

# Revision and cladistic analysis of *Isoctenus* and description of a new neotropical genus (Araneae, Ctenidae, Cteninae)

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A cladistic analysis was applied to test the monophyly of the genus *Isoctenus*. The data matrix comprised 28 taxa scored for 53 morphological and two behavioural characters. The analysis resulted in two equally parsimonious trees of 89 steps. The strict consensus was used to discuss the relationships of *Isoctenus* and related Cteninae genera. *Ctenopsis* Schmidt is synonymized with *Isoctenus*. *Isoctenus foliifer* Bertkau, *I. strandi* Mello-Leitão, *I. eupalaestrus* Mello-Leitão, *I. janeirus* (Walckenaer), *I. coxalis* (Pickard-Cambridge), *I. corymbus* Polotow, Brescovit & Pellegatti-Franco and *I. malabaricus* Polotow, Brescovit & Ott are maintained in *Isoctenus*. Four species currently included in *Ctenus* are transferred to *Isoctenus*: *I. griseolus* (Mello-Leitão) comb. nov., *I. taperae* (Mello-Leitão) comb. nov., *I. herteli* (Mello-Leitão) comb. nov. and *I. minusculus* (Keyserling) comb. nov. The following specific names are synonymized: *Ctenus sanguineus* Walckenaer, *C. semiornatus* Mello-Leitão and *Ctenopsis stellata* Schmidt with *Isoctenus janeirus* (Walckenaer), *Ctenus mourei* Mello-Leitão with *Isoctenus herteli* (Mello-Leitão) and *Ctenus pauper* Mello-Leitão with *Isoctenus strandi* Mello-Leitão. *Isoctenus sigma* Schenkel, described from French Guiana, is transferred to *Ctenus*. Four species are newly described: ***Isoctenus areia* sp. nov.** from Paraíba, Brazil, ***I. charada* sp. nov.** and ***I. segredo* sp. nov.** from Paraná, Brazil, and ***I. ordinario* sp. nov.** from south and south-eastern Brazil and north-eastern Argentina. *Isoctenus latevittatus* Caporiacco is considered *species inquirenda*. ***Parabatinga* gen. nov.** is proposed to include *Ctenus brevipes* Keyserling. The following synonymies are established: *Ctenus taeniatus* Keyserling, *C. tatarandensis* Tullgren, *C. anisitsi* Strand, *C. atrivulvus* Strand, *C. mentor* Strand, *C. brevipes brevilabris* Strand, *Isoctenus masculus* Mello-Leitão and *Ctenus birabeni* Mello-Leitão with *Parabatinga brevipes* (Keyserling) comb. nov. © 2009 The Linnean Society of London, *Zoological Journal of the Linnean Society*, 2009, 155, 583–614.

ADDITIONAL KEYWORDS: morphology – phylogeny – spiders – systematics – taxonomy.

## INTRODUCTION

*Isoctenus* was proposed by Bertkau (1880) to include an immature female collected in Rio de Janeiro, Brazil, and named *I. foliiferus*. Bertkau (1880) listed as diagnostic characters for *Isoctenus* species the short labium, leg IV longer than the others, short spinnerets and reddish coloration with a longitudinal lighter band with indented border on abdomen dorsum, to distinguish them from *Ctenus* Walckenaer.

The type specimen of *I. foliiferus*, as with all other type specimens of species described by Bertkau, was not found in any European museum and is probably lost (Levi, 1991). Later, Keyserling (1891) synonymized *Isoctenus* with *Ctenus*. Mello-Leitão (1936) listed *Isoctenus* as an independent genus. Bonnet (1957) corrected the orthography of the name *I. foliiferus* to *I. foliifer*. Lehtinen (1967) considered *Isoctenus* as an independent genus and removed it from synonymy of *Ctenus*. Currently, ten species are described in this genus (Polotow, Brescovit & Ott, 2007; Platnick, 2008).

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Several authors related *Isoctenus* to the subfamily Cteninae (Mello-Leitão, 1936; Lehtinen, 1967; Simó & Brescovit, 2001; Silva, 2003; Polotow, Brescovit & Pellegatti-Franco, 2005), based on the presence of five ventral pairs of tibial spines, female tibiae and metatarsi lacking lateral spines, and details of male pedipalp and female epigynum. Recent cladistic analysis related *Isoctenus* with some species of *Ctenus*, such as *C. taeniatus* Keyserling (Simó & Brescovit, 2001), *C. longipes* Keyserling (Simó & Brescovit, 2001) and *C. villasboasi* Mello-Leitão (Silva, 2003).

In the present paper, a cladistic analysis of *Isoctenus* using parsimony is presented and the relationships between *Isoctenus* and related Cteninae genera are discussed. *Isoctenus* is revised and its species redescribed, except *Isoctenus latevittatus* Caporiacco. A neotype is proposed for *Isoctenus foliifer* based on characters described in the original description. Based on the results of the cladistic analysis, a new monotypic Neotropical genus is proposed.

## MATERIAL AND METHODS

### CLADISTIC ANALYSIS

A total of 28 terminals (Appendix S1) comprised the taxonomic sample used in the cladistic analysis. The ingroup included all species currently allocated in *Isoctenus* (Platnick, 2008), except *Isoctenus latevittatus* Caporiacco from French Guiana.

Four genera comprising seven species assigned to Cteninae were included to test the monophyly of *Isoctenus* and search for its sister group (*Ctenus*, *Ctenopsis*, *Phoneutria* and *Centroctenus*). Three species assigned to Acantheinae were included: *Enoploctenus cyclothorax* (Bertkau), *Africactenus evadens* Steyn & Jocqué and *Petaloctenus bossema* Jocqué & Steyn. *Ancylometes concolor* (Perty), recently transferred from Pisauridae to Ctenidae (Silva, 2003), was used to root the trees, based on the recent cladistic hypothesis presented by Silva (2003). The data matrix (Appendix S2) comprised 55 characters (Appendix S1).

Nexus Data Editor, version 0.5.0 (Page, 2001), was used to edit the data matrix, which was submitted to a cladistic analysis using parsimony (Farris, 1983). Non-applicable and unknown data are presented as ‘-’ and ‘?’, respectively. All characters were equally weighted and all multistate characters were coded as non-additive (Fitch, 1971; Swofford & Maddison, 1987). Searches for the most parsimonious trees were carried out with PAUP\*, version 4.0b10 (Swofford, 2001), using the branch and bound algorithm (command ‘bandb’) and default settings of the program. Transformations states were considered synapomorphies for a node only if non-ambiguous and present in all resulting trees.

Branch support is expressed by Bremer support values (Bremer, 1994). The numbers in the circles in each node of Figures 1 and 2 represent Bremer Support values.

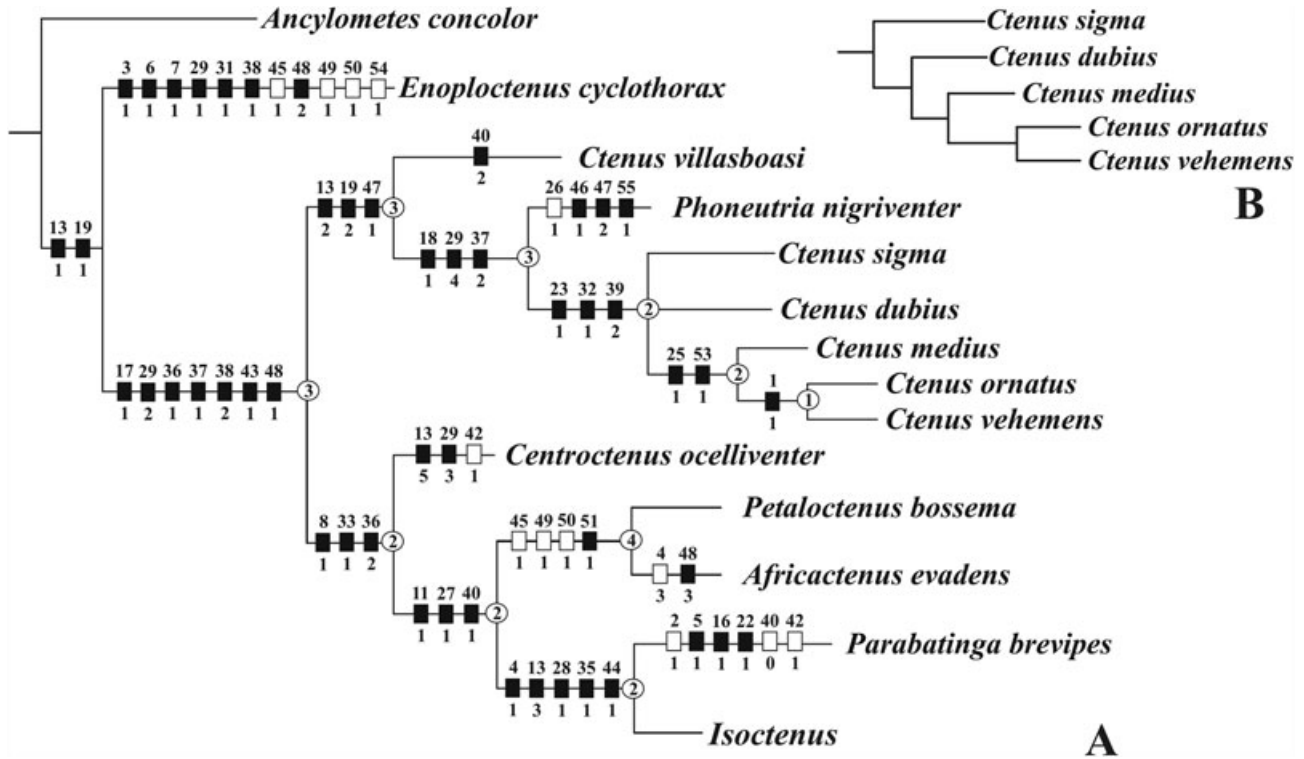
### MORPHOLOGICAL EXAMINATIONS

Morphological observations and illustrations were made using a Leica MZ12 stereomicroscope with a camera lucida. Digital SEM photographs were taken on a JEOL (JSM 840A) scanning electron microscope from the Laboratório de Microscopia Eletrônica, Departamento de Física Geral, Instituto de Física, Universidade de São Paulo. All measurements reported are in millimetres. Terminology follows, in part, Silva (2003).

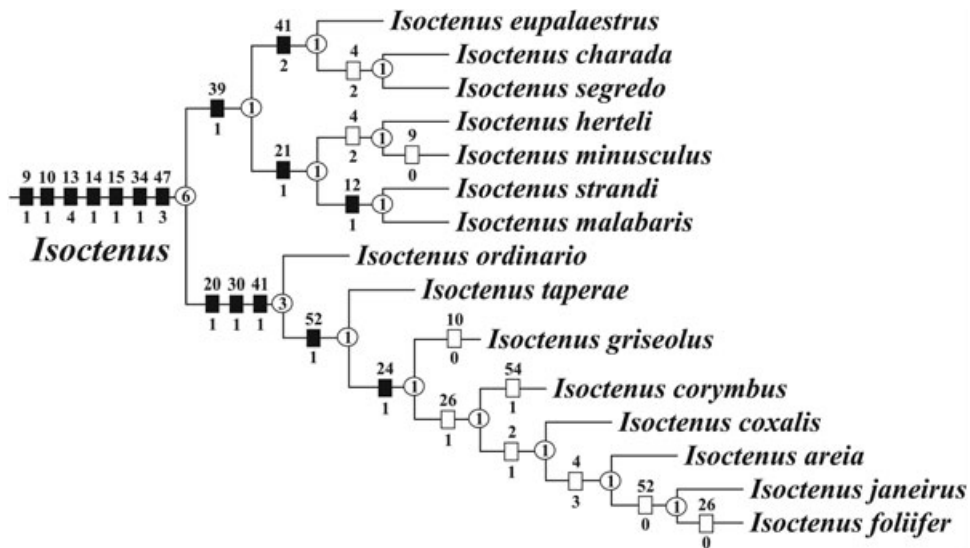
### ABBREVIATIONS

*Abbreviations:* ALE, anterior lateral eyes; AME, anterior median eyes; ap, anterior projection of median apophysis; bpe, basal prolateral projection of embolus; bre, basal retrolateral projection of embolus; BS, Bremer support; c, conductor; CI, consistency index; cp, copulatory pockets; d, dorsal; dbr, dorsal branch of RTA; drp, dorsal retrolateral projection of cymbium; e, embolus; iw, internal wall; lf, lateral field; lp, laminar projection of median apophysis; ls, lateral spurs; ma, median apophysis; mf, median field; mtp, membranous tegular projection; p, prolateral; PLE, posterior lateral eyes; PME, posterior median eyes; pp, posterior projection of median apophysis; ptd, prolateral tegular depression to accommodate the embolus; r, retrolateral; RC, rescaled consistency index; RI, retention index; rta, retrolateral tibial apophysis; s, spermathecae; stc, sclerotized tegular projection of conductor base; stp, subtegulum projection; v, ventral; va, ventral tibial apophysis; vbr, ventral branch of RTA; vfc, ventrobasal fold of cymbium; vrp, ventral retrolateral projection of cymbium; vw, ventral wall.

*Abbreviations:* BMNH, The Natural History Museum of London, London (J. Beccaloni); CAS, California Academy of Sciences, San Francisco (C. Griswold); CBF, Colección Boliviana de Fauna, La Paz (R. Altamirano); IBSP, Instituto Butantan, São Paulo (A. D. Brescovit); IRSN, Institut Royal de Sciences Naturelles de Belgique, Bruxelles (L. Baert); MACN, Museo Argentino de Ciencias Naturales ‘Bernardino Rivadavia’, Buenos Aires (C. Scioscia); MCN, Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre (E. H. Buckup); MCTP, Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre (A. A. Lise); MCZ, Museum of Comparative Zoology, Harvard University, Cambridge (G. Giribet; L.



**Figure 1.** A, consensus tree showing the relationships of the outgroup. Unambiguous character optimizations are represented by rectangles. White and black rectangles represent, respectively, homoplasious and non-homoplasious transformations. Bremer support values are represented by numbers in circles at the base of each node. B, the other equally parsimonious tree showing a solution to the polytomy among *Ctenus dubius*, *Ctenus sigma* and a clade formed by *Ctenus medius*, *Ctenus ornatus* and *Ctenus vehemens*.



**Figure 2.** Consensus tree showing the relationships of *Isoctenus*. Unambiguous character optimizations are represented by rectangles. The white and black rectangles represent, respectively, homoplasious and non-homoplasious transformations. Bremer support values are represented by numbers in circles at the base of each node.

Leibensperger); MHCI, Museu de História Natural 'Capão do Imbuia', Curitiba (J. C. de Moura-Leite); MLP, Museo de La Plata, La Plata (L. A. Pereira); MNHN, Muséum National d'Histoire Naturelle, Paris (C. Rollard); MNRJ, Museu Nacional do Rio de Janeiro, Rio de Janeiro (A. B. Kury); MRCA, Museum Royal for Central Africa, Tervuren (R. Jocqué); MZSP, Museu de Zoologia, Universidade de São Paulo, São Paulo (R. Pinto da Rocha); NMB, Naturhistorischen Museum Basel, Basel (A. Hänggi); SMF, Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main (P. Jäger); SMNH, Swedish Museum of Natural History, Stockholm (T. Kronstedt); SMNK, Staatliches Museum für Naturkunde Karlsruhe, Karlsruhe (H. Höfer); UBTU, Universidade Estadual Paulista, Botucatu (I. Rinaldi); ZMB, Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin (J. Dunlop).

## RESULTS

The cladistic analysis of 28 taxa and 55 characters resulted in two equally parsimonious trees of 89 steps (CI = 0.8427; CI, for informative characters = 0.8133; RI = 0.9466; RC = 0.7977). The difference between the two resulting trees is the different position of *Ctenus dubius*. In one of the trees, there is a polytomy among *Ctenus dubius*, *Ctenus sigma* and a clade formed by *Ctenus medius*, *C. ornatus* and *C. vehemens* (Fig. 1A). In the other resulting tree, the polytomy is solved and *Ctenus dubius* appears as the sister-group of the clade formed by *Ctenus medius*, *C. ornatus* and *C. vehemens* (Fig. 1B). However, the topology presented in Figure 1B is not supported by the data due to missing entries in the data matrix, although not been denied by it (Coddington & Scharff, 1994).

The strict consensus was calculated and is equal to the resulting tree described in Figures 1A and 2. The tree resulting from the strict consensus (Figs 1A, 2) is chosen for purposes of classification and taxonomy as described below.

*Enoploctenus cyclothorax* arises at the base of the resulting trees, as a representative of Acantheinae. *Africactenus* and *Petaloctenus* are both currently considered members of Acantheinae but in this analysis *A. evadens* and *P. bossema* arise among the Cteninae species and distant from *Enoploctenus cyclothorax*. The relationships of those genera with the Cteninae genera have to be explored in future studies, including the remaining Ctenidae genera.

*Ctenus* is a large and worldwide distributed genus (Platnick, 2008), suggested as non-monophyletic by several authors (Lehtinen, 1967; Höfer, Brescovit & Gasnier, 1994; Simó & Brescovit, 2001; Silva, 2003). The results of this analysis confirm the polyphyly of

*Ctenus* and suggest that the genus is a group of species closely related to *Phoneutria* Perty.

*Isoctenus* appears as a polyphyletic group as currently delimited. *Isoctenus foliifer* Bertkau, *I. strandi* Mello-Leitão, *I. eupalaestrus* Mello-Leitão, *I. janeirus* (Walckenaer), *I. coxalis* (Pickard-Cambridge), *I. corymbus* Polotow, Brescovit & Pellegatti-Franco and *I. malabaris* Polotow, Brescovit & Ott are indeed representatives of this genus. Four species currently described in *Ctenus* are transferred to *Isoctenus*: *C. griseolus* Mello-Leitão, *C. taperae* Mello-Leitão, *C. herteli* Mello-Leitão and *C. minusculus* Keyserling. Four species arise within *Isoctenus* and are newly described: *Isoctenus areia* sp. nov. from Paraíba, Brazil, *I. charada* sp. nov. and *I. segredo* sp. nov. from Paraná, Brazil, and *I. ordinario* sp. nov. from south and south-eastern Brazil and north-eastern Argentina. The species *Isoctenus sigma* Schenkel, from French Guiana, is transferred to *Ctenus*.

The following synapomorphies support the monophyly of *Isoctenus*: cymbium with a ventral and a dorsal retrolateral projection, shape of the median apophysis, with elongated retrolateral margin, tegular depression to accommodate the retrolateral rim of the median apophysis, median apophysis with an anterior, and a posterior elongated projection and female palpal claw with elongated teeth.

The genus *Parabatinga* is newly described to include only the species *Ctenus brevipes* Keyserling, based on the following autapomorphies: dorsal branch of RTA with hyaline tip, median apophysis with a longitudinal laminar projection, embolus with a hyaline projection and dorsally projected spermathecae. *Parabatinga* arises as sister group of *Isoctenus*.

## TAXONOMY

FAMILY CTENIDAE KEYSERLING, 1877

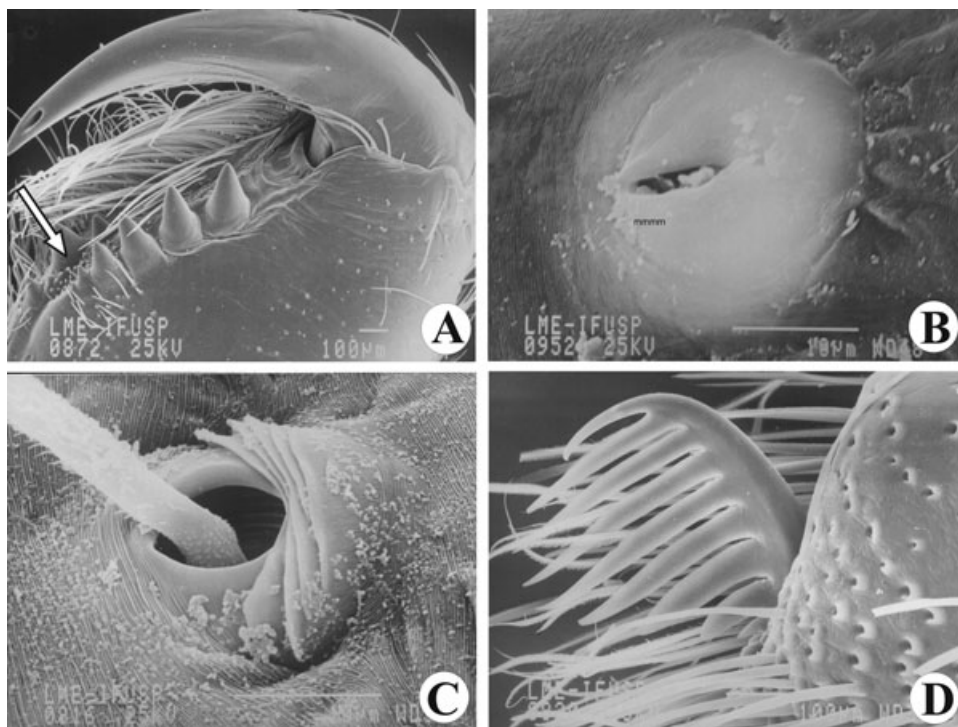
SUBFAMILY CTENINAE KEYSERLING, 1877

GENUS *ISOCTENUS* BERTKAU, 1880 (FIGS 3–15)

*Isoctenus* Bertkau, 1880: 61. Type species *Isoctenus foliiferus* Bertkau, 1880, by monotypy; Pickard-Cambridge, 1897; Mello-Leitão, 1936; Bonnet, 1957: 2311–2312; Lehtinen, 1967: 241; Silva, 2003; Polotow *et al.*, 2005, 2007; Platnick, 2008.

*Ctenopsis* Schmidt, 1956: 29. Type species *Ctenopsis stellata* Schmidt, 1956 (= *Isoctenus janeirus*), by monotypy; Lehtinen, 1967: 225; Platnick, 2008. Syn. nov.

