



RESEARCH ARTICLE

**A second new species of *Isotogastrura* Thibaud & Najt
(Collembola: Isotogastruridae) from Brazil**

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Abstract: A new species, *Isotogastrura praiana* **sp. nov.**, is described and illustrated based on the specimens collected from Rio de Janeiro, Southeastern Brazil. The new species is more similar to Mexican *Isotogastrura ahuiholtzi* Palacios-Vargas & Thibaud with respect to presence of two pre labral microchaetae and six sensillae on fourth antennal segments. Diagnostic features of new species are absence of sensilla D and presence of sensilla E on fourth antennal segments, distributing dorsal tubercles from second thoracic segment to third abdominal segment and greyish body color.

Key words: Biodiversity, littoral, Restinga, sand beach, taxonomy.

Introduction

The family Isotogastruridae Thibaud & Najt, 1992 presents a peculiar morphology, composed by characteristics of two different families, Hypogastruridae and Isotomidae, which interestingly belong to different orders, Poduromorpha and Entomobryomorpha. This bizarre set of characters in Isotogastruridae has been discussed by some authors (Thibaud & Najt 1992; Fjellberg 1995, D'Haese 2003), without a defined phylogenetic position.

This family includes the unique genus *Isotogastrura* Thibaud & Najt, 1992 with nine species, typical of marine littoral, of which five of them proceed from Neotropical Region, being one from Brazil: *I. arenicola* Thibaud & Najt, 1992 (Caribbean Islands); *I. coronata* Fjellberg, 1994 (Canary Islands); *I. litoralis* Thibaud & Weiner, 1997 (New Caledonia), *I. ahuiotli* Palacios-Vargas & Thibaud, 1998, *I. veracruzana* Palacios-Vargas & Thibaud, 1998, and *I. atuberculata* Palacios-Vargas & Thibaud, 2001 (Mexico), *I. madagascariensis* Thibaud, 2008 (Madagascar), *I. trichaetosa* Potapov, Bu & Gao, 2011 (China) and *I. mucrospatulata* Palacios-Vargas, Lima & Zeppelini, 2013 (Fernando de Noronha Islands, Brazil).

During our a recent investigations conducted in the southern littoral of Rio de Janeiro, Rio de Janeiro State in 2007, a series of specimens representing an undescribed species from the genus *Isotogastrura* were collected. In this current paper, this new species is described, illustrated and diagnostic characters discussed with related species. The new species herein described is a second species of the genus *Isotogastrura* recorded from Brazil.

Material and methods

The studied specimens were collected from litter and sandy soil trapped among halophyte-psammophyte vegetation of the Restinga da Marambaia, Rio de Janeiro, Rio de Janeiro State, Brazil. The material was extracted with Berlese-Tullgren funnels and mounted in glass slides according to the usual methodology (Arlé & Mendonça 1982). The type-material is deposited in the Collembola Collection at Departamento de Entomologia, Museu Nacional/UFRJ, Rio de Janeiro-RJ, Brazil, under the acronym CM/MNRJ.

Abbreviations: Ant–antennal segments; Th–thoracic segments; Abd–abdominal segments.

