. Sternum: 3.82 long, 3.1 wide. Rastellum formed by 15 short conical spines on promargin. Endites with 10 cuspules each. Basal segment of chelicerae with row of 11 prolateral teeth and 9 smaller grouped basal ones. Palp: femur 3.3/patella 2.4/tibia 1.92/cymbium 1.56/total 9.18; leg I: femur 4.5/patella 3.6/tibia 3.06/metatarsus 2.52/tarsus 1.74/total 15.42; II: 4.26/3.18/2.82/2.46/1.44/14.16; III: 4.2/2.76/2.15/2.82/1.5/13.43; IV: 4.14/3.24/4.2/4.32/1.74/17.64. Spination: tarsi without spines. Palp: patella v-0-1-0, tibia r1-0-1-1ap; leg II: patella v2-0, tibia r0-1-0-1ap; III: metatarsus v0-2-0-3ap; IV: metatarsus p0-1-0-3ap. Scopulae on tibia I-II 3/



Figures 75-81. *Neodiplothele indicattii* **sp. nov.** (75-79) male (IBSP 165129): (75) habitus, dorsal view; (76-79) left male palpal bulb: (76) dorsal view; (77) ventral view; (78) prolateral view; (79) retrolateral view; (80-81) female (IBSP 165132): (80) habitus, dorsal view; (81) spermathecae, dorsal view. Scale bars: (75, 80) 2.0 mm, (76-79, 81) 0.5 mm.

4, III 2/3 and IV absent; metatarsi I-III integral and IV absent; tarsi I-III integral and IV divided by one narrow row of thin setae. STC without teeth on all claws. Spermathecae with seminal receptacles narrowed at base; internal branch very coiled and the external with a slight curvature near the apex (Fig. 81). Spinnerets: basal segment 0.88; median 0.25; apical 0.1.

Additional material examined. BRAZIL: *Espírito Santo*: Cariacica, Reserva Biológica de Duas Bocas (20°15'50"S, 40°25'12"W), 3 males, IV.2013-I.2014, A.E.S. Alencar leg. (IBSP 166182-166184); Santa Teresa, (19°56'09"S, 40°36'00"W), 1 male,



Figures 82-85. *Neodiplothele indicattii* sp. nov., from Parque Nacional Serra dos Órgãos, Teresópolis, Rio de Janeiro: (82) female, dorsal view (IBSP 165132); (83) male, dorsal view (IBSP 165129); (84) female inside her burrow lurking (IBSP 165132); (85) female in her burrow without the doors (IBSP 165132). Photos: Rafael P. Indicatti.

X.2005, T. Souza et al. leg. (IBSP 12322). *Minas Gerais*: Itamonte, Parque Nacional do Itatiaia (22°22'6.923"S, 44°44'43.50"W), 2 females, 26-31.XII.2013, R.P. Indicatti & B. Gambaré leg., (IBSP 165134, IBSP 166761). *Rio de Janeiro*: Teresópolis, Parque Nacional da Serra dos Órgãos (22°27'07"S, 42°59'26"W), 2 females, 18-31.XII.2011. R.P. Indicatti & B. Gambaré leg. (IBSP 165130-165131), 1 female, 25.I.1996, R.L.C.Barbosa leg. (MNRJ 6808). *São Paulo*: Cruzeiro, (Pico dos Martins, Serra da Mantiqueira, 22°29'54"S, 45°7'11"W), 1 female, XII.2013, H. Thomassen leg. (UFMG 14832); Salesópolis, Estação Ecológica de Boracéia (23°31'55"S, 45°50'45"W), 1 male and 2 females, VII.2005, A.D. Brescovit et al. leg. (IBSP 165126-165128).

Distribution. BRAZIL: states of Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo (Fig. 76).

Etymology. The species is in honor of the arachnologist Rafael Prezzi Indicatti, the collector of this species.

Variation. Males (n = 5) total length 4.16-8.16; carapace 2.24-4.56 long, 2.08-4.2 wide; femur I 2.24-4.25. Females (n = 6) total length 13.13-15.4; carapace 5.7-7.38 long, 5.1-7.12 wide; femur I 3.6-4.5.

Natural history. These specimens were collected manually in the Atlantic Forest (Parque Nacional da Serra dos Órgãos, Teresópolis, Rio de Janeiro and Parque Nacional do Itatiaia, Itamonte, Minas Gerais) at high altitudes (between 1000-2000 m). They build their burrows near the trees, roots and fallen trunks in ravines covered with vegetation. The ravines are on

the trails edge and are about one meter above the ground level, as well as in *N. martinsi* sp. nov. The burrow has a canoe shape with two trapdoors camouflaged with mosses and each trapdoor is 2 cm wide (Figs. 84-85). Females were found at night, lurking in their burrows waiting for their prey with their legs out of the trapdoor (Fig. 85), and the male was found walking on the ground on the tracks edges at night.