**Diagnosis:** *Isoctenus* are distinguished from other Cteninae genera by the presence of a cymbial ventral and dorsal retrobasal projection, shape of the cup-shaped median apophysis with retrolateral margin well developed, median apophysis with anterior and



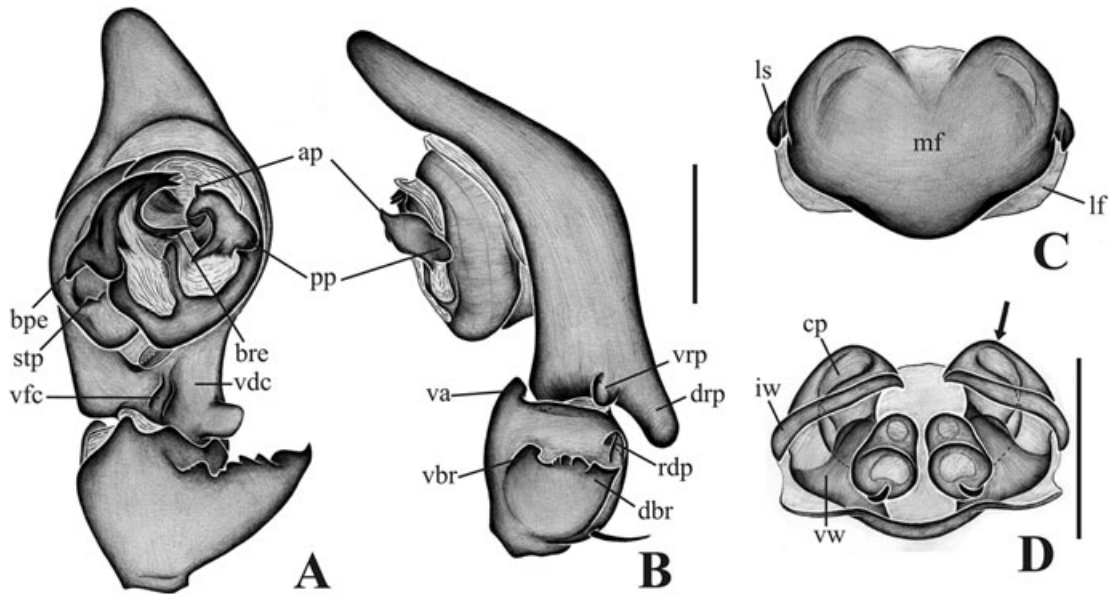
**Figure 3.** *Isoctenus coxalis*: A, chelicerae, intermarginal denticles (arrow); B, tarsal organ; C, trichobothria; D, female pedipalpal tarsal claw.

posterior elongated projection, tegular depression to accommodate the retrolateral margin of the cup-shaped median apophysis in male palp (Fig. 4A, B). Females are distinguished by the pedipalp tarsal claw, with five to ten slender teeth longer than the claw (Figs 3D, 20D).

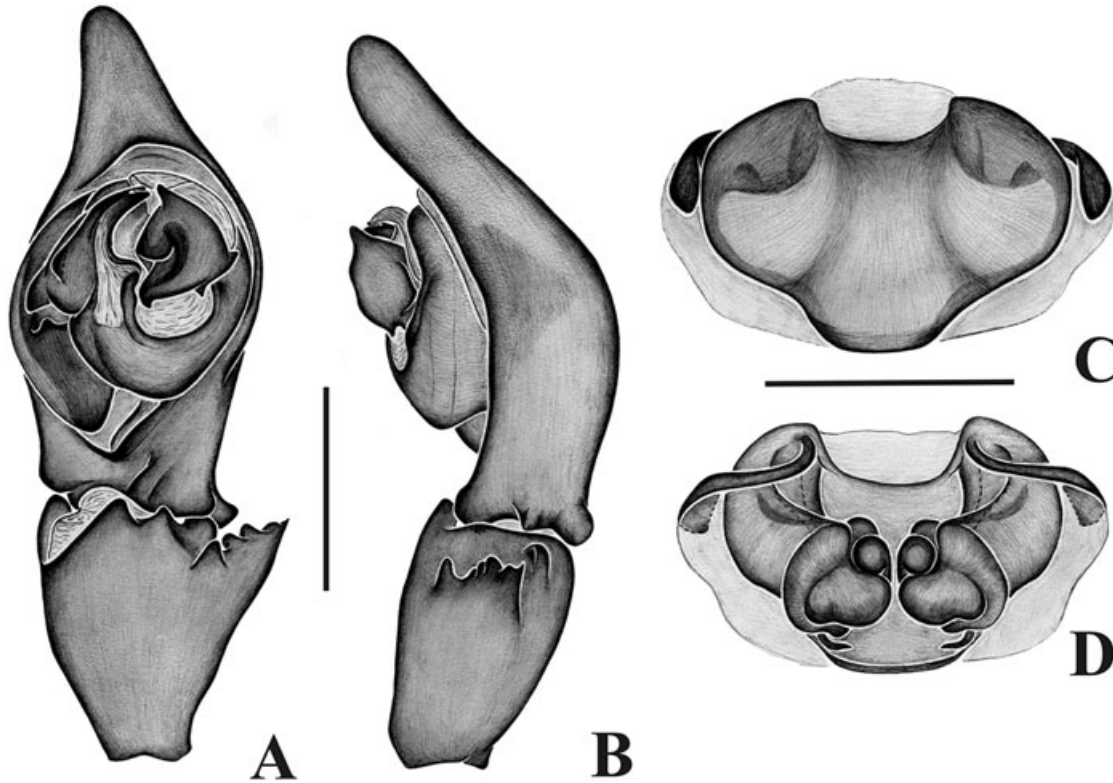
**Redescription:** Small to medium-sized ecribellate spiders. Total body length (males and females) 6.40–22.90. Carapace piriform. Thoracic groove longitudinal. Chilum divided. Eyes ctenoid pattern 2-4-2, with the anterior and posterior row recurved in dorsal view. Clypeus with long, erect black bristles. Clypeus high proportional to AME diameter. Eyes round, except anterior lateral, oval. Chelicerae: promargin with three teeth, the median almost twice as high as the laterals (Fig. 3A); retromargin with four similar sized teeth and one or two smaller ones (Fig. 3A); intermarginal denticles present between pro- and retromarginal teeth (Fig. 3A). Endites: three times labium length, with external lateral margin excavated, distally truncate. Subapical serrula. Labium: short, as long as wide, with rounded tip bearing dense apical scopula. Sternum: oval, not extending between legs IV. Leg formula 4123. Trochanters deeply notched. Ventral scopula on tarsi and metatarsi dense in females and light in males. Tibiae I and II with five pairs of ventral spines and metatarsi I and II with

three pairs of ventral spines. Smooth tarsal organ with oval aperture and a distal fold (Fig. 3B). Trichobothria base with five to six transversal grooves (Fig. 3C). Tarsi with two pectinate claws and dense claw tufts. Female pedipalp claw pectinate with five to ten elongated teeth (Figs 3D, 20D). Abdomen oval with numerous dorsal, erect black bristles.

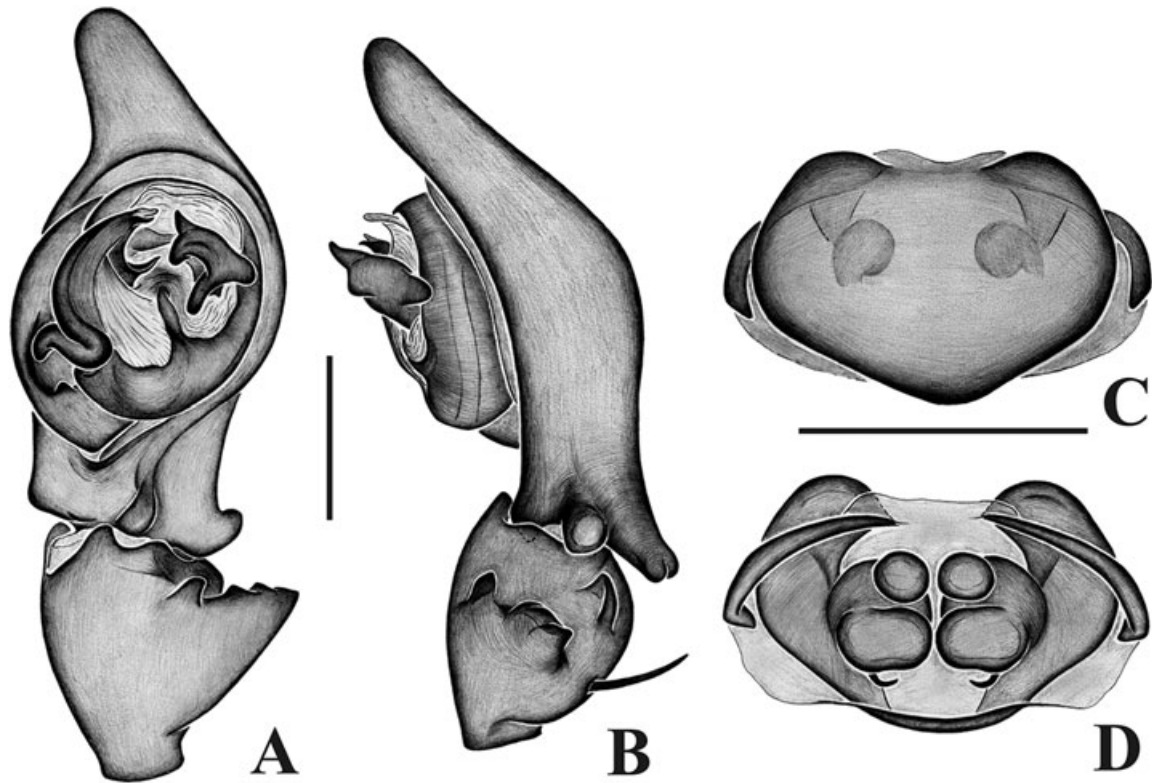
**Male palp:** Retrolateral tibial apophysis well developed, divided in ventral and dorsal branch; the dorsal branch can be elongated and sinuous or short and truncated; ventrobasal depression of cymbium to accommodate the ventral tibial apophysis. Cymbium elongated, distally coniform and proximally sub-rectangular, with a ventral retrolateral projection (secondarily lost in *I. minusculus*) and with a dorsal retrolateral projection (secondarily lost in *I. griseolus*); ventrobasal depression of cymbium delimited retrolaterally by a ventrobasal fold. Tegulum oval, with prolateral depression to accommodate the embolus; tegulum with a large hyaline area, at median apophysis and embolus base, divided by an elongated sclerotized area; embolus laminar and curved (Fig. 19A–I); embolus base presenting a basal prolateral projection that notches on to a depression on the subtegulum (locking lobes *sensu* Griswold, 1993) (Fig. 19A); median apophysis prolaterally excavated and retrolaterally convex (cup-shaped *sensu* Griswold, 1993), with



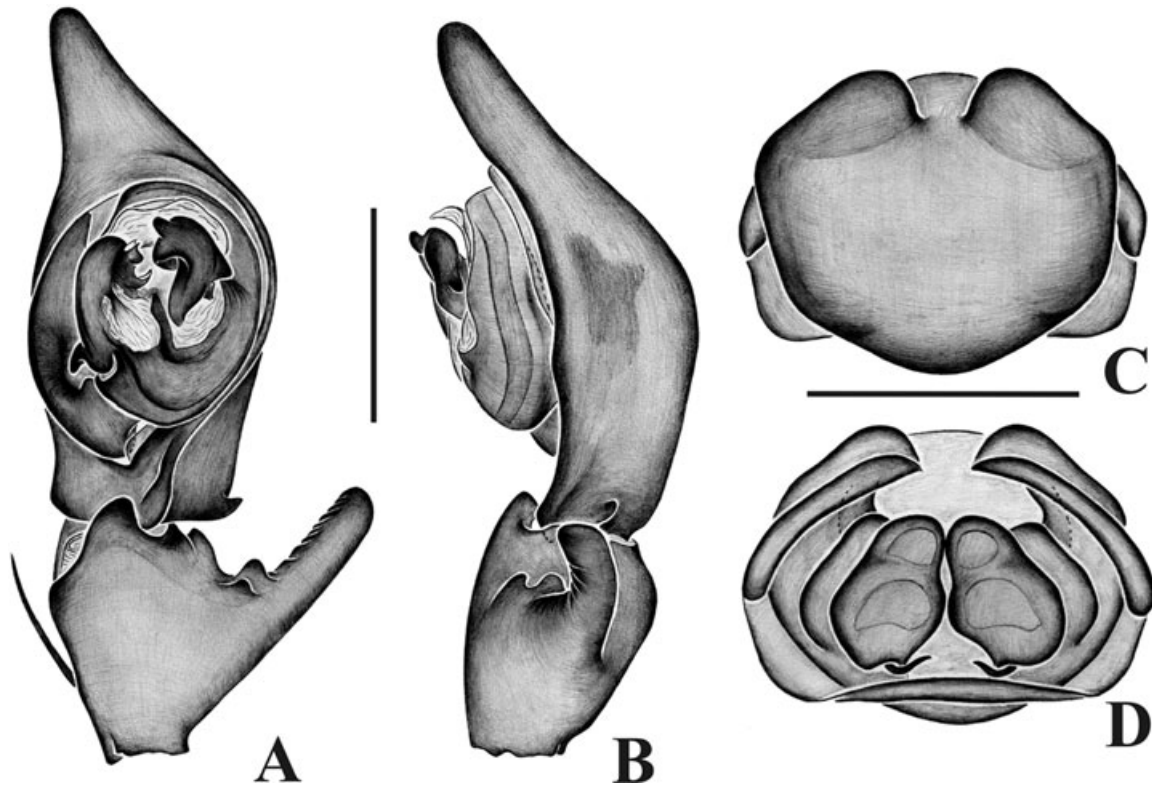
**Figure 4.** *Isoctenus foliifer*: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum, dorsal view. Abbreviations: ap, anterior projection of median apophysis; bpe, basal prolateral projection of embolus; bre, basal retrolateral projection of embolus; cp, copulatory pockets; dbr, dorsal branch of RTA; drp, dorsal retrolateral projection of cymbium; iw, internal wall; lf, lateral field; ls, lateral spurs; mf, median field; pp, posterior projection of median apophysis; rdp, retrolateral distal tibial process; stp, subtegulum projection; va, ventral tibial apophysis; vbr, ventral branch of RTA; vdc, ventrobasal depression of cymbium; vfc, ventrobasal fold of cymbium; vrp, ventral retrolateral projection of cymbium; vw, ventral wall. Arrow, copulatory opening. Scale bars: 0.50 mm.



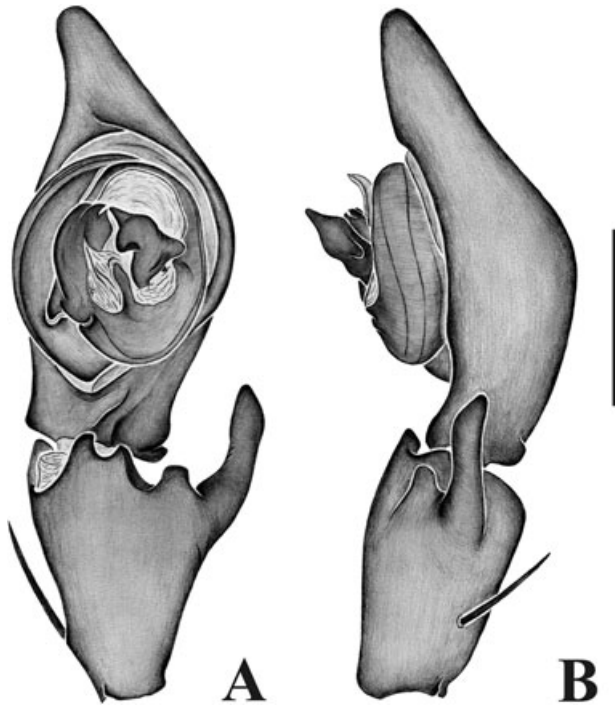
**Figure 5.** *Isoctenus janeirus*: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 1.00 mm.



**Figure 6.** *Isoctenus areia* sp. nov.: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 0.50 mm.



**Figure 7.** *Isoctenus griseolus* comb. nov.: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 1.00 mm.



**Figure 8.** *Isoctenus taperae* comb. nov.: A, male palp, ventral view; B, male palp, retrolateral view. Scale bars: 1.00 mm.

a reduced prolateral margin and a well-developed retrolateral margin; median tegular depression to accommodate the well-developed retrolateral margin of the median apophysis; in ventral view, the median apophysis presents a ‘?’ shape, bearing an anterior and a posterior elongated projection (Fig. 19I); conductor laminar, short and hyaline, not wrapping the tip of embolus; subtegulum well developed and prolaterally positioned, median area of the subtegulum with a depression limited by a basal projection, to notch on to the basal prolateral projection of the embolus (Fig. 4A, B).

**Epigynum.** Divided into median and lateral fields which bear lateral spurs; median field rounded, oval or subquadrangular; lateral projections positioned anteriorly and dorsally as an internal wall, completely or partially visible in ventral view; copulatory openings situated anteriorly (Fig. 4C). Short copulatory ducts covered by a ventral wall, which can be smooth, present a fold behind the spermathecae or cover part of the spermathecae; spermathecae divided into a base and head (bearing pores); short fertilization ducts, originating at the base of the spermathecae (Fig. 4D).

**Transference.** *Isoctenus sigma* Schenkel, 1953 is transferred to *Ctenus*.

**Species inquirenda:** *Isoctenus latevitattus* Caporiacco, 1954 (two immature male and one immature female from Charvein, French Guiana, deposited in MNHN, not found, probably lost). Platnick, 2008.

**Composition:** Fifteen valid species.

**Distribution:** South America, from north-eastern Brazil to northern Argentina and Uruguay, in Atlantic Forest, ‘Cerrado’ (Brazilian savanna), and urban regions.

*ISOCTENUS FOLIIFER* BERTKAU, 1880  
(FIGS 4A–D, 19E)

*Isoctenus foliiferus* Bertkau, 1880: 61 (immature female holotype from Rio de Janeiro, Brazil, not found in any European museum, probably lost, see Levi, 1991: 203); Pickard-Cambridge, 1897: 56, 69; Lehtinen, 1967: 241.

*Isoctenus foliifer* Bonnet, 1957: 2312; Lehtinen, 1967: 241; Platnick, 2008.

**Neotype:** Male from Fazenda Maravilha, Paraíba do Sul, Rio de Janeiro, Brazil, 16–18.viii.2001, Equipe Biota, deposited in IBSP 66376.

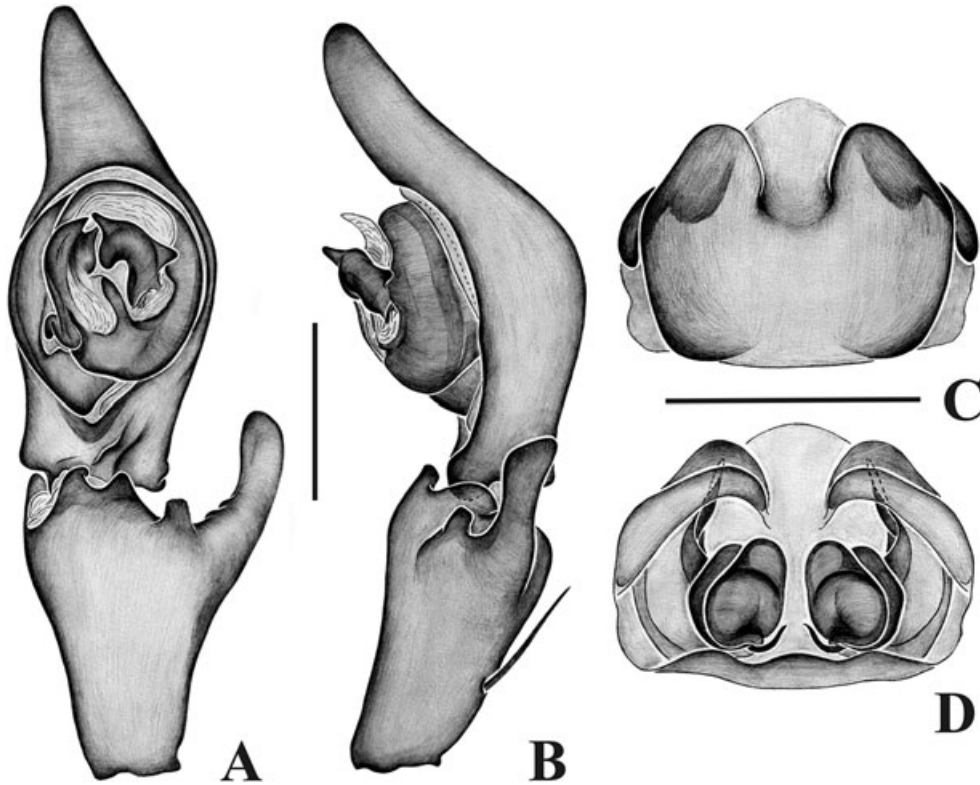
**Note:** The neotype was proposed based on the coloration pattern and body size information in the original description. The specimen described as *I. foliiferus* by Mello-Leitão (1936) is in fact a *Ctenus longipes* Keyserling, and represents a misidentification.

**Additional material examined:** BRAZIL. *Espírito Santo:* Conceição da Barra, Parque Estadual de Itaúnas, 12 males, 4 females (IBSP); São Mateus, Reserva Florestal Vale do Rio Doce, 5 males, 9 females (IBSP 12680, 12727, 12795, 12844, 16513, 16735, 16743, 16783, 16815, 16864, 16932, 17475). *Rio de Janeiro:* Paraíba do Sul, Fazenda Maravilha, 4 males, 9 females (IBSP).