Results

Genus *Isotogastrura* Thibaud & Najt, 1992

Type-species: *Isotogastrura arenicola* Thibaud & Weiner, 1992

***Isotogastrura praiana* sp. nov.** (Figs. 1–12)

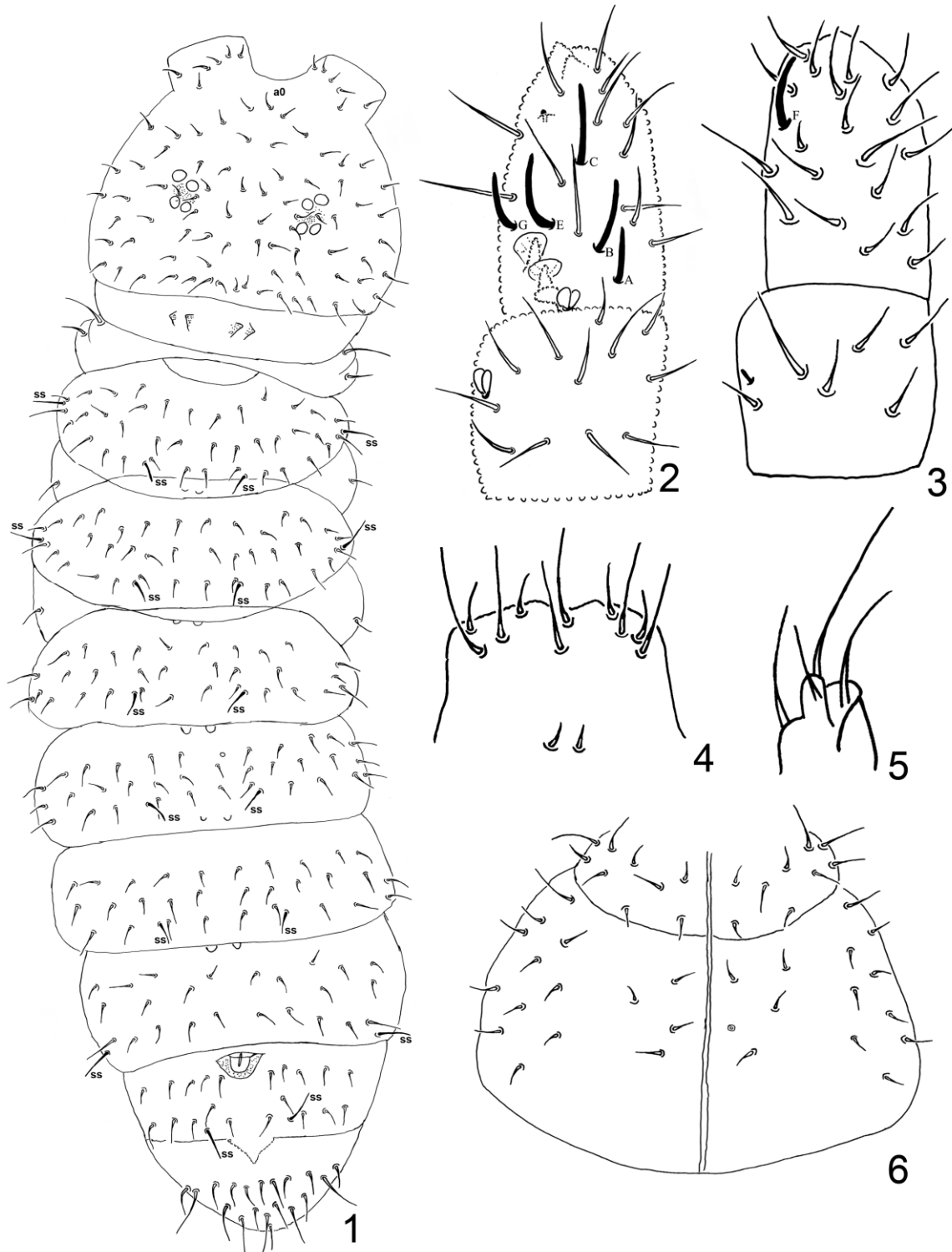
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Description

Body length: 0.42–0.54 mm. Habitus typical of genus. Integument with primary granulation. Body color grayish with darker eye patches. Body chaetotaxy as in Figure 1. Body chaetae smooth; sensorial body chaetae longer and thicker than ordinary chaetae. Sensillar formula by half tergite: 022/11111. Th I with four dorsal tubercles and without chaetae; Th II without dorsolateral microsensilla; Axial chaetae by half tergites of Th II–Abd V as 3,3/3,3,3,2,2. One pair of tubercles on posterior edge of Th II–Abd III; Abd V with one glandular opening partly covered by an oval integumentary fold on median region; Abd VI with odd chaetae a0, m0 e p0, measuring respectively 7µm, 10µm and 7µm; chateae absent on thoracic sternites.