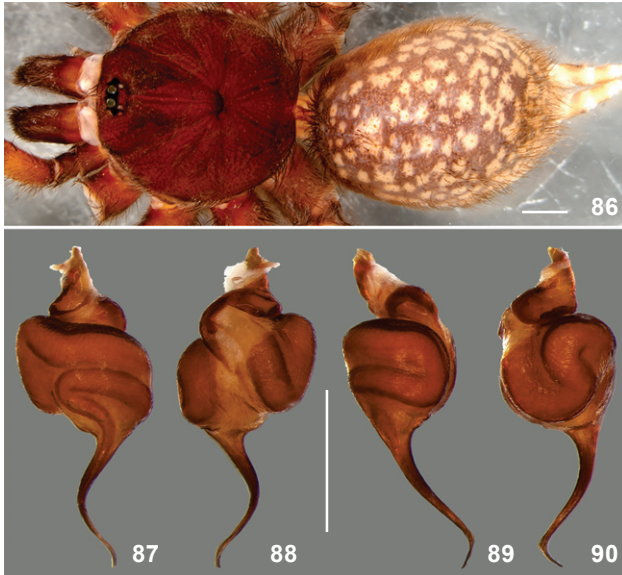
### *Neodiplothele caucaia* sp. nov.

Figs. 86-90, 92

Type material. Male holotype from BRAZIL: *Ceará*, Caucaia, (03°43'58"S, 38°39'21"W), III.2007, G. Pessoa leg., deposited in IBSP 123506. Paratype: 1 male from BRAZIL: *Goiás*, Jataí, (Pontal do Urutau, 17°52'51"S, 51°42'50"W), 1952, Prefeitura Municipal leg., deposited in IBSP 13720.

Diagnosis. Males of *Neodiplothele caucaia* sp. nov. can be distinguished by the aspect of the palpal bulb with an embolus with a strong curvature in the median area, curved tip and inconspicuous keels (Figs. 87-90).

Description. Male (IBSP 123506). Coloration in ethanol: carapace brown; abdomen brown with light spots; spinnerets with lateral black spots on the basal segment; femora more dark than other segments (Fig. 86). Total length 12.4. Carapace 5.34 long, 4.8 wide. Fovea: 0.8, procurved. Clypeus: 0.15. Eyes group rectangular, wider than long: 0.82 long, 0.9 wide. Eyes size and interdistances: AME 0.3, ALE 0.25, PME 0.18, PLE 0.25. ALE-



Figures 86-90. *Neodiplothele caucaia* sp. nov.: male (IBSP 123506): (86) habitus, dorsal view; (87-90) left male palpal bulb: (87) dorsal view; (88) ventral view; (89) prolateral view; (90) retrolateral view; Scale bars: (86) 2.0 mm; (87-90) 0.5 mm.

ALE 0.68, ALE-AME 0.05, AME-PME 0.1, PME-PME 0.48, PLE-PME 0.03, AME-AME 0.15, ALE-PLE 0.1. Labium: 0.38 long, 0.88 wide. Sternum: 2.85 long, 2.38 wide. Rastellum formed by 15 short conical spines on promargin. Endites with 3 cuspsules each. Basal segment of chelicerae with row of 7 prolateral teeth and of 9 smaller grouped basal ones. Palp: femur 2.65/patella 1.7/tibia 2/cymbium 1/total 7.35; leg I: femur 4.5/patella 2.55/tibia 3/metatarsus 3.2/tarsus 2/total 15.25; II: 4.25/2.45/2.95/3.5/1.9/15.05; III: 3.9/2.5/3/4/2.1/15.5; IV: 5.5/2.85/4.5/6.25/2.5/21.6. Spination: tarsi without spines; palp: tibia p0-1ap; leg I: femur d0-1-0-1-0-2, patella p0-0-1, tibia v1-1-1p-0-2-1r-0-1p-0-2ap, metatarsus p0-1-0-1, v0-0-1-1-0-0-1-1ap; II: femur d0-1-0-1-0-2, patella p0-0-1, tibia p1-0-1-0-1, v1-0-1-0-0-1-1-0-0-3ap, metatarsus v0-0-1-1p-1-1r-0-0-1p-1r-2ap; III: femur d0-1-0-2-0-1, patella p0-1-0-1-0, tibia p0-1-0-1-0, r1-0-1-0-0-1, v0-2-0-2-0-2ap, metatarsus p0-1-0-1-0-1-0-1, v0-1-1-0-1r-0-0-1-1-0-3ap; IV: femur d0-1-0-1-0, patella p0-1-1-0, tibia v2-0-1p-1-0-0-1p-1r-0-3ap, metatarsus v0-1p-0-1p-0-1r-0-1-0-1-0-0-1-1p-1-0-3ap. Scopulae on tibia and metatarsus absent, tarsi I-II integral and III-IV divided by one narrow row of thin setae. STC I-II with 1 teeth, II-III with 2. Palpal bulb with long embolus, spermatic duct strongly curved distally, base of embolus enlarged (Figs. 87-90). Spinnerets: basal segment 0.88; median 0.5; apical 0.25.