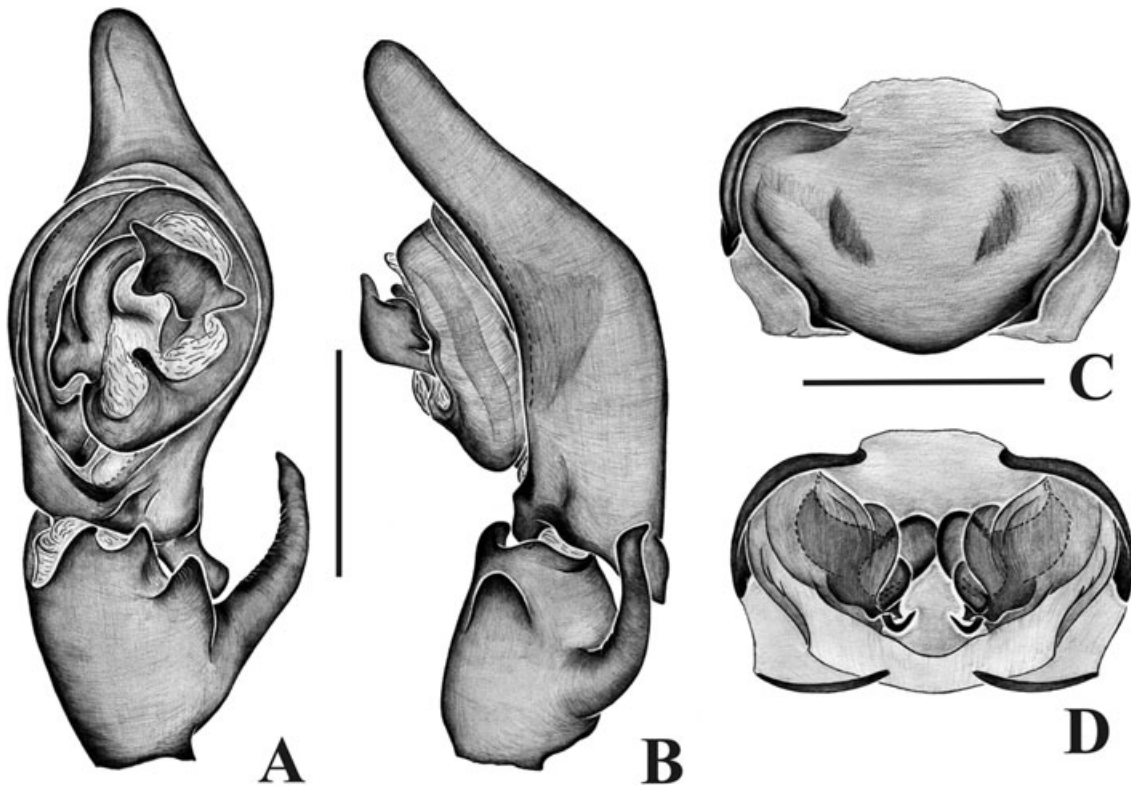
**Diagnosis:** *Isoctenus foliifer* resembles *I. janeirus* by the robust embolus in the male palp and by the cordiform median field in the epigynum, but can be distinguished by the short tibia, dorsal branch of RTA with elongated tip, dorsal retrolateral projection of the cymbium elongated, posterior projection of the median apophysis large and laminar in the male palp (Fig. 4A, B) and by the short lateral spurs (Fig. 4C) and the morphology of the spermathecae in the epigynum (Fig. 4D).

**Description:** **Male** (neotype). Carapace reddish brown, thoracic groove brown, with diverging dark stripes from the thoracic groove to the margin of the

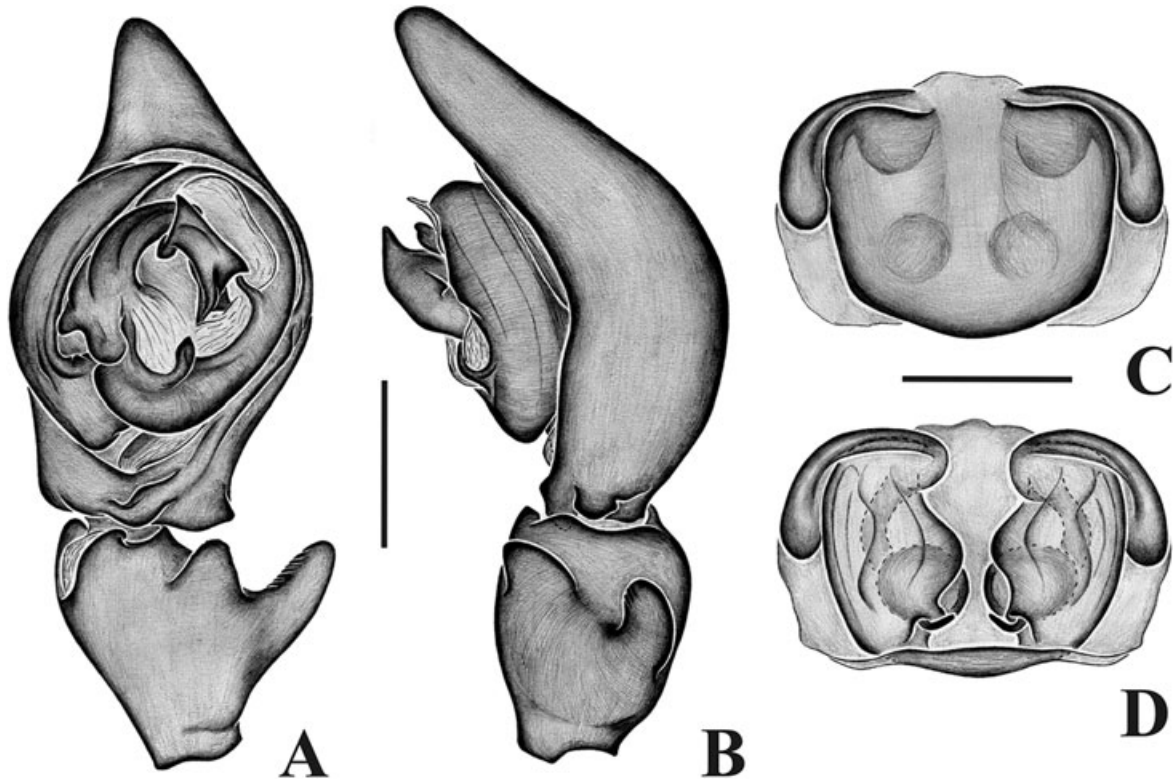




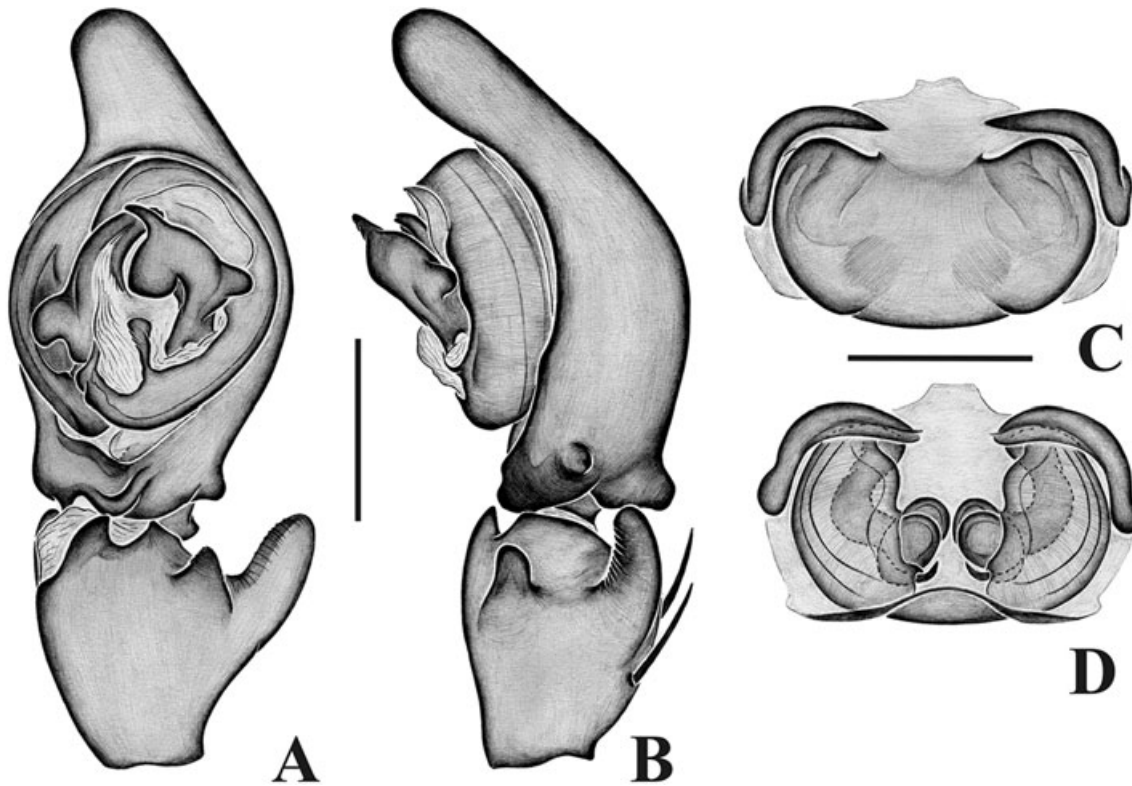
**Figure 9.** *Isoctenus ordinario* sp. nov.: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 1.00 mm.



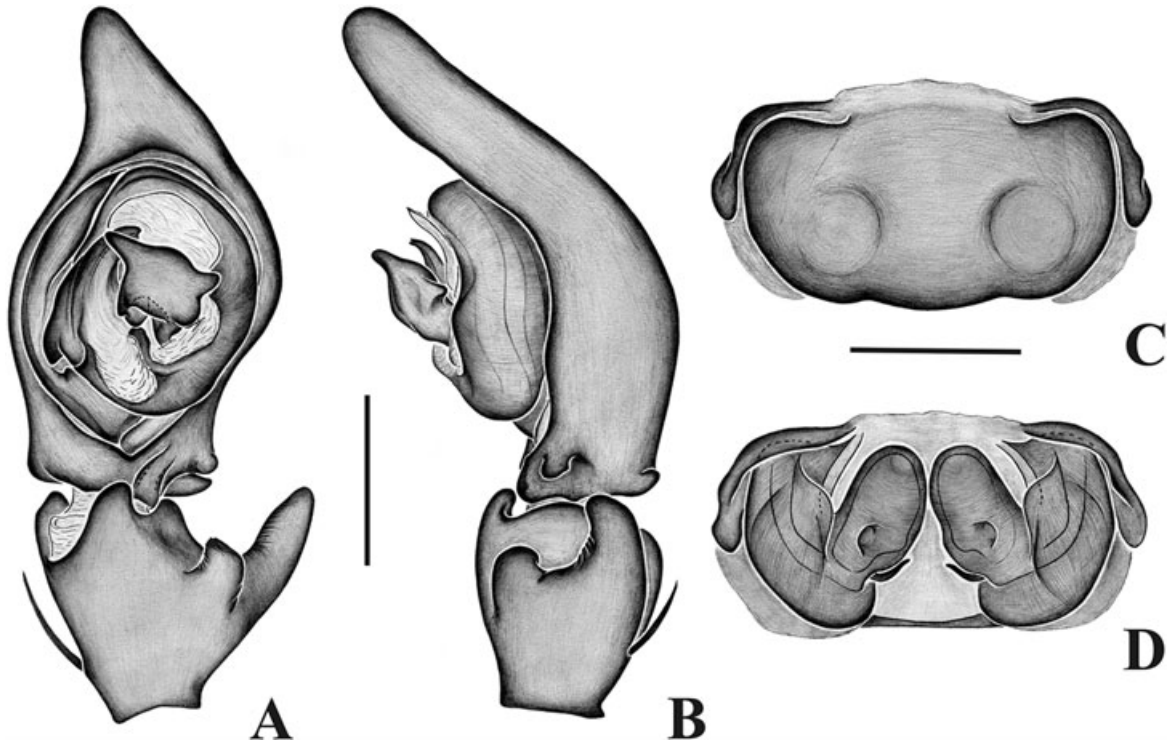
**Figure 10.** *Isoctenus eupalaestrus*: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 0.50 mm.



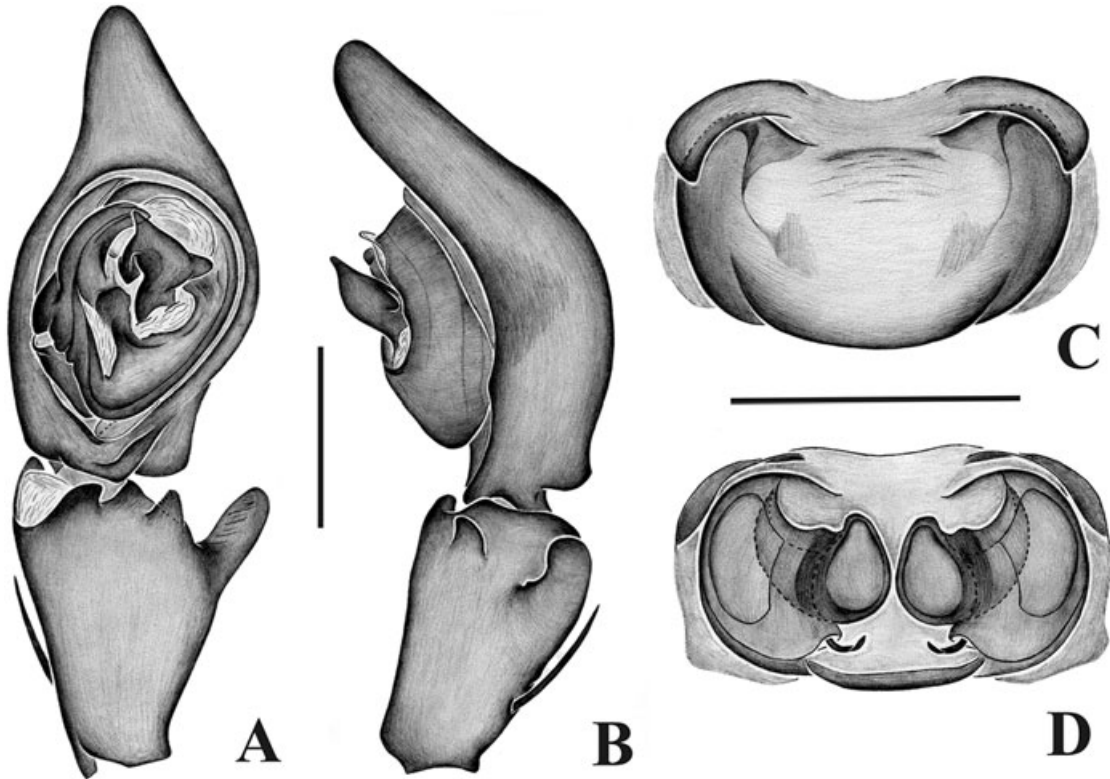
**Figure 11.** *Isoctenus segredo* sp. nov.: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 0.50 mm.



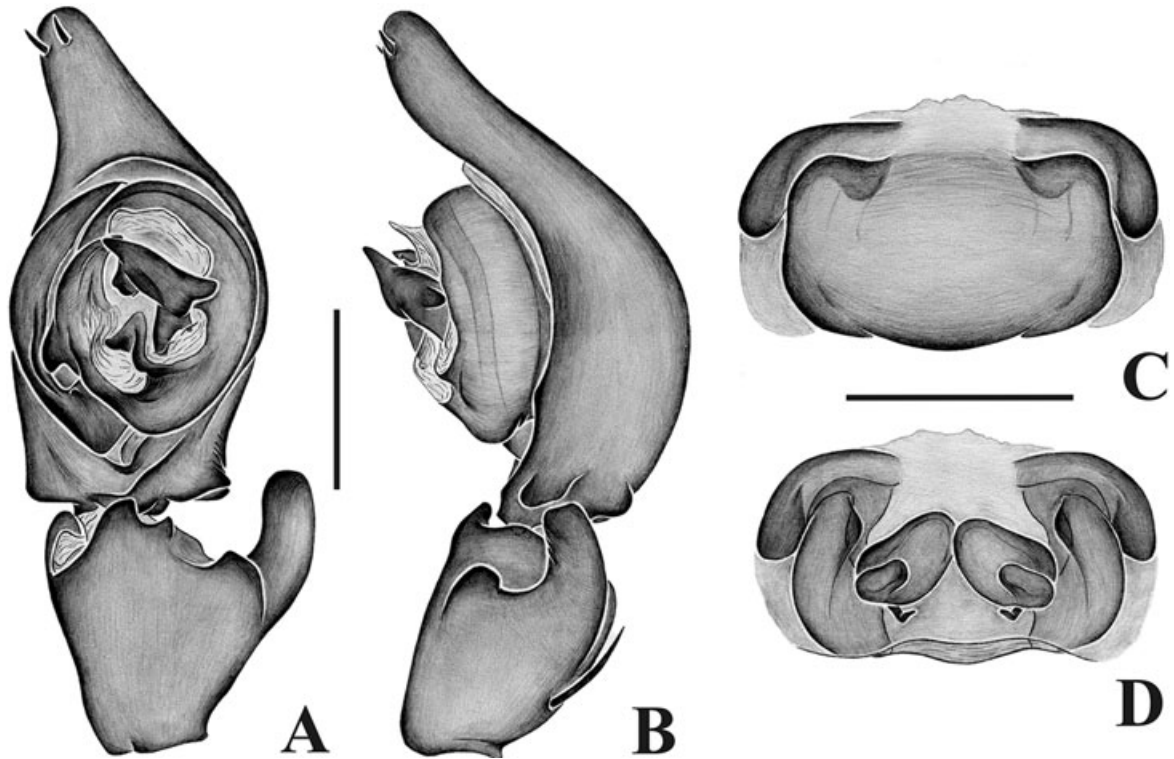
**Figure 12.** *Isoctenus charada* sp. nov.: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 0.50 mm.



**Figure 13.** *Isoctenus herteli* comb. nov.: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 0.50 mm.



**Figure 14.** *Isoctenus minusculus* comb. nov.: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 0.50 mm.



**Figure 15.** *Isoctenus strandi*: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 0.50 mm.

carapace; sternum, endites, labium and legs reddish brown; chelicerae dark reddish brown; abdomen dark brown, with a longitudinal lighter stripe with indented border, from the pedicel to the anal tubercle. Total length 11.80. Carapace 6.10 long and 4.80 wide. Clypeus 0.14 high. Eye diameter: AME 0.16, ALE 0.14, PME 0.18, PLE 0.18. Leg measurements: I: femur 6.10/ patella 2.70/ tibia 6.30/ metatarsus 6.10/ tarsus 2.90/ total 24.10; II: 5.60/ 2.50/ 5.20/ 5.30/ 2.30/ 20.90; III: 4.90/ 2.20/ 4.20/ 5.00/ 2.00/ 18.30; IV: 6.40/ 2.40/ 6.00/ 8.10/ 2.60/ 25.50. Leg spination: tibia I and II v2-2-2-2, r1-1-0, p0-1-0, III and IV v2-2-2, r1-1, p1-1; metatarsus I, II and III v2-2-2, r1-1-1, p1-1-1, IV v1-1-1-1-2, r1-1-1, p1-1-1. Palp: tibia approximately one-third cymbium length; RTA with ventral branch short and dorsal branch short and truncated, with several internal folds; tibia with rounded ventral apophysis and excavated retrolateral distal process (Fig. 4A, B). Cymbium with a rounded ventral retrolateral projection; embolus with bifid tip and basal retrolateral projection elongated (Fig. 19E); prolateral basal projection of embolus slender and elongated; median apophysis robust with reduced anterior projection (Fig. 4A).

*Female* (IBSP). Coloration as in male. Total length 11.00. Carapace 5.10 long and 3.90 wide. Clypeus 0.14 high. Eye diameters: AME 0.20, ALE 0.14, PME 0.28,

PLE 0.23. Legs measurements: I: femur 3.20/ patella 1.60/ tibia 2.90/ metatarsus 2.30/ tarsus 1.00/ total 11.00; II: 3.00/ 1.50/ 2.40/ 2.20/ 1.00/ 10.10; III: 2.60/ 1.20/ 2.10/ 2.40/ 1.10/ 9.40; IV: 3.50/ 1.40/ 3.20/ 4.00/ 1.40/ 13.50. Leg spination as in male, except tibia I and II r0, p0; metatarsus I and II r0, p0. Epigynum: median field with anterior margin excavated and posterior margin rounded; lateral spurs partially covered by the median field (Fig. 4C). Spermathecae with a large base and a rounded head; ventral wall with a fold behind the spermathecae (Fig. 4D).

*Variation*: Ten males: total length 8.40–10.40, carapace 4.30–5.70, femur I 4.40–5.40; ten females: total 8.50–11.40, carapace 4.20–5.30, femur I 3.20–4.20.

*Distribution*: South-eastern Brazil, States of Espírito Santo and Rio de Janeiro.

*ISOCTENUS JANEIRUS* (WALCKENAER, 1837)  
(FIGS 5A–D, 19G)

*Ctenus janeirus* Walckenaer, 1837: 364 (male holotype from Rio de Janeiro, Brazil, deposited in MNHN, lost, see Pickard-Cambridge, 1897: 57); Pickard-Cambridge, 1897: 61, 63; Bonnet, 1957: 2312; Lehtinen, 1967: 241; Platnick, 2008.

*Ctenus sanguineus* Walckenaer, 1837: 365 (male holotype from Brazil, deposited in MNHN, lost, see Pickard-Cambridge, 1897: 57); Pickard-Cambridge, 1897: 61; Bonnet, 1956: 1289; Platnick, 2008. Syn. nov.

*Ctenus cinnamoneus* C. L. Koch, 1847: 58, fig. 1457 (immature male holotype from South America, deposited in NMB, destroyed); Pickard-Cambridge, 1897: 62, 63 (syn.); Bonnet, 1957: 2312; Platnick, 2008.

*Isoctenus janeirus* Mello-Leitão, 1936: 18, 20; Bonnet, 1957: 2312; Platnick, 2008.

*Ctenus semiornatus* Mello-Leitão, 1939: 526, figs 7–8 (female holotype from 'Caetetuba', currently Atibaia, São Paulo, Brazil, deposited in IBSP 370, examined); Bonnet, 1956: 1289; Platnick, 2008. Syn. nov.

*Ctenopsis stellata* Schmidt, 1956: 29 (female holotype from Brazil, deposited in FMS 37464, lamina FMS 1/78, examined); Platnick, 2008. Syn. nov.

*Isoctenus janeiricus* Bonnet, 1957: 2312 (erroneous replacement name).

**Synonymies:** This species was recognized based on the coloration pattern illustrated and described by C. L. Koch (1847) for *Ctenus cinnamoneus*. The synonymy of *Ctenus sanguineus* was based on the coloration pattern described by Walckenaer (1837).

**Note:** The specimen described as *Isoctenus janeirus* by Mello-Leitão (1936: 20, pl. II, fig. 42) and the specimen described as *Ctenus sanguineus* by Mello-Leitão (1936: 12, pl. I, fig. 24) were both misidentifications. The first is an *Isoctenus coxalis* and the second is an *I. ordinario* sp. nov.

**Additional material examined:** BRAZIL. *Minas Gerais:* Lima Duarte, Parque Estadual do Ibitipoca, 1 female (IBSP 23796). *Rio de Janeiro:* Rio de Janeiro, 1 female (IBSP 15357); Magé, Inhomirim, Fazenda Mandioca, 1 female (MZSP 15197); Teresópolis, Parque Nacional da Serra dos Órgãos, 1 male, 1 female (IBSP). *São Paulo:* Guapiara, Parque Estadual Intervales, 2 females (IBSP 20571); Pindamonhangaba, 1 female (IBSP 19982); Piracaia, 1 female (IBSP 8540); Cotia, 1 male (IBSP 32138); São Paulo, 1 male (IBSP 3645); Itapeperica da Serra, 2 males (IBSP 49024); São Lourenço da Serra, 1 female (IBSP 59773); Guarujá, 1 male (IBSP 3646); Bertioga, 1 male (IBSP 24077); São Sebastião, 1 male (IBSP 6427); Itanhaém, 1 female (IBSP 27726); Peruibe, 1 female (IBSP 4774); Iguape, 1 female (IBSP 3156).

**Diagnosis:** *Isoctenus janeirus* resembles *I. foliifer* by the robust embolus in the male palp and by the cordiform median field in the epigynum, but can be distinguished by the elongated tibiae, RTA with a ventral branch short and dorsal branch truncated, dorsal retrolateral projection of the cymbium short

and rounded, robust median apophysis with small anterior and posterior projection and embolus with a laminar ventral process in the male palp (Fig. 5A, B) and by median field strongly sclerotized with posterior margin projected and spermathecae with small head in the epigynum (Fig. 5C, D).

**Description: Male** (IBSP 4686). Carapace, chelicerae, labium, endites, sternum and legs dark brown; a longitudinal lighter stripe from the eyes to the posterior margin of the carapace; abdomen brown with a lighter arrow mark on dorsal area and with four longitudinal lighter lines from the epigastric furrow to the spinnerets. Total length 15.20. Carapace 8.30 long and 7.00 wide. Clypeus 0.28 high. Eye diameters: AME 0.34, ALE 0.32, PME 0.42, PLE 0.35. Legs measurements: I: femur 7.90/ patella 3.70/ tibia 8.30/ metatarsus 7.90/ tarsus 2.90/ total 30.70; II: 7.20/ 3.40/ 6.50/ 6.50/ 2.30/ 25.90; III: 6.50/ 2.90/ 5.30/ 6.30/ 2.00/ 23.00; IV: 8.10/ 3.10/ 7.40/ 10.10/ 2.90/ 31.60. Leg spination as in *I. foliifer*, except metatarsus IV p1-1-1-1. Palp: tibia approximately one-third cymbium length; dorsal branch of RTA with several internal folds and pointed tip; tibia with rounded ventral apophysis and retrolateral distal process excavated (Fig. 5A, B). Cymbium with a short ventral retrolateral projection; embolus with bifid tip and basal retrolateral projection short (Fig. 5A); prolateral basal projection of embolus short and robust (Fig. 5A).

**Female** (IBSP 8057). Coloration as in male. Total length 19.50. Carapace 8.20 long and 6.50 wide. Clypeus 0.32 high. Eye diameters: AME 0.29, ALE 0.26, PME 0.39, PLE 0.36. Leg measurements: I: femur 6.00/ patella 3.40/ tibia 6.40/ metatarsus 4.90/ tarsus 2.10/ total 22.80; II: 5.70/ 3.40/ 5.40/ 4.70/ 3.00/ 22.20; III: 5.10/ 3.00/ 4.70/ 4.60/ 2.00/ 19.40; IV: 6.40/ 3.40/ 6.40/ 7.40/ 2.40/ 26.00. Leg spination as in *I. foliifer*, except metatarsus IV r1-1-1-1. Epigynum: median field with anterior margin excavated; lateral spurs partially covered by the median field and with rounded tip (Fig. 5C). Spermathecae with a well-developed base; ventral wall with a fold behind the spermathecae (Fig. 5D).

**Variation:** Ten males: total length 11.30–15.90, carapace 6.20–8.50, femur I 6.70–8.30; ten females: total length 15.70–22.90, carapace 7.20–10.40, femur I 5.30–8.00.

**Distribution:** South-eastern of Brazil, States of Minas Gerais, Rio de Janeiro and São Paulo.

#### ***ISOCTENUS AREIA* SP. NOV. (FIG. 6A–D)**

**Type material:** Male holotype from Matinha EAN, Areia, Paraíba, Brazil, 12.iv.1997, A. D. Brescovit, deposited in IBSP 59771. Paratypes: 1 female from

Mata do Guarim, Areia, Paraíba, Brazil, 12.iv.1997, A. D. Brescovit, deposited in IBSP 59772; 2 males from Mata do Guarim, Areia, Paraíba, Brazil, 12.iv.1997, A. D. Brescovit, deposited in IBSP 10272.

*Additional material examined:* BRAZIL. Paraíba: Areia, Matinha EAN, 3 males (IBSP 10292); João Pessoa, UFPB, Campus II, 1 male (IBSP 40996).

*Etymology:* The species epithet is a toponym in apposition and it is a Portuguese noun meaning 'sand'.

*Diagnosis:* *Isoctenus areia* sp. nov. resembles *I. janeirus* by the morphology of the RTA in the male palp, but can be distinguished by the cymbium with retrolateral ventral projection well developed and elongated retrolateral dorsal projection and with truncated tip and slender median apophysis in the male palp (Fig. 6A, B) and by the cordiform median field with anterior margin slightly excavated and lateral spurs elongated in the epigynum (Fig. 6C).

*Description:* Male (IBSP 59771). Coloration as in *I. foliifer*. Total length 7.50. Carapace 4.30 long and 3.30 wide. Clypeus 0.10 high. Eye diameters: AME 0.18, ALE 0.16, PME 0.20, PLE 0.20. Leg measurements: I: femur 4.50/ patella 1.90/ tibia 4.90/ metatarsus 4.20/ tarsus 2.00/ total 17.50; II: 4.00/ 1.80/ 4.00/ 3.60/ 1.60/ 15.00; III: 3.50/ 1.60/ 3.30/ 3.60/ 1.50/ 13.50; IV: 4.70/ 1.70/ 4.80/ 5.70/ 2.00/ 18.90. Leg spination as in *I. foliifer*, except tibia I p1-1-0. Coxa IV with ventral apophysis (Polotow *et al.*, 2005, fig. 5). Palp: tibia short, approximately half cymbium length; RTA with ventral branch short and dorsal branch truncated with several internal folds and short tip; tibia with rounded ventral apophysis and retrolateral distal process excavated (Fig. 6A, B). Robust embolus, with bifid tip and basal retrolateral projection elongated; prolateral basal projection of embolus elongated; median apophysis with anterior projection elongated and posterior projection laminar (Fig. 6A).

*Female* (IBSP 59772). Coloration as in *I. foliifer*. Total length 8.50. Carapace 3.90 long and 2.80 wide. Clypeus 0.14 high. Eye diameters: AME 0.14, ALE 0.12, PME 0.22, PLE 0.18. Legs measurements: I: femur 3.20/ patella 1.70/ tibia 3.20/ metatarsus 2.40/ tarsus 1.10/ total 11.60; II: 2.90/ 1.50/ 2.70/ 2.10/ 1.00/ 10.20; III: 2.60/ 1.20/ 2.20/ 2.30/ 1.00/ 9.30; IV: 3.50/ 1.40/ 3.50/ 3.50/ 1.40/ 13.30. Leg spination as in *I. foliifer*, except metatarsus IV p1-1-1-1. Epigynum: median field with posterior margin slightly projected; lateral spurs partially covered by the median field and with narrow tip (Fig. 6C). Spermathecae with large base and small rounded head; ventral wall with a fold behind the spermathecae (Fig. 6D).

*Variation:* Six males: total length 6.40–8.50, carapace 3.60–4.60, femur I 3.70–4.70.

*Distribution:* North-eastern Brazil, State of Paraíba.

*ISOCTENUS COXALIS* (PICKARD-CAMBRIDGE, 1902)  
(FIGS 3A–D, 18A, 19F, 20D)

*Isoctenus janeirus* Walckenaer, 1837; Mello-Leitão, 1936: 20, pl. II, fig. 42 (misidentification).

*Ctenus velox* Keyserling, 1891: 147, pl. 4, fig. 100 (male holotype from Alto da Serra, Nova Friburgo, Rio de Janeiro, Brazil, 1.vii.1890, Göldi, deposited in BMNH 2919, examined) (preoccupied by Blackwall, 1865); Pickard-Cambridge, 1897: 65; Bonnet, 1956: 1278; Platnick, 2008.

*Ctenus coxalis* Pickard-Cambridge, 1902: 412 (replacement name for *C. velox* Keyserling); Bonnet, 1956: 1278; Simó & Brescovit, 2001: 69, 79; Silva, 2003: 9.

*Ctenus velocitarcis* Roewer, 1951: 446 (superfluous replacement name).

*Isoctenus coxalis* Silva, 2003: 26; Polotow *et al.*, 2005: 38, figs 1–5; Platnick, 2008.

*Note:* The specimen described as *Ctenus velox* by Mello-Leitão (1936: 14, pl. III, figs 28, 29) was a misidentification, and it is an undescribed species.

*Additional material examined:* BRAZIL. Mato Grosso: 1 female (IBSP 421). Goiás: São Mateus, Gruta Matilde, 1 male, 2 females (IBSP 2709, 5166). Distrito Federal: Brasília, 1 female (IBSP 4667); Bahia: Ituaçu, Gruta Mangabeira, 1 female (IBSP). Minas Gerais: Uberlândia, 1 female (MCN 17709); Barão dos Cocais, 2 females (IBSP 2506); Munhoz, 2 females (IBSP 33246, 33248). São Paulo: Pirajú, Usina Hidrelétrica de Pirajú, 1 female (IBSP 37425); Águas de Santa Bárbara, 1 female (IBSP 7753); Aguai, 1 female (IBSP 7626); Capivari, 1 male (IBSP 44311); Indaiatuba, 1 male (IBSP 37854); Caçapava, 1 female (IBSP 35004); Guaratinguetá, 2 females (IBSP 2667); Porto Feliz, 1 male (IBSP 4700); Valinhos, 1 female (IBSP 8595); Sorocaba, 1 female (IBSP 8348); Santos, 1 male (IBSP 2486); Tatuí, 2 males, 1 female (IBSP 7625); Vargem Grande Paulista, 1 male (IBSP 19935); São Roque, 1 female (IBSP 20446); Mogi das Cruzes, 1 male (IBSP 8251); Salesópolis, Estação Ecológica de Boracéia, 1 female (IBSP 7442); Ubatuba, 1 female (IBSP 4673). Paraná: Telêmaco Borba, 1 female (IBSP 6575); Curitiba, 1 male (IBSP 8527); Tijucas do Sul, Lagoa, 1 male (IBSP 39062). Rio Grande do Sul: São Jerônimo, 1 female (MCN 9798); Guaíba/Sertão Santana, 1 female (MCN 28939); Porto Alegre, 2 males (MCN 446); Viamão, Médio Arroio Pesqueiro, 30°09'S 50°57'W, 1 female (MCN 33183).

*Diagnosis:* *Isoctenus coxalis* resembles *I. corymbus* by the morphology of the median apophysis and embolus (Fig. 19F) in the male palp, but can be distinguished by the short tibiae, ventral branch of RTA elongated, with narrow tip and posterior projection of the median apophysis laminar in the male palp (Polotow *et al.*, 2005, figs 1, 2). Females are recognized by the lateral spurs short and robust with pointed tip and the smooth spermathecae in the epigynum (Polotow *et al.*, 2005, figs 3, 4).

*Description:* Male and female are described in Polotow *et al.* (2005: 38, figs 1–5).

*Distribution:* Central-western, south-eastern and south of Brazil, States of Mato Grosso, Goiás, Distrito Federal, Bahia, Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, Paraná and Rio Grande do Sul.

#### *ISOCTENUS CORYMBUS* POLOTOW *ET AL.*, 2005

*Isoctenus corymbus* Polotow *et al.*, 2005: 40, figs 6–9 (male holotype from Lapa do Angélica, Parque Estadual de Terra Ronca, São Domingos, Goiás, Brazil, ix.2004, F. Pellegatti-Franco, deposited in IBSP 47613. Paratypes: 1 female, same data as holotype, deposited in IBSP 36325; 1 male from the same locality as holotype, ix.2000, deposited in MZSP; 1 female paratype from the same locality as holotype, iii.2005, deposited in MZSP, examined). Platnick, 2008.

*Additional material examined:* None.

*Diagnosis:* *Isoctenus corymbus* resembles *I. coxalis* by the morphology of the median apophysis and embolus in the male palp, but can be distinguished by the elongated tibia, ventral branch of RTA short, dorsal branch of RTA with truncated tip in male palp (Polotow *et al.*, 2005, figs 6, 7) and by the elongated lateral spurs, spermathecae with a small head and base with a median groove in the epigynum (Polotow *et al.*, 2005, figs 8, 9).

*Description:* Male and female are described in Polotow *et al.* (2005: 38, figs 6–9).

*Distribution:* Central-western Brazil, State of Goiás.

#### *ISOCTENUS GRISEOLUS* (MELLO-LEITÃO, 1936) COMB. NOV. (Fig. 7A–D)

*Ctenus griseolus* Mello-Leitão, 1936: 7, pl. 1 fig. 8, pl. 2 figs 6, 7 (male holotype from Rio de Janeiro, Brazil,

C. Mello-Leitão, deposited in MNRJ 132, examined); Mello-Leitão, 1936: 3; Bonnet, 1956: 1281; Platnick, 2008.

*Additional material examined:* BRAZIL. Rio de Janeiro: Petrópolis, 1 female (MNRJ 161); Rio de Janeiro, Jacarepaguá, Represa da Covanca, 1 female (MNRJ 13433); Araruama, Lagoa de Jutunaíba, 1 male (MNRJ).

*Diagnoses:* *Isoctenus griseolus* comb. nov. resembles *I. corymbus* by the morphology of the median apophysis in the male palp, but can be distinguished by the additional small projection in the ventral branch of RTA, dorsal branch of RTA with round tip in male palp (Fig. 7A, B) and by the median field posteriorly projected and the smooth spermathecae (Fig. 7C, D) in the epigynum.

*Description:* Male (MNRJ, Araruama, Rio de Janeiro). Coloration as in *I. foliifer*. Total length 13.80. Carapace 7.80 long and 6.30 wide. Clypeus 0.30 high. Eye diameters: AME 0.26, ALE 0.22, PME 0.34, PLE 0.30. Leg measurements: I: femur 7.40/ patella 3.30/ tibia 8.10/ metatarsus 7.70/ tarsus 3.20/ total 29.70; II: 7.10/ 2.90/ 6.50/ 6.50/ 2.80/ 25.80; III: 6.20/ 2.50/ 5.10/ 6.50/ 2.30/ 22.60; IV: 8.10/ 2.90/ 7.50/ 10.50/ 3.00/ 32.00. Leg spination as in *I. foliifer*. Coxa IV with ventral apophysis (Polotow *et al.*, 2005, fig. 5). Palp: tibia short, approximately half cymbium length; RTA with a ventral branch short and dorsal branch elongated with internal grooves; tibia with robust ventral apophysis (Fig. 7A, B). Cymbium with short and laminar ventral retrolateral projection; embolus short and robust with bifid tip and basal projection short and curved; robust median apophysis, with anterior projection short and rounded and posterior projection short and conical (Fig. 7A, B).

*Female* (MNRJ 161). Coloration as in *I. foliifer*. Total length 13.00. Carapace 6.20 long and 5.40 wide. Clypeus 0.25 high. Eye diameters: AME 0.28, ALE 0.28, PME 0.35, PLE 0.30. Leg measurements: I: femur 6.90/ patella 3.50/ tibia 6.50/ metatarsus 5.10/ tarsus 2.00/ total 24.00; II: 6.60/ 3.20/ 5.50/ 4.70/ 1.90/ 21.90; III: 5.10/ 2.70/ 4.10/ 4.60/ 1.90/ 18.40; IV: 7.40/ 3.00/ 6.40/ 8.00/ 1.90/ 26.70. Leg spination as in *I. foliifer*. Epigynum: median field rounded, with anterior margin excavated; lateral spurs short, partially covered by the median field and with rounded tip (Fig. 7C). Spermathecae with rounded head and large base; ventral wall with a fold behind the spermathecae (Fig. 7D).

*Variation:* Two females: total 13.00–16.80, carapace 6.20–7.30, femur I 6.50–6.90.

*Distribution:* South-eastern Brazil, State of Rio de Janeiro.

*ISOCTENUS TAPERAE* (MELLO-LEITÃO, 1936)  
COMB. NOV. (FIG. 8A, B)

*Ctenus taperae* Mello-Leitão, 1936: 13, pl. 3, figs 25, 26 (male holotype from 'Tapera', currently Moreno, Pernambuco, Brazil, B. Pickel, deposited in MNRJ 145, examined); Mello-Leitão, 1936: 3; Platnick, 2008.

*Ctenus taperanus* Bonnet, 1956: 1290 (erroneous replacement name).

*Additional material examined:* BRAZIL. Minas Gerais: Ouro Preto, 1 male (MNRJ 2906).

*Diagnosis:* *Isoctenus taperae* comb. nov. resembles *I. ordinario* sp. nov. by the morphology of the embolus and median apophysis in male palp (Fig. 8A), but can be distinguished by the short tibiae and the dorsal branch of RTA elongated with narrow tip in male palp (Fig. 8A, B).

*Description:* Male (MNRJ 2906). Coloration as in *I. foliifer*. Total length 13.70. Carapace 7.20 long and 5.60 wide. Clypeus 0.43 high. Eye diameters: AME 0.28, ALE 0.28, PME 0.42, PLE 0.26. Leg measurements: I: femur 8.00/ patella 3.80/ tibia 7.80/ metatarsus 7.80/ tarsus 3.70/ total 31.10; II: 7.10/ 3.20/ 6.80/ 6.80/ 3.00/ 26.90; III: 6.10/ 2.80/ 5.10/ 6.40/ 2.40/ 22.80; IV: 8.50/ 3.00/ 7.80/ 10.20/ 3.30/ 32.80. Leg spination as in *I. foliifer*. Coxa IV with ventral apophysis (Polotow *et al.*, 2005, fig. 5). Palp: tibia approximately two-thirds cymbium length; RTA with ventral branch truncated and dorsal branch with internal grooves; tibia with slender and elongated ventral apophysis (Fig. 8A, B). Cymbium with ventral retrolateral projection reduced and dorsal retrolateral projection rounded; short and laminar embolus, with bifid tip and short basal projection; robust median apophysis, with anterior projection elongated and posterior projection conical (Fig. 8A, B).

*Female:* Unknown.

*Distribution:* North-eastern and south-eastern Brazil, States of Pernambuco and Minas Gerais.

*ISOCTENUS ORDINARIO* SP. NOV.  
(FIGS 9A–D, 19H, I)

*Ctenus sanguineus* Walckenaer, 1837; Mello-Leitão, 1936: 12, pl. I, fig. 24 (misidentification).

*Type material:* Male holotype and female paratype from Usina Hidrelétrica de Segredo, reservatório do Rio Jordão, Candói/Mangueirinha, Paraná, Brazil,

24.iv–4.v.1996, R. Bertani, deposited in IBSP 48358. Paratypes: 1 male from Jundiá, São Paulo, Brazil, 26.iv.2001, V. Merge, deposited in IBSP 27909; 1 female from Taboão da Serra, São Paulo, Brazil, 5.x.1997, F. Leirão, deposited in IBSP 14482; 1 male from São Paulo, São Paulo, Brazil, 9.ix.2003, A. Tranduta, deposited in IBSP 41295; 1 female from Piracaia, São Paulo, Brazil, 16.ix.1996, S. C. Castro Filho, deposited in IBSP 8507.

*Etymology:* The species epithet is a Portuguese noun meaning 'ordinary'.

*Additional material examined:* BRAZIL. Minas Gerais: Guaxupé, 1 female (IBSP 6421); Itapeva, 1 male (IBSP 11937). Rio de Janeiro: São Pedro da Aldeia, 1 female (MNRJ 136). São Paulo: Botucatu, 1 female (UBTU); Vargem Grande Paulista, 1 male (IBSP 6405); Piratininga, 1 male, 1 female (IBSP 34993); Pinhalzinho, 1 male (IBSP 6144); Piraju, Usina Hidrelétrica de Piraju, 1 male (IBSP 36291); Itatiba, 1 male (IBSP 27304); Bragança Paulista, 1 female (IBSP 8535); Tremembé, 2 males (IBSP 2645); Piracaia, 1 male (IBSP 39873); Itu, 1 male (IBSP 6450); Itapevi, 1 male (IBSP 6147); Jundiá, 1 female (IBSP 5835); São Roque, 4 males, 2 females (IBSP 4739); São Paulo, 3 male (IBSP 976; 27754; 39843); Araçariguama, 1 female (IBSP 29559); Cajamar, 1 male (IBSP 50889); Mairinque, 1 male (IBSP 8588); Mairiporã, 1 female (IBSP 6103); Biritiba Mirim, 1 male (IBSP 6087); Itapeçerica da Serra, 1 male (IBSP 8344); Nazaré Paulista, 1 male, 3 females (IBSP 8511); Ibiúna, 1 female (IBSP 43994); Tapiraí, 1 male (IBSP 20200). Paraná: Dois Vizinhos, Cruzeiro do Sul, 2 females (IBSP 21188, 21359); Candói/ Mangueirinha, Usina Hidrelétrica de Segredo, reservatório do Rio Jordão, 7 males, 20 females (IBSP 7197–7199; 7208; 7211; 7219; 48358); Curitiba, Barigüi, 1 female (IBSP 1024). Rio Grande do Sul: Derrubadas, Parque Estadual do Turvo, 1 male, 2 females (MCN 38808; 38809); Esmeralda, 1 female (MCN 2899); Arroio do Tigre, 1 male (MCN 7843). ARGENTINA. San Javier: Arroyo Guerrero, 1 male (MCTP 1295).