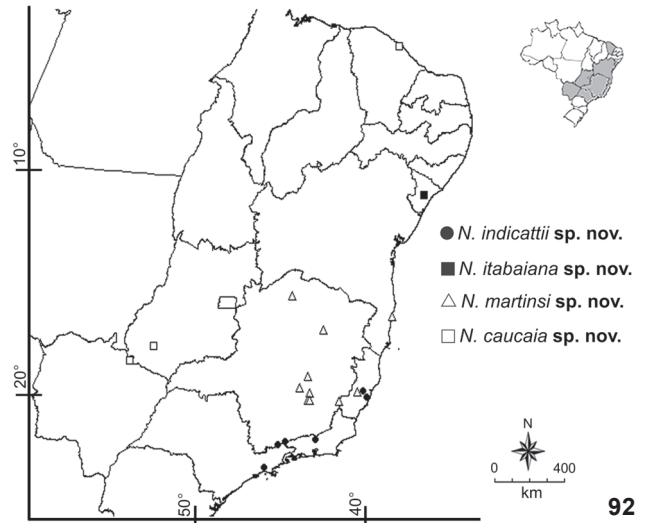
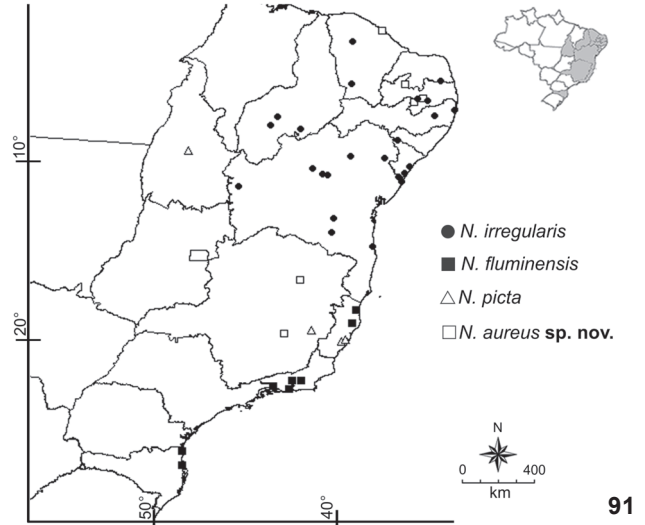
Female. Unknown.

Distribution. BRAZIL: states of Ceará, Goiás, and Mato Grosso do Sul (Fig. 92).

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

Variation. Males (n = 2) total length 10:4-12.4; carapace 5.3-6 long, 4.8-5.1 wide; femur I 3.6-4.5.

Additional material examined. BRAZIL: *Mato Grosso do Sul*: Costa Rica, Fazenda Santo Antônio (18°31'38"S, 52°57'42"W), 1 male, 24-27.X.2000, E. Fechara leg. (MZUSP 59999).



Figures 91-92. Distribution map of species of *Neodiplothele*.