*Diagnosis:* *Isoctenus ordinario* sp. nov. resembles *I. taperae* comb. nov. by the morphology of the embolus and median apophysis in male palp (Fig. 9A), but can be distinguished by the elongated tibiae and the dorsal branch of RTA elongated with rounded tip and internal grooves in male palp (Fig. 9A, B) and by the median field with anterior margin deeply excavated in the epigynum (Fig. 9C).

*Description:* Male (IBSP 48358). Coloration as in *I. foliifer*. Total length 13.30. Carapace 7.20 long and 5.40 wide. Clypeus 0.32 high. Eye diameters: AME



0.38, ALE 0.26, PME 0.46, PLE 0.42. Leg measurements: I: femur 8.20/ patella 3.20/ tibia 8.90/ metatarsus 7.70/ tarsus 4.10/ total 32.10; II: 7.40/ 3.40/ 7.60/ 7.20/ 3.30/ 28.90; III: 6.50/ 2.80/ 6.50/ 6.90/ 3.00/ 25.70; IV: 8.60/ 3.10/ 8.30/ 10.60/ 3.70/ 34.30. Leg spination as in *I. foliifer*, except tibia I and II p1-1-0. Palp: tibia approximately same length as cymbium; RTA with ventral branch truncated; tibia with short and curved ventral apophysis (Fig. 9A, B). Cymbium with ventral retrolateral projection reduced and dorsal retrolateral projection rounded; short and laminar embolus, with bifid tip and short basal projection; robust median apophysis, with conical anterior and posterior projections (Figs 9A, B, 19H–I).

*Female* (IBSP 48358). Coloration as in *I. foliifer*. Total length 13.30. Carapace 7.20 long and 5.40 wide. Clypeus 0.32 high. Eye diameters: AME 0.38, ALE 0.26, PME 0.46, PLE 0.42. Leg measurements: I: femur 8.20/ patella 3.20/ tibia 8.90/ metatarsus 7.70/ tarsus 4.10/ total 32.10; II: 7.40/ 3.40/ 7.60/ 7.20/ 3.30/ 28.90; III: 6.50/ 2.80/ 6.50/ 6.90/ 3.00/ 25.70; IV: 8.60/ 3.10/ 8.30/ 10.60/ 3.70/ 34.30. Leg spination as in *I. foliifer*, except tibia I and II p1-1-0. Epigynum: rounded median field; lateral spurs short partially covered by the median field and with rounded tip (Fig. 9C). Spermathecae smooth, with rounded head and large base; ventral wall with a fold behind the spermathecae (Fig. 9D).

*Variation*: Ten males: total length 10.50–14.10, carapace 5.50–7.90, femur I 5.80–8.30; ten females: total length 14.50–18.80, carapace 7.00–8.90, femur I 6.30–8.00.

*Distribution*: South-eastern and southern Brazil, States of Minas Gerais, Rio de Janeiro, São Paulo, Paraná and Rio Grande do Sul, and north-eastern Argentina.

*ISOCTENUS EUPALAESTRUS* MELLO-LEITÃO, 1936  
(FIGS 10A–D, 19A)

*Isoctenus eupalaestrus* Mello-Leitão, 1936: 18, pl. 3, figs 39, 40 (male holotype and female paratype from Paranaguá, Paraná, Brazil, O. Leonardos, deposited in MNRJ 42271, examined); Bonnet, 1957: 2311; Platnick, 2008.

*Ctenus pauper* Mello-Leitão, 1947: 271, figs 26, 27 [only the female paralectotype deposited in MHCI 2520, designated by Pinto-da-Rocha & Caron (1989), examined]; Pinto-da-Rocha & Caron, 1989: 1026; Platnick, 2008.

*Additional material examined*: BRAZIL. São Paulo: Botucatu, 1 female, 1 male (UBTU); Iporanga, Parque Estadual Turístico do Alto Ribeira, 10 males, 4

females (IBSP); Mairiporã, 1 male (IBSP 6073); Sorocaba, 1 male (IBSP 11014).

*Diagnosis*: *Isoctenus eupalaestrus* resembles *I. segredo* sp. nov. by the embolus shape (Figs 10A, 19A) in male palp, but can be distinguished by the elongated dorsal branch of RTA, elongated dorsal projection of cymbium and robust median apophysis in male palp (Fig. 10A, B) and by the large median field and lateral spurs slender and elongated in the epigynum (Fig. 10C).

*Description*: *Male* (holotype). Coloration as in *I. foliifer*, except by a lighter arrow mark in abdomen dorsum. Total length 7.40. Carapace 4.10 long and 3.10 wide. Clypeus 0.08 high. Eye diameters: AME 0.17, ALE 0.12, PME 0.20, PLE 0.22. Leg measurements: I: femur 2.05/ patella 1.25/ tibia 3.05/ metatarsus 2.55/ tarsus 1.30/ total 10.20; II: 2.45/ 1.50/ 3.05/ 2.05/ 0.90/ 9.95; III: 2.90/ 1.25/ 2.45/ 2.75/ 1.55/ 10.90; IV: 3.90/ 1.40/ 3.60/ 4.35/ 1.40/ 14.65. Leg spination as in *I. foliifer*, except tibia I and II r0-1-1, metatarsus I r0-1-0, p1-1-0, II r0-1-1, p1-1-0. Palp: tibia short, approximately half cymbium length; RTA with ventral branch conical and dorsal branch slender and elongated with pointed tip and internal grooves; tibia with short and conical ventral apophysis (Fig. 10A, B). Cymbium with ventral retrolateral projection reduced; short and laminar embolus with rounded tip and robust basal projection; median apophysis with elongated anterior and posterior projection (Fig. 10A).

*Female* (IBSP). Coloration as in male. Total length 9.60. Carapace 4.70 long and 3.90 wide. Clypeus 0.12 high. Eye diameters: AME 0.20, ALE 0.18, PME 0.32, PLE 0.26. Leg measurements: I: femur 4.20/ patella 2.10/ tibia 3.80/ metatarsus 2.90/ tarsus 1.40/ total 14.40; II: 3.90/ 2.00/ 3.30/ 2.90/ 1.40/ 13.50; III: 3.50/ 1.80/ 2.50/ 3.20/ 1.30/ 12.30; IV: 4.50/ 1.90/ 4.20/ 5.00/ 1.80/ 17.40. Leg spination as in *I. foliifer*, except metatarsus IV r1-2-2, p1-1-1-1. Epigynum: median field with anterior margin smooth, posterior margin slightly projected and lateral margins rounded; lateral spurs not covered by the median field and with projected tip (Fig. 10C). Spermathecae with large head and rounded base; ventral wall with a fold covering part of the spermathecae (Fig. 10D).

*Variation*: Ten males: total length 7.20–9.00, carapace 4.10–4.80, femur I 3.90–4.50; five females: total length 9.50–11.00, carapace 4.00–4.80, femur I 3.30–4.50.

*Distribution*: South-eastern and southern Brazil, States of São Paulo and Paraná.

***ISOCTENUS SEGREDO* SP. NOV.** (FIG. 11A–D)

*Type material:* Male holotype from Usina Hidrelétrica de Segredo, Reservatório do Rio Jordão, Candói/Mangueirinha, Paraná, Brazil, 3.v.1996, R. Bertani, deposited in IBSP 7227. Paratypes: 1 female from the same locality and collector as holotype, 24.iv–4.v.1996, deposited in IBSP 58386; 1 male and 1 female from the same locality and collector as holotype, 24.iv–4.v.1996, deposited in IBSP 58387.

*Additional material examined:* BRAZIL. Paraná: Candói/Mangueirinha, Usina Hidrelétrica de Segredo, Reservatório do Rio Jordão, 2 male, 6 females (IBSP 7201–7203, 8034).

*Etymology:* The species epithet is a toponym in apposition and it is a Portuguese noun meaning ‘secret’.

*Diagnosis:* *Isoctenus segredo* sp. nov. resembles *I. charada* sp. nov. by the morphology of the RTA in male palp (Fig. 11A, B), but can be distinguished by the short and slender median apophysis and the basal projection of embolus short in male palp (Fig. 11A) and by the subquadrangular median field, large lateral spurs and spermathecae with a reduced head and large base in the epigynum (Fig. 11C, D).

*Description:* *Male* (holotype). Coloration as in *I. foliifer*, except carapace with longitudinal lighter stripe from the eyes to the posterior margin and a lighter arrow mark on abdomen dorsum. Total length 9.80. Carapace 5.40 long and 3.90 wide. Clypeus 0.12 high. Eyes diameters: AME 0.18, ALE 0.14, PME 0.26, PLE 0.24. Leg measurements: I: femur 4.00/ patella 2.10/ tibia 4.40/ metatarsus 3.70/ tarsus 1.90/ total 16.10; II: 4.00/ 1.80/ 3.80/ 3.20/ 1.50/ 14.30; III: 3.60/ 1.60/ 3.40/ 3.20/ 1.50/ 13.30; IV: 4.80/ 1.90/ 4.80/ 5.00/ 1.90/ 18.40. Leg spination as in *I. foliifer*, except metatarsus I and II r1-1 p1-1. Palp: tibia short, approximately half of the cymbium length; RTA with ventral branch conical and dorsal branch short and robust with internal grooves; tibia with short and curved ventral apophysis (Fig. 11A, B). Cymbium with conical ventral retrolateral projection and short dorsal retrolateral projection; short and laminar embolus with rounded tip; median apophysis with anterior and posterior projections short and conical (Fig. 11A).

*Female* (IBSP 58386). Coloration as in male. Total length 12.30. Carapace 5.00 long and 4.10 wide. Clypeus 0.20 high. Eye diameters: AME 0.18, ALE 0.20, PME 0.26, PLE 0.24. Leg measurements: I: femur 4.00/ patella 2.20/ tibia 3.80/ metatarsus 3.00/ tarsus 1.40/ total 14.40; II: 3.90/ 1.80/ 3.60/ 2.80/ 1.40/ 13.50; III: 3.50/ 1.40/ 2.80/ 3.00/ 1.30/ 12.00; IV: 4.70/

1.90/ 4.50/ 5.10/ 1.80/ 18.00. Leg spination as in *I. foliifer*, except tibia II p1-1. Epigynum: median field with anterior margin smooth and posterior margin slightly projected; lateral spurs not covered by the median field and with rounded tip (Fig. 11C). Ventral wall with a fold covering part of the spermathecae (Fig. 11D).

*Variation:* Three males: total length 8.30–8.90, carapace 4.40–4.60, femur I 4.00–4.10; seven females: total length 9.80–13.50, carapace 4.70–5.40, femur I 3.80–4.20.

*Distribution:* Southern Brazil, State of Paraná.

***ISOCTENUS CHARADA* SP. NOV.** (FIG. 12A–D)

*Type material:* Male holotype from Usina Hidrelétrica de Segredo, Reservatório do Rio Jordão, Candói/Mangueirinha, Paraná, Brazil, 24.iv–4.v.1996, R. Bertani, deposited in IBSP 52464; Paratypes: 1 male and 1 female with the same data as holotype, deposited in IBSP 52463.

*Additional material examined:* None.

*Etymology:* The species epithet is a Portuguese noun meaning ‘charade’.

*Diagnosis:* *Isoctenus charada* sp. nov. resembles *I. segredo* sp. nov. by the morphology of the RTA in male palp (Fig. 12A, B), but can be distinguished by the robust median apophysis with elongated anterior projection and the basal projection of embolus large and curved in male palp (Fig. 12A) and by the short and large median field, slender lateral spurs and spermathecae with a head and base large in the epigynum (Fig. 12C, D).

*Description:* *Male* (holotype). Coloration as in *I. segredo*. Total length 8.90. Carapace 4.80 long and 3.30 wide. Clypeus 0.20 high. Eye diameters: AME 0.16, ALE 0.20, PME 0.23, PLE 0.22. Leg measurements: I: femur 4.00/ patella 1.80/ tibia 3.80/ metatarsus 3.30/ tarsus 1.60/ total 14.50; II: 3.70/ 1.80/ 3.80/ 3.30/ 1.60/ 13.00; III: 3.30/ 1.70/ 2.70/ 3.10/ 1.30/ 12.10; IV: 4.50/ 1.70/ 3.80/ 4.20/ 1.70/ 15.90. Leg spination as in *I. foliifer*, except metatarsus I and II r0-1-0, p1-1-0. Palp: tibia short, approximately half cymbium length; RTA with conical ventral branch and short and robust dorsal branch with internal grooves; tibia with elongated ventral apophysis (Fig. 12A, B). Cymbium with conical ventral retrolateral projection and truncated dorsal retrolateral projection; short and laminar embolus with rounded tip; median apophysis with rounded posterior projection (Fig. 12A).

*Female* (IBSP 52463). Coloration as in *I. segredo*. Total length 9.50. Carapace 4.40 long and 3.30 wide. Clypeus 0.16 high. Eye diameters: AME 0.18, ALE 0.18, PME 0.24, PLE 0.21. Leg measurements: I: femur 3.20/ patella 1.60/ tibia 2.70/ metatarsus 2.30/ tarsus 1.00/ total 10.80; II: 3.00/ 1.60/ 2.40/ 2.30/ 1.00/ 10.30; III: 2.70/ 1.40/ 2.00/ 2.40/ 0.90/ 9.40; IV: 3.40/ 1.50/ 3.00/ 3.80/ 1.30/ 13.00. Leg spination as in *I. foliifer*, except metatarsus III p1-1-1-1. Epigynum: median field with anterior margin slightly excavated and lateral margins rounded; lateral spurs not covered by the median field and with projected tip (Fig. 12C). Ventral wall with a fold covering part of the spermathecae (Fig. 12D).

*Variation*: Two males: total length 8.50–8.90.

*Distribution*: Southern Brazil, State of Paraná.

*ISOCTENUS HERTELI* (MELLO-LEITÃO, 1947)  
COMB. NOV. (FIG. 13A–D)

*Ctenus herteli* Mello-Leitão, 1947, fig. 24 (female holotype from Volta Grande, Piraquara, Paraná, Brazil, ii.1945, R. Hertel, deposited in MHCI 2476, examined); Pinto-da-Rocha & Caron, 1989: 1026; Platnick, 2008.

*Ctenus mourei* Mello-Leitão, 1947, fig. 25 [male lectotype and male paralectotype from Barigüi, Curitiba, Paraná, Brazil, R. B. Lange, deposited in MHCI 2517 and 2516, designated by Pinto-da-Rocha & Caron (1989), examined]; Pinto-da-Rocha & Caron, 1989: 1026; Platnick, 2008. Syn. nov.

*Additional material examined*: BRAZIL. Paraná: Curitiba, Barigüi, 2 males (MHCI 1003, 1017–1023); 1 male (IBSP); Piraquara (Volta Grande), 1 female (MHCI 2223); (Banhado), 1 female (IBSP); 1 male, 1 female (MNRJ 13421).

*Diagnosis*: *Isoctenus herteli* comb. nov. resembles *I. minusculus* comb. nov. by the morphology of the embolus in male palp (Fig. 13A), but can be distinguished by the short tibia, ventral branch of RTA truncate, dorsal branch of RTA short and robust, and robust and large median apophysis with elongated anterior projection in male palp (Fig. 13A, B) and by the short and large median field and spermathecae with a robust head in the epigynum (Fig. 13C, D).

*Description*: *Male* (MHCI 2516). Coloration as in *I. foliifer*. Total length 8.80. Carapace 4.70 long and 3.70 wide. Clypeus 0.18 high. Eye diameters: AME 0.14, ALE 0.20, PME 0.24, PLE 0.21. Leg measurements: I: femur 4.60/ patella 2.00/ tibia 4.50/ metatarsus 4.10/ tarsus 1.90/ total 17.10; II: 4.20/ 1.90/ 3.60/ 3.60/ 1.60/

14.90; III: 3.60/ 1.60/ 3.00/ 3.50/ 1.40/ 13.10; IV: 4.50/ 1.80/ 4.20/ 5.50/ 2.00/ 18.00. Leg spination as in *I. foliifer*, except tibia I and II p1-1-0, metatarsus I and II r1-1-0, p-1-1-0. Palp: tibia approximately half cymbium length; tibia with large ventral apophysis (Fig. 13A, B). Cymbium with short and rounded ventral and dorsal retrolateral projection (Fig. 13B); short and laminar embolus with hooked tip and basal projection short and robust; median apophysis with rounded posterior projection (Fig. 13A).

*Female* (holotype). Coloration as in *I. foliifer*. Total length 12.80. Carapace 6.40 long and 4.90 wide. Clypeus 0.26 high. Eye diameters: AME 0.22, ALE 0.20, PME 0.40, PLE 0.30. Leg measurements: I: femur 5.10/ patella 2.50/ tibia 5.40/ metatarsus 3.90/ tarsus 1.60/ total 18.50; II: 4.80/ 2.50/ 4.40/ 3.70/ 1.60/ 17.00; III: 4.30/ 2.10/ 3.60/ 3.70/ 1.60/ 15.30; IV: 5.50/ 2.40/ 5.10/ 5.80/ 1.90/ 20.70. Leg spination as in *I. foliifer*. Epigynum: median field with anterior margin smooth; slender lateral spurs not covered by the median field and with slightly projected tip (Fig. 13C). Spermathecae with large head and reduced base; ventral wall with a fold covering part of the spermathecae (Fig. 13D).

*Variation*: Four males: total length 8.50–9.50, carapace 4.50–5.00, femur I 4.20–4.70; two females: total length 9.00–12.70, carapace 4.50–5.70, femur I 4.00–4.60.

*Distribution*: Southern Brazil, State of Paraná.

*ISOCTENUS MINUSCULUS* (KEYSERLING, 1891)  
COMB. NOV. (FIGS 14A–D, 19B)

*Ctenus minusculus* Keyserling, 1891: 149, pl. 5, fig. 102 (female holotype from Rio Grande, Rio Grande do Sul, Brazil, 1.vii.1890, E. Keyserling, deposited in BMNH 2915, examined); Pickard-Cambridge, 1897: 65, 77; Pickard-Cambridge, 1902: 411; Mello-Leitão, 1936: 3, 11, pl. 1 fig. 16, pl. 2 figs 17, 18; Mello-Leitão, 1947: 270; Bonnet, 1956: 1285; Platnick, 2008.

*Additional material examined*: BRAZIL. Rio Grande do Sul: 1 male, 3 females (MNRJ 41666); Sobradinho, 1 female (MCN 3797); Farroupilha, 1 female (MCN 8303); São Francisco de Paula, 1 female (MCN 1669); Caxias do Sul, 1 female (MCN 1667); Canela, 1 female (MCN 12361); Triunfo, 1 female (MCN 7318); Porto Alegre, 1 female (MCN 14401); 1 female (MCTP 3908); (Reserva Biológica do Lami), 1 male, 1 female (MCTP 411); 1 male (MCN 4227), all collected by A. A. Lise; Guaíba, 1 female (MCTP 6072); 1 female (MCN 2289); Montenegro, 1 female (MCN 6072); Osório, 1 male (MCN 1900); Viamão, 1 female (MCTP 6215);

(Médio Arroio Pesqueiro, 30°09'S 50°57'W), 1 male, 1 female (MCN 33184); (Passo do Vigário), 1 male (MCTP 3224); (Morro do Coco), 1 male (MCN 11283).

*Diagnosis:* *Isoctenus minusculus* comb. nov. resembles *I. herteli* comb. nov. by the morphology of the embolus (Fig. 14A) in male palp, but can be distinguished by the long and thin tibia, ventral branch of RTA short and laminar, dorsal branch of RTA short and thin with rounded tip and internal grooves and robust median apophysis in male palp (Fig. 14A, B) and by the median field with a median area rounded and elevated, lateral spurs short and laminar and spermathecae smooth with a small head in the epigynum (Fig. 14C, D).

*Description: Male* (MCTP 3224). Coloration as in *I. segredo*. Total length 8.70. Carapace 4.60 long and 3.40 wide. Clypeus 0.18 high. Eye diameters: AME 0.16, ALE 0.16, PME 0.24, PLE 0.20. Leg measurements: I: femur 4.40/ patella 1.90/ tibia 4.10/ metatarsus 3.90/ tarsus 2.10/ total 16.40; II: 3.90/ 1.80/ 3.40/ 3.30/ 1.70/ 14.10; III: 3.60/ 1.60/ 3.00/ 3.30/ 1.50/ 13.00; IV: 4.70/ 1.80/ 4.30/ 5.20/ 2.00/ 18.00. Leg spination as in *I. foliifer*, except tibia II r0-1-0, metatarsus I and II r0-1-0, p1-1-0. Palp: tibia short, approximately two-thirds cymbium length with short and curved ventral apophysis (Fig. 14A, B). Cymbium with reduced ventral retrolateral projection and short dorsal retrolateral projection (Fig. 14B); embolus short and laminar with hooked tip and basal projection short and curved (Fig. 19B); median apophysis with conical anterior and posterior projection (Fig. 14A).

*Female* (MCTP 6072). Coloration as in *I. segredo*. Total length 13.30. Carapace 6.80 long and 5.00 high. Clypeus 0.24 high. Eye diameters: AME 0.23, ALE 0.22, PME 0.30, PLE 0.30. Leg measurements: I: femur 5.20/ patella 2.70/ tibia 4.70/ metatarsus 4.00/ tarsus 1.80/ total 18.40; II: 4.80/ 2.60/ 4.00/ 3.60/ 1.80/ 16.80; III: 4.50/ 2.10/ 3.50/ 3.80/ 1.80/ 15.70; IV: 5.70/ 2.40/ 5.00/ 6.10/ 2.20/ 21.40. Leg spination as in *I. foliifer*, except tibia II p0-1-0. Epigynum: oval median field, with anterior margin slightly excavated and posterior margin rounded; lateral spurs not covered by the median field and partially projected over the median field (Fig. 14C). Spermathecae with a small head and large base; ventral wall with a slight fold behind the spermathecae (Fig. 14D).

*Variation:* Ten males: total length 7.40–8.50, carapace 4.20–4.50, femur I 4.00–4.30; ten females: total length 8.60–11.30, carapace 3.40–5.40, femur I 2.80–4.50.

*Distribution:* Southern Brazil, State of Rio Grande do Sul.

*Isoctenus strandi* MELLO-LEITÃO, 1936  
(FIGS 15A–D, 19C)

*Isoctenus strandi* Mello-Leitão, 1936: 20, pl. 2 fig. 43 (female holotype from Paranaguá, Paraná, Brazil, O. Leonardos, deposited in MNRJ 41185, currently MNRJ 41875, examined); Mello-Leitão, 1936: 18; Mello-Leitão, 1947: 272; Bonnet, 1957: 2312; Platnick, 2008.