### Identification key to *Neodiplothele* species

#### Males

1. Male palpal bulb pyriform ..... 2
- 1'. Male palpal bulb globose ..... 6
2. Tibia I with megaspine (Figs. 31-32, 47-48, 57-58) ..... 3
- 2'. Tibia I without megaspine (Figs. 22-23) ..... 5

3. One megaspine on retrolateral side (Figs. 47-48, 57-58) .. 4  
 3'. Two megaspines on the prolateral side (Fig. 31-32) .....  
 ..... *N. fluminensis*  
 4. Spermatic duct with curvature on prolateral view (Fig. 55)....  
 ..... *N. martinsi* **sp. nov.**  
 4'. Spermatic duct without curvature on prolateral view (Figs.  
 45) ..... *N. itabaiana* **sp. nov.**  
 5. Embolus with several evident keels on ventral side and a  
 sinuous distal area (Figs. 35-38) ..... *N. aureus* **sp. nov.**  
 5'. Embolus with around 7 keels on ventral side and slight  
 curvature on the tip (Figs. 18-21) ..... *N. irregularis*  
 6. Strong curvature of the embolus on the median half (Figs.  
 68-71, 87-90) ..... 7  
 6'. Light curvature in the embolus (Figs. 76-79) .....  
 ..... *N. indicattii* **sp. nov.**  
 7. Slender keels on embolus (Figs. 68-71) ..... *N. picta*  
 7'. Inconspicuous keels on embolus (Figs. 87-90) .....  
 ..... *N. caucaia* **sp. nov.**

## Females

Female of *N. fluminensis* and *N. caucaia* **sp. nov.** are unknown

1. Dorsal aspect color golden (Fig. 41) ..... *N. aureus* **sp. nov.**  
 1'. Dorsal aspect color brown (Figs. 62-63, 82-83) ..... 2  
 2. Seminal receptacle with large base (Figs. 25, 40, 50-51, 60-  
 61) ..... 3  
 2'. Seminal receptacle with narrow base (Figs. 73, 81) ..... 4  
 3. Internal branch with filiform lobes (Figs. 50-51) .....  
 ..... *N. itabaiana* **sp. nov.**  
 3'. Internal branch with globose lobes (Figs. 60-61) .....  
 ..... *N. martinsi* **sp. nov.**  
 4. External branches with sinuosity (Fig. 81) .....  
 ..... *N. indicattii* **sp. nov.**  
 4'. External branches without sinuosity (Fig. 73) ..... *N. picta*

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## LITERATURE CITED

- BERTANI R (2001) Revision Cladistic analysis and zoogeography of *Vitalius*, *Nhandu*, and *Proshapalopus*; with notes on other theraphosid genera (Araneae, Theraphosidae). **Arquivos de Zoologia** 36: 265-356.  
 BÜCHERL WA, TIMOTHEO DA COSTA A, LUCAS SM (1971) Revisão de alguns tipos de aranhas caranguejeiras (Orthognatha) estabelecidos por Candido de Mello-Leitão e depositados no Museu Nacional do Rio de Janeiro. **Memórias do Instituto Butantan** 35: 117-138.  
 GOLOBOFF PA (1995) A revision of the South American spiders of the family Nemesiidae (Araneae, Mygalomorphae). Part I: species from Peru, Chile, Argentina, and Uruguay. **Bulletin American Museum of Natural History** 224: 1-189.  
 MELLO-LEITÃO CF (1917) Notas arachnológicas. 5 espécies novas ou pouco conhecidas do Brazil. **Broteria** 15: 74-102.  
 MELLO-LEITÃO CF (1923) Theraphosideas do Brazil. **Revista Museu Paulista** 13: 108-111.  
 MELLO-LEITÃO C F (1924) Quelques arachnides nouveaux du Bresil. **Extrait des annales de la société entomologique de France** 93: 179-187.  
 MELLO-LEITÃO CF (1926) Algumas theraphosoides novas no Brazil. **Revista Museu Paulista** 14: 307-324.  
 MELLO-LEITÃO CF (1939) Algunos arácnidos de Sudamérica. **Revista chilena de Historia Natural** 43: 169-176.  
 MELLO-LEITÃO CF (1943) Araneologica varia brasiliana. **Anais da Academia Brasileira de Ciências** 15: 255-265.  
 PETRUNKEVITCH A (1925) Arachnida from Panama. **Transactions of the Connecticut Academy of Arts and Sciences** 27: 51-248.  
 RAVEN RJ (1985) The spider infraorder Mygalomorphae (Araneae): cladistics and systematic. **Bulletin American Museum of Natural History** 182: 1-180.  
 RAVEN RJ (1986) A revision of the spiders genus *Sason* Simon (Sasoninae, Barychelidae, Mygalomorphae) and its historical biogeography. **Journal of Arachnology** 14: 47-70.  
 VELLARD J (1924) Etudes de zoologie. **Archivos Instituto Vital Brazil** 2: 1-32, 121-170.  
 WORLD SPIDER CATALOG (2015) **World spider catalog**. Bern, Natural History Museum Bern, version 15.5, available online at: <http://wsc.nmbe.ch> [Accessed: 4/4/2015]

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