*Ctenus pauper* Mello-Leitão, 1947: 271, figs 26, 27 [females lectotype and paralectotype from Barigüi, Curitiba, Paraná, Brazil, x.1944, R. B. Lange, deposited in MHCI 2518 and 2519, designated by Pinto-da-Rocha & Caron (1989), examined]; Pinto-da-Rocha & Caron, 1989: 1026; Platnick, 2008. Syn. nov.

*Ctenus mourei* Mello-Leitão, 1947, fig. 25 [only male paralectotype from, Barigüi, Curitiba, Paraná, Brazil, R. B. Lange, deposited in MHCI 2445, designated by Pinto-da-Rocha & Caron (1989), examined]. Pinto-da-Rocha & Caron, 1989: 1026; Platnick, 2008.

*Additional material examined:* BRAZIL. São Paulo: Cananéia, Ilha do Cardoso, 1 male, v.2000, G. Machado (IBSP 38103). Paraná: Cândói/Mangueirinha, Usina Hidrelétrica de Segredo, Reservatório do Rio Jordão, 4 males (IBSP 7225, 7228, 11018); Pinhão, 1 female (MCN 22216); Curitiba, 2 female (MHCI 1407, 2071); (Barigüi), 1 female (MHCI, 1960); (Instituto Florestal), 1 male, 1 female (MHCI 2921–2922); Morretes, Parque Estadual Pico do Marumbi, 2 males, 5 females (IBSP 7310, 7311, 7313–7315, 7317, 7335); 1 male (MHCI 3533–3534); Matinhos, Caiobá, 2 female (MHCI 1963, 992); Tijucas do Sul, Lagoa, 6 males, 8 females (IBSP 39108, 39138, 39148, 39150, 39226, 39241, 39244); Telêmaco Borba, 3 females (IBSP 6567). Santa Catarina: Mafra, Avencal, 2 males, 2 females (MHCI 1843–1848).

*Diagnosis:* *Isoctenus strandi* resembles *I. malabaribus* by the morphology of tibia and presence of two small apical spines in male palp (Fig. 15A, B) and morphology of the spermathecae in the epigynum (Fig. 15D), but can be distinguished by the ventral and dorsal branches of RTA large and robust (Fig. 15A, B), short embolus (Fig. 19C) and slender median apophysis in male palp (Fig. 15A) and by the subquadrangular median field in the epigynum (Fig. 15C).

*Description: Male* (MHCI 2921). Coloration as in *I. foliifer*, except a lighter arrow mark in abdomen dorsum. Total length 9.90. Carapace 5.40 long and 4.50 wide. Clypeus 0.22 high. Eye diameters: AME 0.19, ALE 0.18, PME 0.24, PLE 0.26. Leg measurements: I: femur 5.00/ patella 2.30/ tibia 5.10/ metatarsus 4.80/ tarsus 2.10/ total 19.30; II: 4.90/ 2.20/ 4.20/ 4.30/ 1.80/ 17.30; III: 4.30/ 1.90/ 3.50/ 4.40/ 1.70/

15.80; IV: 5.50/ 2.10/ 5.00/ 6.60/ 2.20/ 21.40. Leg spination as in *I. foliifer*, except tibia II r0-1-0; metatarsus I and II r1-1-0, p1-1-0. Palp: tibia short, approximately half cymbium length; short ventral apophysis (Fig. 15A, B). Cymbium with conical ventral and dorsal retrolateral projection (Fig. 15B). Embolus with hooked tip and basal projection short and curved; median apophysis with elongated anterior projection and robust posterior projection (Fig. 15A).

*Female* (holotype). Coloration as in *I. foliifer*. Total length 12.80. Carapace 6.60 long and 5.00 wide. Clypeus 0.18 high. Eye diameters: AME 0.24, ALE 0.16, PME 0.27, PLE 0.22. Leg measurements: I: femur 5.20/ patella 2.90/ tibia 5.50/ metatarsus 4.20/ tarsus 1.60/ total 19.40; II: 5.10/ 2.60/ 4.90/ 3.90/ 1.60/ 18.10; III: 4.50/ 2.10/ 3.70/ 4.20/ 1.50/ 16.00; IV: 6.00/ 2.40/ 5.20/ 5.10/ 1.70/ 20.40. Leg spination as in *I. foliifer*, except tibia II p0-1-0. Epigynum: median field with anterior margin slightly excavated; lateral spurs robust not covered by the median field and with a rounded tip (Fig. 15C). Spermathecae with large head and small and projected base; ventral wall slightly elevated (Fig. 15D).

*Variation*: Ten males: total length 7.20–9.50, carapace 4.00–5.10, femur I 3.30–4.50; ten females: total length 10.60–13.10, carapace 4.50–5.80, femur I 3.50–4.80.

*Distribution*: South-eastern and southern Brazil, States of São Paulo, Paraná and Santa Catarina.

*ISOCTENUS MALABARIS* POLOTOW *ET AL.*, 2007  
(FIG. 19D)

*Isoctenus malabaris* Polotow *et al.*, 2007: 216, figs 1–5 (male holotype and female paratype from Centro de Pesquisas e Conservação da Natureza Pró-Mata (29°28'21"S, 50°09'25"W), São Francisco de Paula, Rio Grande do Sul, Brazil, 02.i.2001, R. Ott, deposited in MCN 39321, examined; paratypes with same data as holotype: 3 males and 3 females, deposited in IBSP 51957, 51958; MCTP 17142, 17143; MZSP 25327, 25328, examined). Platnick, 2008.

*Additional material examined*: None.

*Diagnosis*: *Isoctenus malabaris* resembles *I. strandi* by the morphology of tibia and presence of two small apical spines in male palp (Polotow *et al.*, 2007, figs 1, 2) and morphology of the spermathecae in the epigynum (Polotow *et al.*, 2007, figs 3–5), but can be distinguished by conical ventral branch of RTA, slender dorsal branch of RTA, elongated embolus (Fig. 19D) and robust median apophysis in male palp (Polotow *et al.*, 2007, figs 1, 2) and by the oval median field

projected posteriorly and short lateral spurs in the epigynum (Polotow *et al.*, 2007, figs 3–5).

*Description*: Male and female are described in Polotow *et al.* (2007, figs 1–5).

*Distribution*: Southern Brazil, State of Rio Grande do Sul.

**GENUS *PARABATINGA* GEN. NOV.**

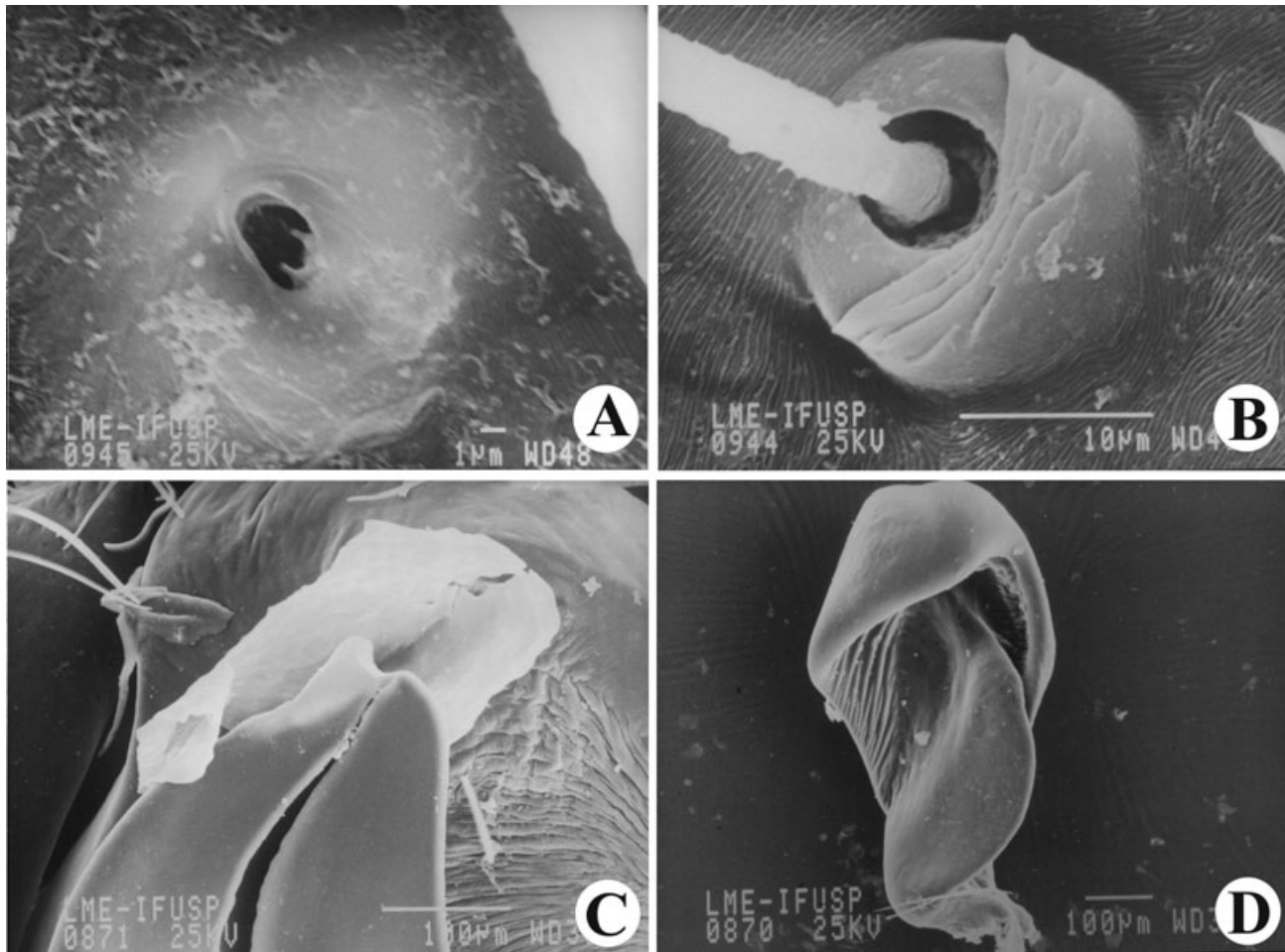
(FIGS 16, 17, 20C)

*Type species*: *Parabatinga brevipes* (Keyserling, 1891) comb. nov.

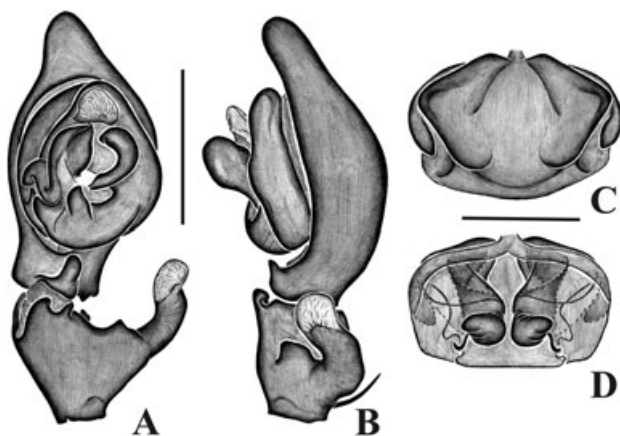
*Etymology*: The species epithet is a Tupi noun 'paraba' means spot and 'tinga' means white, and refers to the white spots in ventral abdomen.

*Diagnosis*: *Parabatinga* gen. nov. is distinguished from other Cteninae genera by the dorsal branch of RTA with hyaline tip (Fig. 17A, B), embolus with distal hyaline projection (Fig. 16C) and median apophysis with a prolateral laminal process (Fig. 16D). Females of *Parabatinga* gen. nov. are distinguished by spermathecae oval and dorsally projected (Fig. 17D).

*Description*: Medium-sized ecribellate spiders. Total body length (males and females): 10.20–22.35. Carapace piriform. Thoracic groove longitudinal. Chilum divided. Eyes: ctenoid pattern 2-4-2, with the anterior and posterior row recurved in dorsal view. Clypeus with long, erect black bristles. Clypeus high proportional to AME diameter. Eyes round, except the anterior lateral oval. Chelicerae promargin of fang furrow with three teeth, the median almost twice as high as the laterals; retromargin with three similar sized teeth; intermarginal denticles present between pro- and retromarginal teeth. Endites three times labium length, with external lateral margin excavated, distally truncate. Subapical serrula. Labium short, as long as wide, with rounded tip bearing dense apical scopula. Sternum oval, not extending between legs IV. Leg formula 4123. Trochanters deeply notched. Ventral scopula on tarsi and metatarsi dense in females and light in males. Tibiae I and II with five pairs of ventral spines and metatarsi I and II with tree pairs of ventral spines. Smooth tarsal organ with rounded aperture and a distal fold (Fig. 16A). Rounded trichobothria with four transverse grooves (Fig. 16B). Tarsi with two pectinate claws and dense claw tufts. Female pedipalp claw pectinate with three elongated teeth (Fig. 20C). Abdomen oval with numerous dorsal erect black bristles.

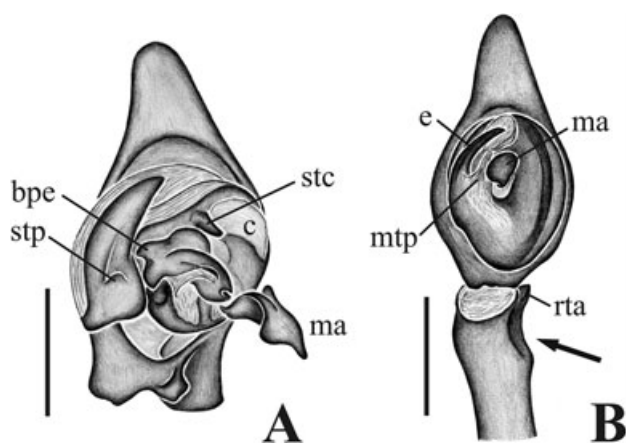


**Figure 16.** *Parabatinga brevipes* comb. nov.: A, tarsal organ; B, trichobothria; C, hyaline projection of embolus; D, dorsal view of the median apophysis.



**Figure 17.** *Parabatinga brevipes* comb. nov.: A, male palp, ventral view; B, male palp, retrolateral view; C, epigynum, ventral view; D, epigynum dorsal view. Scale bars: 1.00 mm.

*Male palp:* Tibia short, approximately half cymbium length; RTA divided in ventral branch short and conical and dorsal branch sinuous and elongated with rounded and hyaline tip; ventrobasal depression of cymbium to accommodate the ventral tibial apophysis short and curved (Fig. 17A, B). Cymbium elongated, distally coniform and proximally subrectangular; ventrobasal depression of cymbium delimited retrolaterally by a voluminous and ventrobasally projected fold (Fig. 17A, B); tegulum oval, with prolateral depression to accommodate the embolus and with a large hyaline area, at median apophysis and embolus base, divided by a short and large sclerotized area (Fig. 17B); embolus short and large, with a basal prolateral projection that notches on to a depression on the subtegulum (locking lobes *sensu* Griswold, 1993) (Fig. 17A); median apophysis robust, prolaterally excavated and retrolaterally convex (cup-shaped *sensu* Griswold, 1993) (Fig. 17A); conductor laminar, short and hyaline, not involving the tip of embolus



**Figure 18.** Male palp, ventral view: A, partially expanded palp of *Isoctenus coxalis*. Abbreviations: bpe, basal prolateral projection of embolus; ma, median apophysis; stc, sclerotized tegular projection of conductor base; stp, subtegulum projection. Scale bar: 0.50 mm. B, male palp of *Enoploctenus cyclothorax* (arrow pointed the basal depression of RTA). Abbreviations: e, embolus; ma, median apophysis; mtp, membranous tegular projection; rta, retrolateral tibial apophysis. Scale bar: 1.00 mm.

(Fig. 16C); subtegulum well developed and prolaterally positioned, with approximately one-third tegulum area; median area of the subtegulum with a depression limited by a basal projection, to notch on to the basal prolateral projection of the embolus (Fig. 17A).

**Epigynum:** Divided into median and lateral fields, which bear lateral spurs; median field with anterior margin deeply excavated, rounded posterior margin and projected lateral margins; lateral projections positioned anteriorly and prolonged as an internal wall, partially visible in ventral view; copulatory openings situated anteriorly (Fig. 17C). Copulatory ducts short, covered by a ventral wall; fertilization ducts short, originating from basal area of the spermathecae (Fig. 17D).

**Composition:** Only the type species, *P. brevipes*.

*PARABATINGA BREVIPES* (KEYSERLING, 1891)  
COMB. NOV. (FIGS 16, 17, 20C)

*Ctenus brevipes* Keyserling, 1891: 148, fig. 101 (female holotype from Rio Grande do Sul, Brazil, 1.vii.1890, R. von Ihering, deposited in BMNH 2914, examined); Pickard-Cambridge, 1897: 65, 77; Pickard-Cambridge, 1902: 411; Strand, 1909b: 410; Mello-Leitão, 1936: 7; Mello-Leitão, 1947: 270; Bonnet, 1956: 1276; Platnick, 2008.

*Ctenus taeniatus* Keyserling, 1891: 151, fig. 104 (male holotype from Rio Grande, Rio Grande do Sul,

Brazil, 1.vii.1890, R. von Ihering, deposited in BMNH 2912, examined); Pickard-Cambridge, 1897: 65, 74; Pickard-Cambridge, 1902: 413; Mello-Leitão, 1936: 3, 5, 13; Bonnet, 1956: 1290; Eickstedt, 1977: 213; Simó & Brescovit, 2001; Platnick, 2008. Syn. nov.

*Ctenus thomasi* Pickard-Cambridge, 1902: 403, figs 1, 2 (female holotype from La Plata, Argentina, 11.x.1897, O. Thomas, deposited in BMNH 122, not examined); Pickard-Cambridge, 1902: 411, 413; Mello-Leitão, 1933: 47; Eickstedt, 1977: 213 (syn.); Bonnet, 1956: 1291; Platnick, 2008.

*Ctenus tatarandensis* Tullgren, 1905: 48, pl. 7 fig. 22 (female holotype from Tatarenda, Bolívia, B. E. Nordenskiöld, deposited in SMNH, examined); Bonnet, 1956: 1291; Platnick, 2008. Syn. nov.

*Ctenus anisitsi* Strand, 1909a: 311 (female holotype from Villa Sana, Paraguay, 19.i.1903, J. D. Anisits, deposited in ZMB, examined); Bonnet, 1956: 1275; Platnick, 2008. Syn. nov.

*Ctenus atrivulvus* Strand, 1909a: 314 (female holotype from Bahia, Brazil, deposited in ZMB, examined); Bonnet, 1956: 1275; Platnick, 2008. Syn. nov.

*Ctenus mentor* Strand, 1909a: 315 (female holotype from Santa Catarina, Brazil, deposited in ZMB, examined); Bonnet, 1956: 1285; Platnick, 2008. Syn. nov.

*Ctenus brevipes brevilabris* Strand, 1909b: 410 (female holotype from Teresópolis, Rio de Janeiro, Brazil, deposited in ZMB 30718, examined); Bonnet, 1956: 1276; Platnick, 2008. Syn. nov.

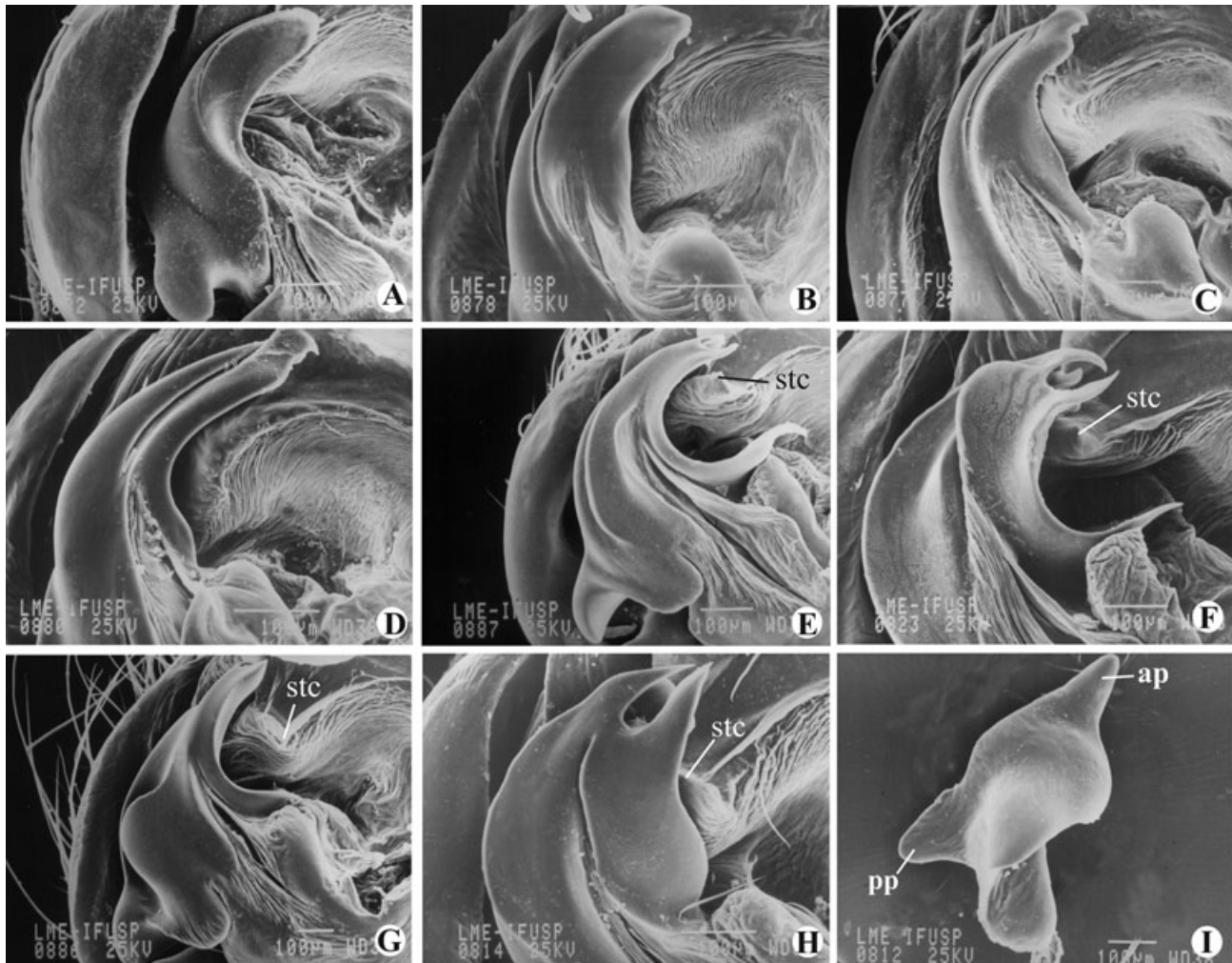
*Ctenus binotatus* Mello-Leitão, 1936: 6, pl. 1 fig. 2 (female holotype from Terenos, Mato Grosso do Sul, Brazil, deposited in IBSP 152, currently IBSP 424, examined); Mello-Leitão, 1936: 5; Eickstedt, 1977: 213 (syn.); Bonnet, 1956: 1276; Platnick, 2008.

*Ctenus gynheraldicus* Mello-Leitão, 1936: 8, pl. 1 fig. 9 (female holotype from São Paulo, São Paulo, Brazil, 19.viii.1935, O. J. Batista, deposited in IBSP 181, not examined, lost); Mello-Leitão, 1936: 5; Lehtinen, 1967: 254; Eickstedt, 1977: 213 (syn.); Bonnet, 1956: 1282; Platnick, 2008.

*Ctenus albovittatus* Mello-Leitão, 1939: 74, figs 56–58 (male holotype from Leones, Córdoba, Argentina, Bleek-Heitz, deposited in NMB 1166a, examined); Eickstedt, 1977: 213 (syn.); Bonnet, 1956: 1274; Platnick, 2008.

*Isoctenus masculus* Mello-Leitão, 1939: 527, figs 9, 10 (male holotype from Lagoa do Peri, Florianópolis, Santa Catarina, Brazil, 16.ix.1936, V. Sesconetto, deposited in IBSP 984, examined); Bonnet, 1957: 2312; Platnick, 2008. Syn. nov.

*Ctenus birabeni* Mello-Leitão, 1941: 157, pl. VIII fig. 35 (immature holotype from Juramento, Salta, Argentina, deposited in MLP 14822, examined); Platnick, 2008. Syn. nov.

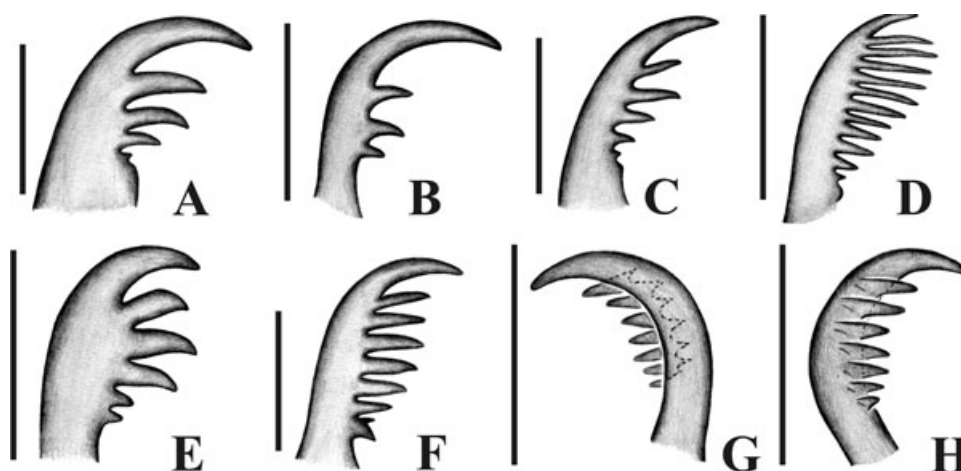


**Figure 19.** A–H. Embolus: A, *Isoctenus eupalaestrus*; B, *I. minusculus* comb. nov.; C, *I. strandi*; D, *I. malabaricus*; E, *I. foliifer*; F, *I. coxalis*; G, *I. janeirus*; H, *I. ordinario* sp. nov.; I, median apophysis of *Isoctenus ordinario* sp. nov., dorsal view.

*Additional material examined:* COLOMBIA. *Meta:* Puerto Lleros, Lomalinda, 73°22'W, 3°18'N, 2 male (CAS); San Ignacio, 3 females (IBSP 4893). BRAZIL. *Pará:* Serra Norte, 1 male (MPEG); *Tocantins:* Palmas, 1 female (MCN 22617). *Maranhão:* Balsas, 1 female, 1 male (IBSP 36595, 36597). *Sergipe:* São Cristóvão, Campus UFSE, 1 female (IBSP 10383); Santa Luzia do Itanhi, Mata do Crasto, 1 female (IBSP 10162). *Mato Grosso:* Nova Mutum, 1 male (IBSP 29530). *Goiás:* Niquelândia, Área U.H.E., Serra da Mesa, Margem esquerda do Rio Bagagem, 14°01'S, 48°18'W, 2 males (IBSP 6268); Mineiros, Parque Nacional das Emas, 1 female (IBSP 9527); Catalão, 2 males (IBSP 26243). *Distrito Federal:* Brasília, 1 male, 8 females (IBSP 2806, 2807, 2808, 2809, 2810, 2813, 2814, 2815). *Bahia:* Paulo Afonso, Raso da Catarina, 2 males (IBSP 7255, 7256); Barro Alto, 1 female (IBSP 159); Nova Redenção, 1 female (IBSP

20978); Cachoeira, 1 female (IBSP 3416); Porto Seguro, 4 males (IBSP 4222). *Mato Grosso do Sul:* Corumbá, 1 male, 3 females (IBSP 20573, 20575, 20577); Camapuã, 3 females (IBSP 2349); Terenos, 1 female (IBSP 1051); Paranaíba, 1 male, 2 females (IBSP 6551, 6553, 6554); Dourados, 1 male (IBSP 4969); Bodoquena, Serra da Bodoquena, 1 female (IBSP 33024); Bataguassú, Fazenda Orelha de Onça, 1 female (IBSP 35419). *Minas Gerais:* João Pinheiro, 1 female (IBSP 8519); Santana do Riacho, Serra do Cipó, 2 females (IBSP 8361, 8365); Uberaba, 1 male, 28.VIII.1968 (MHCI 4298); Indianópolis, 1 male, 1 female (IBSP 7631); Fronteira, 1 female (IBSP 3561); Santa Bárbara, Parque Nacional da Serra da Caraça, 1 male (IBSP 7423); Poços de Caldas, 1 female (IBSP 5257). *Espírito Santo:* São Mateus, Reserva Florestal Vale do Rio Doce, 2 males (IBSP 12748, 12763); São José do Calçado, Rio Itabapuana, Usina Hidrelétrica





**Figure 20.** Female tarsal claw. A, *Ancylometes concolor*; B, *Enoploctenus cyclothorax*; C, *Parabatinga brevipes* comb. nov.; D, *Isoctenus coxalis*; E, *Ctenus dubius*; F, *Phoneutria nigriventer*. G–H, proteral male claw of *Africactenus evadens*, leg I: G, proteral view; H, retrolateral view.

do Rosal, 1 female (IBSP 26452). *Rio de Janeiro*: Rio de Janeiro, 1 female, 2 males (MNRJ 388, 674). *São Paulo*: Pereira Barreto, Usina Hidrelétrica de Três Irmãos, 6 males, 1 female (IBSP 4855); Dobrada, 1 female (IBSP 4234); Itapira, 1 male (IBSP 3204); Maracaí, 1 female (IBSP 5513); Monte Mor, 2 males (IBSP 2704); Rancharia, 1 female (IBSP 3472); São Carlos, 1 male (IBSP 3206); Águas de Santa Bárbara, 1 male, 2 females (IBSP 6964, 6969); Pinhalzinho, 1 male (IBSP 20131); Piracaia, 1 female (IBSP 7410); Vinhedo, 1 female (IBSP 24066); Assis, 1 male (IBSP 4227); Itupeva, 1 female (IBSP 3614); Jundiaí, 2 males (IBSP 14445); Sorocaba, 1 male (IBSP 6399); São Paulo, 5 females, 1 male (IBSP 1382); Ibiúna, 1 female (IBSP 2712); Igaratá, 1 male (IBSP 20417); Miracatu, 1 female (IBSP 3697). *Paraná*: Ponta Grossa, 1 female (IBSP 24039). *BOLIVIA. La Paz*: Rio Blanco, 1 female (IBSP 4699). *Santa Cruz*: Buena Vista, 1 female (IRSN). *Beni*: 1 male, 1 female (CBF). *PARAGUAY. Departamento Central*: Assunción, 1 female (IBSP 8441). *URUGUAY. Canelones*: Marinidia, 1 male (IBSP 4038). *Lavalleja*: Solis de Mataojo, 1 female (IBSP 4042); Cerro Arequita, 1 female (IBSP 4049); Aguas Blancas, 1 female (IBSP 4039). *Colonia*: Colonia (Astilleros), 1 female (IBSP 4046).

**Diagnose:** As in generic description.

**Description:** *Male* (IBSP 23889). Carapace, sternum, endites, labium, legs and dorsal abdomen brown; black ventral abdomen, with two white points close to the spinnerets and two white points next to the epigastric furrow. Total length 12.60. Carapace 7.10 long and 5.30 wide. Clypeus 0.30 high. Eye diameters: OMA 0.28. OLA 0.24. OLP 0.32. OMP 0.38. Leg measurements: I: femur 6.10/ patella 2.80/ tibia 5.90/

metatarsi 5.20/ tarsi 2.50/ total 22.50; II: 5.20/ 2.50/ 4.70/ 4.50/ 1.80/18.70; III: 4.60/ 2.10/ 3.90/ 4.60/ 1.60/ 22.80; IV: 6.30/ 2.50/ 5.30/ 6.90/ 2.20/ 23.20. Leg spination: tibia I e II v2-2-2-2, p1-1-0, r1-1-0, III e IV v2-2-2, p1-1, r1-1; metatarsi I e II v2-2-2, p1-1-0, r1-1-0, III v2-2-2, p1-1-1, r1-1-1, IV v1-1-1-1-1-1, p1-1-1, r1-1-1-1. Palp: as in generic description.

**Female** (IBSP 23889). Coloration as in male. Total length 14.30. Carapace 6.80 long and 5.10 wide. Clypeus 0.32 high. Eye diameters: OMA 0.24, OLA 0.21, OLP 0.28, OMP 0.34. Legs measurement: I: femur 5.30/ patella 2.70/ tibia 4.80/ metatarsi 3.90/ tarsi 1.70/ total 18.40; II: 4.50/ 2.60/ 3.80/ 3.70/ 1.60/ 16.20; III: 4.10/ 2.00/ 3.10/ 3.60/ 1.60/ 14.40; IV: 5.50/ 2.40/ 4.70/ 6.00/ 1.90/ 20.50. Leg spination: tibia I and II v2-2-2-2-2, p0, r0, III and IV v2-2-2, p1-1, r1-1, metatarsi I and II v2-2-2, p0, r0, III v2-2-2, p1-1-1, r1-1-1, IV v1-1-1-1-1-2, p1-1-1, r1-1-1-1. Epigynum: as in generic description.

**Variation:** Ten males: total length 10.20–14.10, carapace 5.40–7.50, femur I 4.70–6.80; ten females: total length 11.40–22.35, carapace 6.20–9.50, femur I 5.30–7.50.

**Distribution:** Colombia, States of Maranhão, Sergipe, Mato Grosso, Goiás, Distrito Federal, Bahia, Mato Grosso do Sul, Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo and Paraná, north, north-east, south-east and southern Brazil, Bolivia, Paraguay, Argentina and Uruguay.

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## REFERENCES

- Bertkau P. 1880.** Verzeichniss der von Prof. Ed. van Beneden auf seiner im Auftrage der Belgischen Regierung unternommen wissenschaftlichen Reise nach Brasilien und La Plata im Jahren 1872–73 gesammelten Arachniden. *Mémoires Couronnes de la Academie Royale des Sciences, Lettres et Beaux-Arts de Belgique* **43**: 1–120.
- Blackwall J. 1865.** Descriptions of recently discovered species and characters of a new genus, of Araneida from The East of Central Africa. *The Annals and Magazine of Natural History* **16**: 336–352.
- Bonnet P. 1956.** Bibliographia araneorum. *Toulouse* **2**: 919–1926.
- Bonnet P. 1957.** Bibliographia araneorum. *Toulouse* **2**: 1927–3026.
- Bremer K. 1994.** Branch support and tree stability. *Cladistics* **10**: 295–304.
- Brescovit AD. 1996.** Revisão do gênero *Centroctenus* Mello-Leitão (Araneae, Ctenidae, Cteninae). *Revista Brasileira de Entomologia* **40**: 301–313.
- Brescovit AD, Simó M. 2007.** On the Brazilian Atlantic Forest species of the spider genus *Ctenus* Walckenaer, with the description of a neotype for *C. dubius* Walckenaer (Araneae, Ctenidae, Cteninae). *Bulletin of British Aracnological Society* **14**: 1–17.
- Bücherl W. 1980.** *Acúleos que matam*. Rio de Janeiro: Livraria Kosmos Editora.
- di Caporiacco L. 1954.** Araignées de la Guyane Française du Muséum d'Histoire Naturelle de Paris. *Commentationes Pontificia Academia Scientiarum* **16**: 45–193.
- Coddington J, Scharff N. 1994.** Problems with zero-length branches. *Cladistics* **10**: 415–423.
- von Eickstedt VR. 1977.** Estudo sobre a sistemática de *Ctenus taeniatus* (Araneae, Labidognatha). *Memórias do Instituto Butantan*, **40/41**: 211–219.
- Farris JS. 1983.** The logical basis of phylogenetic analysis. In: Platnick NI, Funk VA, eds. *Advances in cladistics* **2**: 7–36. Columbia University Press.
- Fitch WM. 1971.** Toward defining the course of evolution: minimal change for a specific tree topology. *Systematic Zoology* **20**: 406–416.
- Griswold CE. 1993.** Investigations into the phylogeny of the Lycosoid spiders and their kin (Arachnida: Araneae: Lycosoidea). *Smithsonian Contributions to Zoology* **539**: 1–39.
- Hyatt KH. 1954.** The African spiders of the family Ctenidae in the collections of the British Museum (Natural History). *The Annals and Magazine of Natural History* **84**: 877–894.
- Höfer H, Brescovit AD. 2000.** A revision of the neotropical spider genus *Ancylometes* Bertkau (Araneae: Pisauridae). *Insect Systematic and Evolution* **31**: 323–360.
- Höfer H, Brescovit AD, Gasnier T. 1994.** The wandering spiders of the genus *Ctenus* (Ctenidae, Araneae) of Reserva Ducke, a rainforest reserve in central Amazonia. *Andrias* **13**: 81–98.
- Jocqué R, Steyn T. 1997.** *Petaloctenus*, a new genus of Ctenidae from West-Africa (Arachnida, Araneae). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique* **67**: 107–117.
- Keyserling E. 1891.** Die Spinnen Amerikas. Brazilianische Spinnen. *Nürnberg* **3**: 1–278.
- Koch CL. 1847.** *Die Arachniden*. Nürnberg: Vierzehnter Band, 89–210, Funfzehnter Band, 1–136, Sechszehnter Band, 1–80.
- Lehtinen PT. 1967.** Classification of the Cribellate spiders and some allied families, with notes on the evolution of the suborder Araneomorpha. *Annales Zologici Fennici* **4**: 199–468.
- Levi HW. 1991.** The Neotropical and Mexican species of the orb-weaver genera *Araneus*, *Dubiepeira*, and *Aculepeira* (Araneae: Araneidae). *Bulletin of the Museum of Comparative Zoology* **152**: 167–315.
- de Mello-Leitão CF. 1933.** Catalogo das aranhas argentinas. *Arquivos da Escola Superior de Agricultura e Medicina Veterinária* **10**: 3–63.
- de Mello-Leitão CF. 1936.** Contribution à l'étude des Ctenides du Bresil. *Festschrift für Strand* **1**: 1–31.
- de Mello-Leitão CF. 1939.** Algumas aranhas de S.-Paulo e Santa Catarina. *Memórias do Instituto Butantan* **12**: 523–531.
- de Mello-Leitão CF. 1941.** Las arañas de Córdoba, La Rioja, Catamarca, Tucumán, Salta y Jujuy colectadas por los Profesores Birabén. *Revista del Museo de La Plata* **2**: 99–198.
- de Mello-Leitão CF. 1947.** Aranhas do Paraná e Santa Catarina, das coleções do Museu Paranaense. *Arquivos do Museu Paranaense* **6**: 231–304.
- Page RDM. 2001.** NDE: Nexus Data Editor, version 0.5.0. Available at <http://taxonomy.zoology.gla.ac.uk/rod/NDE/nde.html>
- Pickard-Cambridge FO. 1897.** On Cteniform spiders from the lower Amazons and others regions of North and South America, with list of all known species of these groups hitherto recorded from the New World. *The Annals and Magazine of Natural History* **19**: 52–106.
- Pickard-Cambridge FO. 1902.** New species of spiders belonging to the genus *Ctenus*, with supplementary notes. *The Annals and Magazine of Natural History* **9**: 401–415.

- Pinto-da-Rocha R, Caron SF. 1989.** Catálogo do material-tipo da coleção de Arachnida Rudolf Bruno Lange do Museu de História Natural 'Capão da Imbuia', Curitiba, Paraná, Brasil. *Revista Brasileira de Biologia* **49**: 1021–1029.
- Platnick NI. 2008.** *The world spider catalog, version 8.5*. New York: American Museum of Natural History. Available at <http://research.amnh.org/entomology/spiders/catalog/index.html> (accessed 10 January 2008).
- Polotow D, Brescovit AD, Ott R. 2007.** Description and ecological notes on *Isoctenus malabaricus* sp. nov. (Araneae, Ctenidae) from Southern Brazil. *Iheringia, Série Zoológica* **97**: 215–218.
- Polotow D, Brescovit AD, Pellegatti-Franco F. 2005.** Redescription of *Isoctenus coxalis* (F.O.P. Cambridge, 1902) comb. nov. and description of *I. corymbus*, a new species of cave dwelling spider (Araneae, Ctenidae, Cteninae) from the state of Goiás, Brazil. *Revista Ibérica de Aracnologia* **11**: 37–42.
- Roewer CF. 1951.** Neue Namen einiger Araneen-Arten. *Abhandlungen vom naturwissenschaftlichen Verein zu Bremen* **32**: 437–456.
- Schmiedeknecht E. 1953.** Bericht über einige Spinnentiere aus Venezuela. *Verhandlungen der naturforschenden Gesellschaft in Basel* **64**: 1–57.
- Schmidt GE. 1956.** Genus und Speziesdiagnosen neuer, mit Bananen eingeschleppter Spinnen nebst Mitteilung über das Auffinden der Männchen zweier Spinnenarten. *Zoologischer Anzeiger* **157**: 24–31.
- Silva D. 2003.** Higher-level relationships of the spider family Ctenidae (Araneae: Ctenoidea). *Bulletin of the American Museum of Natural History* **274**: 1–86.
- Simó M, Brescovit AD. 2001.** Revision and cladistic analysis of the Neotropical spider genus *Phoneutria* Perty, 1833 (Araneae, Ctenidae), with notes on related Cteninae. *Bulletin of the British Arachnological Society* **12**: 67–82.
- Steyn TL, van der Donckt J, Jocqué R. 2002.** The Ctenidae (Araneae) of the rainforests in eastern Côte d'Ivoire. *Annales du Musée Royal de l'Afrique Centrale* **290**: 129–166.
- Strand E. 1909a.** Neue oder wenig bekannte südamerikanische *Cupiennius* und *Ctenus* Arten. *Zoologische Jahrbücher, II Abteilung für Systematik* **28**: 293–328.
- Strand E. 1909b.** Neue oder wenig bekannte neotropische cteniforme Spinnen des Berliner Museums. *Zoologische Jahrbücher, II Abteilung für Systematik* **28**: 401–428.
- Swofford DL. 2001.** *PAUP\*, Phylogenetic Analysis Using Parsimony (\*and Other Methods), version 4.0b10*. Sunderland, MA: Sinauer Associates.
- Swofford DL, Maddison WP. 1987.** Reconstructing ancestral character states under Wagner parsimony. *Mathematical Biosciences* **87**: 199–229.
- Tullgren A. 1905.** Araneida from the Swedish expedition through the Gran Chaco and the Cordilleras. *Arkiv för Zoologi* **19**: 1–81.
- Walckenaer CA. 1837.** Histoire naturelle des Insectes Aptères. *Paris* **1**: 1–682.

## SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

**Appendix S1.** Exemplar taxa and their voucher specimens (with collection and deposition data) scored for the cladistic analysis.

**Appendix S2.** Character state matrix.

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## APPENDIX 1

List of informative and autapomorphic characters. Except as noted, states are (0) absent and (1) present.

*Male palp:*

- Median tibial process, in addition to RTA: it is an elongated process arising from median retrolateral area of tibia. It is a synapomorphy of *Ctenus ornatus* (Brescovit & Simó, 2007, figs 16 and 17) and *C. vehemens* (Brescovit & Simó, 2007, figs 21 and 22).
- Retrolateral distal tibial process (rdp): tibia presents a distal process, truncate or elongated and convex (in ventral view). It is present in *Isoctenus foliifer* (Figs 4A-B), *I. janeirus* (Figs 5A-B), *I. areia* (Figs 6A-B) and *I. coxalis* (Polotow *et al.*, 2005, fig. 1 and 2) and independently in *Parabatinga brevipes* (Fig. 17A).
- Ventral tibial apophysis (va): (0) present; (1) absent. In most of the examined taxa the tibia presents a short and curved ventral distal apophysis. It is absent in *Enoploctenus cyclothorax* (Fig. 18B).
- Retrolateral tibial apophysis (RTA): (0) one branch; (1) two branches, dorsal branch elongated; (2) two branches, dorsal branch short and slender; (3) two branches, dorsal branch truncated. In several species used in this analysis the RTA is formed by only one branch (state 0). State 1 is characterized by a two branched RTA, with the dorsal branch elongated, reaching the cymbium in length in ventral view and is present in *Parabatinga brevipes* (Fig. 17A), *Isoctenus coxalis* (Polotow *et al.*, 2005, fig. 2), *I. corymbus* (Polotow *et al.*, 2005, fig. 7), *I. griseolus* (Fig. 7A), *I. taperae* (Fig. 8A), *I. ordinario* (Fig. 9A), *I. strandi* (Fig. 15A), *I. malabarisis* (Polotow *et al.*, 2007, fig. 2) and *I. eupalaestrus* (Fig. 10A). State 2 is characterized by a two-branched RTA, with the dorsal branch short and slender, not reaching the cymbium in retrolateral view, and is present in a clade formed by *I. minusculus* (Fig. 14A) and *Isoctenus herteli* (Fig. 13A) and independently in a clade formed by *I. charada* (Fig. 12A) and *I. segredo* (Fig. 11A). State 3 is characterized by a two branches RTA, with the dorsal branch truncate and short with internal grooves, and is present in a clade formed by *Isoctenus foliifer* (Fig. 4A), *I. janeirus* (Fig. 5A) and *I. areia* (Fig. 6A) and independently in *Africactenus evadens* (Steyn *et al.*, 2002, figs 11-15).
- Dorsal branch of RTA with hyaline tip: it is autapomorphic to *Parabatinga brevipes* (Figs 17A-B).
- Basal depression of tibia: it is a depression located in the tibia below the RTA and is autapomorphic to *Enoploctenus cyclothorax* (Fig. 18B, pointed by the arrow).
- Ventrobasal depression of cymbium: (0) present; (1) absent. Most of the examined taxa present a depression in the ventrobasal area of cymbium to accommodate the ventral tibial apophysis (character 3). The absence of this feature is autapomorphic to *Enoploctenus cyclothorax* (Fig. 18B).
- Ventrobasal fold of cymbium (vfc): *Centroctenus ocelliventer* (Brescovit, 1996, figs 18), *Africactenus evadens* (Steyn *et al.*, 2002, figs 11-15), *Petaloctenus bossema* (Jocqué & Steyn, 1997, fig. 7), *Parabatinga brevipes* (Fig. 17A) and the *Isoctenus* species (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1) present a fold in ventrobasal area of cymbium. This feature delimits retrolaterally the ventrobasal depression of the cymbium and accommodates the ventral tibial apophysis.
- Ventral retrolateral projection of cymbium (vrp): it is a synapomorphy of *Isoctenus* (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1) and it is reversed in *Isoctenus minusculus* (Fig. 14A).
- Dorsal retrolateral projection of cymbium (drp): it is a synapomorphy of *Isoctenus* (Figs 4A, 5A, 6A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1) and it is reversed in *Isoctenus griseolus* (Fig. 7A).
- Retrolateral depression of cymbium (rdc): a retrolateral depression in cymbium base, close to the ventrobasal fold of cymbium, is a synapomorphy of a clade formed by *Africactenus evadens* (Steyn *et al.*, 2002, figs 11-15), *Petaloctenus bossema* (Jocqué & Steyn, 1997, fig. 7 and 8), *Parabatinga brevipes* (Fig. 17A) and *Isoctenus* (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1).
- Pair of apical spines in the cymbium: it is synapomorphic to *Isoctenus strandi* (Figs 15A-B) and *I. malabarisis* (Polotow *et al.*, 2007, fig. 1-2).
- Shape of median apophysis: (0) hook; (1) cup-shaped, single margin; (2) cup-shaped, bimarginate; (3) cup-shaped, prolaterally curved; (4) cup-shaped, ?-shape; (5) cup-shaped, elongated. *Ancylometes concolor* (Höfer & Brescovit, 2000, fig. 5) presents a median apophysis flattened and with a hooked tip (state 0). The cup-shaped median apophysis is characterized by Griswold (1993) by a prolateral surface concave and a retrolateral surface convex and occurs in most of the examined taxa. State 1 is characterized by a

- cup-shaped median apophysis which presents a single dorsal margin, as occurs in *Enoploctenus cyclothorax* (Fig. 18B) and independently in a clade formed by *Africactenus evadens* (Steyn *et al.*, 2002, figs 11-15) and *Petaloctenus bossema* (Jocqué & Steyn, 1997, figs 7 and 8). State 2 is characterized by the median apophysis bimarginate with an apical groove and it occurs in *Phoneutria nigriventer* (Simó & Brescovit, 2001, fig. 7), *Ctenus dubius* (Brescovit & Simó, 2007, figs 1 and 2), *C. sigma*, *C. ornatus* (Brescovit & Simó, 2007, fig. 16), *C. medius* (Brescovit & Simó, 2007, fig. 9), *C. vehemens* (Brescovit & Simó, 2007, fig. 21) and *C. villasboasi* (Höfer *et al.*, 1994, figs 3a-b). Cup-shaped median apophysis with a reduced prolateral margin, curved prolaterally in ventral view (state 3), occurs only in *Parabatinga brevipes* (Fig. 17A). Cup-shaped median apophysis with a reduced prolateral margin and elongated retrolateral margin, curved prolaterally with ?-shape (state 4) in ventral view is a synapomorphy of *Isoctenus* species (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1). A cup-shaped and elongated median apophysis (state 5) is autapomorphic to *Centroctenus ocelliventer* (Brescovit, 1996, figs 18-19).
14. Anterior projection of median apophysis (ap): it is a synapomorphy of *Isoctenus* (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1).
  15. Posterior projection of median apophysis (pp): it is a synapomorphy of *Isoctenus* (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1).
  16. Laminar projection of median apophysis (lp): it is an autapomorphy to *Parabatinga brevipes* (Fig. 17A).
  17. Embolus base: (0) fixed to the tegulum by sclerotized attachment; (1) flexibly, attached to tegulum through membranous cuticle. Most of the examined taxa present a flexible embolus base. State 0 occurs only in *Ancylometes concolor* (Höfer & Brescovit, 2000, fig. 5) and *Enoploctenus cyclothorax* (Fig. 18B).
  18. Embolus insertion: (0) median; (1) proximal. Most of the examined taxa present the insertion of the embolus in median area of tegulum. The insertion of embolus in proximal area of tegulum is a synapomorphy of a clade formed by *Phoneutria nigriventer* (Simó & Brescovit, 2001, fig. 7), *Ctenus dubius* (Brescovit & Simó, 2007, figs 1-2), *C. sigma*, *C. ornatus* (Brescovit & Simó, 2007, fig. 16), *C. medius* (Brescovit & Simó, 2007, fig. 9) and *C. vehemens* (Brescovit & Simó, 2007, fig. 21).
  19. Shape of embolus: (0) spiniform; (1) curve with large base; (2) laminar. The spiniform embolus is elongated and slender and it occurs only in *Ancylometes concolor* (Höfer & Brescovit, 2000, fig. 5). The curved embolus with large base occurs in *Centroctenus ocelliventer* (Brescovit, 1996, fig. 19), *Petaloctenus bossema* (Jocqué & Steyn, 1997, fig. 7), *Africactenus evadens* (Steyn *et al.*, 2002, fig. 13) and *Isoctenus* (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1). The laminar embolus is characterized by short tip and large base, covering the subtegulum and it is a synapomorphy of a clade formed by *Phoneutria nigriventer* (Simó & Brescovit, 2001, fig. 7), *Ctenus dubius* (Brescovit & Simó, 2007, figs 1-2), *C. villasboasi*, *C. sigma*, *C. ornatus* (Brescovit & Simó, 2007, fig. 16), *C. medius* (Brescovit & Simó, 2007, fig. 9) and *C. vehemens* (Brescovit & Simó, 2007, fig. 21).
  20. Bifid tip of embolus: it is a synapomorphy to *Isoctenus foliifer* (Fig. 19E), *I. janeirus* (Fig. 19G), *I. areia*, *I. coxalis* (Fig. 19F), *I. corymbus*, *I. griseolus*, *I. ordinario* (Fig. 19H) and *I. taperae*.
  21. Hooked tip of embolus: it is a synapomorphy to *Isoctenus malabaricus* (Fig. 19D), *I. strandi* (Fig. 19C), *I. herteli* and *I. minusculus* (Fig. 19B).
  22. Hyaline projection of embolus tip: it is an autapomorphy to *Parabatinga brevipes* (Fig. 16C).
  23. Laminar basal retrolateral projection of embolus: it is a synapomorphy of a clade formed by *Ctenus dubius* (Brescovit & Simó, 2007, figs 1-2), *C. sigma*, *C. ornatus* (Brescovit & Simó, 2007, fig. 16), *C. medius* (Brescovit & Simó, 2007, fig. 9) and *C. vehemens* (Brescovit & Simó, 2007, fig. 21).
  24. Elongated basal retrolateral projection of embolus: it is a synapomorphy of a clade formed by *Isoctenus foliifer* (Fig. 19E), *I. areia*, *I. janeirus* (Fig. 19G), *I. coxalis* (Fig. 19F), *I. corymbus* and *I. griseolus*.
  25. Spine-like retrolateral projection of embolus: it is a synapomorphy of a clade formed by *Ctenus ornatus* (Brescovit & Simó, 2007, fig. 16), *C. medius* (Brescovit & Simó, 2007, fig. 9) and *C. vehemens* (Brescovit & Simó, 2007, fig. 21).
  26. Ventral process of embolus: it occurs in a clade formed by *I. areia*, *I. janeirus* (Fig. 19G), *I. coxalis* (Fig. 19F), *I. corymbus* and *I. griseolus* and it is reversed in *Isoctenus foliifer* (Fig. 19E). It arises independently in *Phoneutria nigriventer*.
  27. Basal projection of embolus: (0) hook; (1) laminar. The basal projection of embolus interlocks with a corresponding lobe on the subtegulum (subtegulum/tegulum locking lobes, Griswold

- 1993: character 6) and presents a projection with a plesiomorphic hook-shape (state 0) or an elongated projection with a dorsal laminar process (state 1) (Fig. 18A).
28. Basal projection with a dorsal laminar process: (0) positioned behind the embolus, partially visible in ventral view; (1) completely visible in ventral view. The basal projection of embolus with a dorsal laminar process is partially visible in ventral view only in *Africactenus evadens* (Steyn *et al.*, 2002, figs 11-15) and *Petaloctenus bossema* (Jocqué & Steyn, 1997, figs 7-8) and it is completely visible in ventral view in a clade formed by *Parabatinga brevipes* (Fig. 17A) and the *Isoctenus* species (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1).
  29. Conductor (c): (0) ventral groove to accommodate the embolus; (1) laminar, positioned longitudinally; (2) laminar and wide; (3) elongated; (4) C-shape. A conductor with a ventral groove characterizes state 0 and it occurs in *Ancylometes concolor* (Höfer & Brescovit, 2000, fig. 5). A laminar conductor positioned longitudinally characterizes state 1 and it is an autapomorphy to *Enoploctenus cyclothorax* (Fig. 18B). State 2 is characterized by a laminar, short and large conductor and it is a synapomorphy of a clade formed by *Isoctenus* (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1), *Parabatinga brevipes* (Fig. 17A), *Africactenus evadens* (Steyn *et al.*, 2002, fig. 13) and *Petaloctenus bossema* (Jocqué & Steyn, 1997, figs 7-8). The elongated and thin conductor (state 3) is an autapomorphy to *Centroctenus ocelliventer* (Brescovit, 1996, fig. 19). The C-shape conductor is a synapomorphy of a clade formed by *Phoneutria nigriventer* (Simó & Brescovit, 2001, fig. 7), *Ctenus dubius* (Brescovit & Simó, 2007, figs 2-3), *C. sigma*, *C. ornatus* (Brescovit & Simó, 2007, figs 16-17), *C. medius* (Brescovit & Simó, 2007, figs 9-10), *C. vehemens* (Brescovit & Simó, 2007, figs 21-22) and *C. villasboasi* (Höfer *et al.*, 1994, figs 3a-b).
  30. Sclerotized tegular projection in the conductor base (stc): it is a synapomorphy of a clade formed by *Isoctenus foliifer* (Fig. 19E), *I. areia*, *I. janeirus* (Fig. 19G), *I. coxalis* (Fig. 19F), *I. corymbus*, *I. griseolus* and *I. ordinario* (Fig. 19H).
  31. Membranous tegular projection (mtp): it is autapomorphic to *Enoploctenus cyclothorax* (Fig. 18B).
  32. Proximal tegular process (ptp): it is a synapomorphy of a clade formed by *Ctenus dubius* (Brescovit & Simó, 2007, figs 1-3), *C. sigma*, *C. ornatus* (Brescovit & Simó, 2007, fig. 16), *C. medius* (Brescovit & Simó, 2007, fig. 9) and *C. vehemens* (Brescovit & Simó, 2007, fig. 21).
  33. Prolateral tegular depression to accommodate the embolus (ptd): it is a synapomorphy of a clade formed by *Isoctenus* (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1), *Parabatinga brevipes* (Fig. 17A), *Petaloctenus bossema* (Jocqué & Steyn, 1997, figs 7-8) and *Africactenus evadens* (Steyn *et al.*, 2002, figs 11-15).
  34. Central tegular depression to accommodate the median apophysis: it is a synapomorphy of *Isoctenus* (Fig. 19B-D).
  35. Voluminous subtegulum: with approximately half of the tegulum size is a synapomorphy of a clade formed by *Isoctenus* (Figs 4A, 5A, 6A, 7A, 8A, 9A, 10A, 11A, 12A, 13A, 14A, 15A; Polotow *et al.*, 2005, figs 1 and 6; Polotow *et al.*, 2007, fig. 1) and *Parabatinga brevipes* (Fig. 17A).
  36. Subtegulum projection (stp): (0) absent; (1) basal; (2) median. The projection of the subtegulum interlocks with the basal projection of embolus and is positioned medially in *Centroctenus ocelliventer*, *Africactenus evadens* (Steyn *et al.*, 2002, figs 11-15), *Petaloctenus bossema* (Jocqué & Steyn, 1997, figs 7-8), *Parabatinga brevipes* and *Isoctenus* (Fig. 18A). The projection positioned basally in the subtegulum occurs in a clade formed by *Ctenus villasboasi*, *C. dubius*, *C. ornatus*, *C. medius*, *C. vehemens*, *C. sigma* and *Phoneutria nigriventer*.
- ### Epigynum
37. Copulatory pockets (CP): (0) absent; (1) atrium; (2) lobe. State 1 refers to the median field with copulatory pockets with a large entrance. State 2 refers to the median field with copulatory pockets with rounded and projected shape, and it is synapomorphic of a clade formed by *Phoneutria nigriventer*, *Ctenus dubius* (Brescovit & Simó, 2007, fig. 5), *C. sigma*, *C. ornatus* (Brescovit & Simó, 2007, fig. 18), *C. medius* (Brescovit & Simó, 2007, fig. 11), *C. vehemens* (Brescovit & Simó, 2007, fig. 25) and *C. villasboasi*.
  38. Lateral spurs (ls): (0) absent; (1) present, as a projection; (2) present, extending as an internal wall. Lateral spurs occur in all examined taxa, except *Ancylometes concolor* (Höfer & Brescovit, 2000, fig. 6). Lateral spurs as simple projections, not extended as internal walls, occur only in *Enoploctenus cyclothorax*. Lateral spurs extended as internal walls occur in most examined taxa of this analysis (Fig. 4D; Polotow *et al.*, 2005, fig. 4).
  39. Internal wall (iw): (0) partially visible in ventral view; (1) totally visible in ventral view; (2) as a lobe, partially visible in ventral view. State 0

refers to the internal wall partially covered by the median field in ventral view and it is the plesiomorphic state. State 1 is characterized by an internal wall totally visible in ventral view, not covered by the median field, and it is a synapomorphy of a clade formed by *Isoctenus eupalaestrus* (Fig. 10C), *I. segredo* (Fig. 11C), *I. charada* (Fig. 12C), *I. herteli* (Fig. 13C), *I. minusculus* (Fig. 14C), *I. strandi* (Fig. 15C) and *I. malabaricus* (Polotow *et al.*, 2007, fig. 3). State 2 refers to the internal wall as a lobe and it is a synapomorphy of a clade formed by *Ctenus dubius* (Brescovit & Simó, 2007, fig. 5), *C. sigma*, *C. ornatus* (Brescovit & Simó, 2007, fig. 18), *C. medius* (Brescovit & Simó, 2007, fig. 11) and *C. vehemens* (Brescovit & Simó, 2007, fig. 25).

40. Spermathecae (s): (0) rounded; (1) base and head differentiated; (2) *Ctenus villasboasi*-like. State 0 is characterized by a rounded spermathecae and it is the plesiomorphic state. State 1 arises in a clade formed by *Africactenus evadens* (Steyn *et al.*, 2002, fig. 15), *Petaloctenus bossema* (Jocqué & Steyn, 1997, figs 10-11), *Parabatinga brevipes* and *Isoctenus* species (Figs 4D, 5D, 6D, 7D, 7D, 8D, 9D, 10D, 11D, 12D, 13D, 14D, 15D; Polotow *et al.*, 2005, fig. 4; Polotow *et al.*, 2007, fig. 4) and it is reversed to a rounded form in *Parabatinga brevipes* (Fig. 17D). State 2 occurs only in *Ctenus villasboasi* (Höfer *et al.*, 1994, fig. 4a) and it is characterized by a rounded spermathecae with a long and tubular dorsal projection.
41. Ventral wall (vw): (0) smooth; (1) one fold behind the spermathecae in dorsal view; (2) one fold covering part of spermathecae in dorsal view. A smooth ventral wall characterizes state 0 and occurs in most examined taxa. A ventral wall with one fold behind the spermathecae characterizes state 1 and it is a synapomorphy of a clade formed by *Isoctenus foliifer* (Fig. 4D), *I. janeirus* (Fig. 5D), *I. areia* (Fig. 6D), *I. griseolus* (Fig. 7D), *I. taperae* and *I. ordinario* (Fig. 9D). A ventral wall with one fold covering part of spermathecae characterizes state 2 and it is a synapomorphy of a clade formed by *Isoctenus eupalaestrus* (Fig. 10D), *I. charada* (Fig. 12D) and *I. segredo* (Fig. 11D).

#### Somatic features

42. Number of retromarginal teeth: (0) four; (1) three. Four teeth is a plesiomorphic condition and it occurs in most of the examined taxa. Three teeth arise in *Centroctenus ocelliventer* (Brescovit, 1996, fig. 1) and independently in *Parabatinga brevipes*.
43. Intermarginal denticles: they occur between the promarginal and retromarginal teeth rows of the

chelicerae and it is a potential synapomorphy of Cteninae (Fig. 3A).

44. Length of labium: (0) half of the endites size; (1) short, one third of the endites size. The short labium is a synapomorphy of a clade formed by *Parabatinga* plus *Isoctenus*.
45. Cephalothorax: (0) highest at the fovea, sloping abruptly posteriorly (Hyatt, 1954, fig. 1); (1) divided in two regions by a deep U-shaped depression (Hyatt, 1954, fig. 2). State 1 is the character used to identify the subfamily Acantheinae, represented in this analysis by *Petaloctenus bossema* and *Africactenus evadens*. In this analysis it arises in a clade formed by *Petaloctenus bossema* and *Africactenus evadens* and independently in *Enoploctenus cyclothorax*.
46. Scopulae in the pedipalp: it is autapomorphic to *Phoneutria nigriventer* (Simó & Brescovit, 2001).
47. Tarsal claw of the female pedipalp: (0) three elongated teeth; (1) three robust teeth, *Ctenus*-like; (2) five short teeth, *Phoneutria*-like; (3) five to seven elongated teeth, *Isoctenus*-like. Three elongated teeth, in some taxa with additional small proximal teeth, is a plesiomorphic condition and occurs in most of the examined taxa of this analysis (Figs 20A-C). A claw with three robust teeth (Fig. 20E) occurs in a clade formed by *Ctenus dubius*, *C. ornatus*, *C. medius*, *C. vehemens* and *C. villasboasi*. A claw with five short teeth (Fig. 20F) is autapomorphic to *Phoneutria nigriventer*. A claw with five to seven elongated teeth (Fig. 20D) is a synapomorphy of *Isoctenus*.
48. Number of ventral spines in tibiae I and II: (0) four pairs; (1) five pairs; (2) seven pairs; (3) six pairs. State 0 occurs only in *Ancylometes concolor*. State 1 occurs in most of the examined taxa and is characterized by five pairs of ventral spines in tibia, with the distal pair positioned in tibia distal border. State 2 is autapomorphic to *Enoploctenus cyclothorax*. State 3 is autapomorphic to *Africactenus evadens*.
49. Ventral spines in tibia I and II: (0) distal pair positioned in the tibial distal border; (1) distal pair distant from tibial distal border. State 1 arises independently in *Enoploctenus cyclothorax* and in a clade formed by *Africactenus evadens* and *Petaloctenus bossema*.
50. Three pairs of ventral spines in metatarsi I and II: (0) distal pair positioned in the metatarsal distal border; (1) distal pair distant from metatarsal distal border. State 1 arises independently in *Enoploctenus cyclothorax* and in a clade formed by *Africactenus evadens* and *Petaloctenus bossema*.
51. Internal insertion of the teeth of the tarsal claws I and II: it occurs only in males of *Africactenus*

*evadens* and *Petaloctenus bossema* and it is a synapomorphy of this clade (Figs 20G-H).

52. Ventral projection on male coxa IV: it is a synapomorphy of *Isoctenus griseolus*, *I. coxalis* (Polotow *et al.*, 2005, fig. 5), *I. corymbus* and *I. areia*, and it is reversed in a clade formed by *I. foliifer* and *I. janeirus*.
53. Male metatarsi IV modified: it is a synapomorphy of a clade formed by *Ctenus ornatus* (Brescovit & Simó, 2007, figs 23-24), *C. vehemens* (Brescovit & Simó, 2007, figs 16-17) and *C. medius* (Brescovit & Simó, 2007, figs 9 and 10).

#### *Behavioral attributes*

54. Egg sac: (0) carried by the chelicerae; (1) fixed in vertical surface. State 1 arises in *Enoploctenus cyclothorax* (pers. obs.) and independently in *Isoctenus corymbus* (Pellegatti-Franco, pers. obs.).
55. *Phoneutria*-like defensive behavior: in this analysis it is an autapomorphy to *Phoneutria nigriventer* (Simó & Brescovit, 2001), but this character presents missing entries for several terminals. Bärcherl (1980) described the defensive behavior of species of *Phoneutria*.