Ant IV with subapical organ, two pointed tegumentar protuberances on apical region and six sensilla, one of them only in ventral view; apical vesicle and microsensilla absent. Ant III with sensory organ formed by two bifid sensillae, being one lateral and another displaced to basal region of Ant IV; one integumentary lobe and two finger-like integumentary papilla situated in front of two fan-like papilla, one microchaetae on ventral

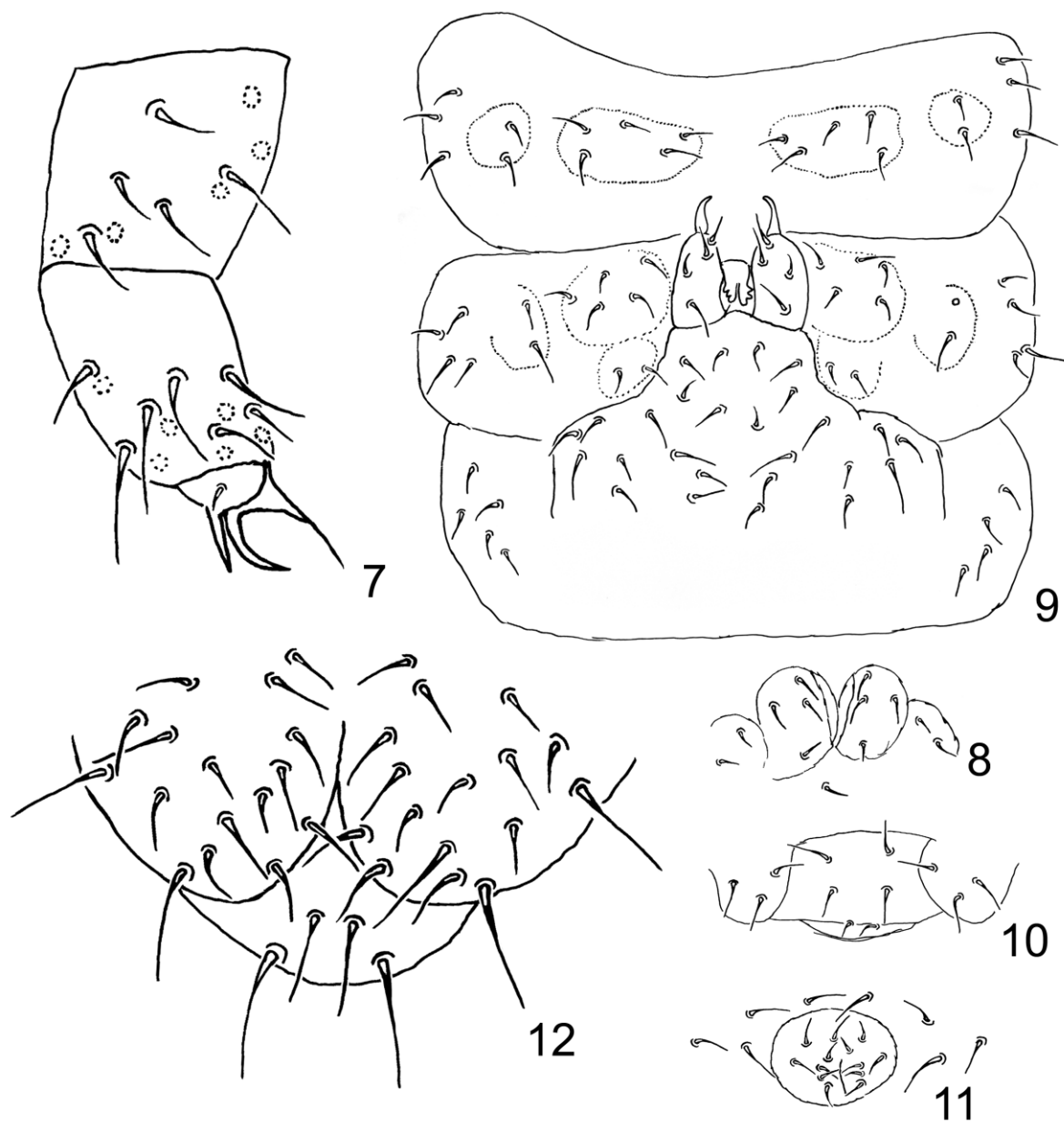
view (Figs. 2, 3), Ant III–IV together measuring 75 μ m; Ant II and I with 11 and 7 chaetae, respectively. Eyes 4+4; postantennal organ absent. Chaetae a0 present; c1 absent. Labrum with 2/3, 3, 4 chaetae (20 μ m); prelabral with microchaetae (Fig. 4). Maxillary outer lobe bifurcate and with two sublobal hairs (18 μ m) (Fig. 5). Labium with two series of 5 and 4 chaetae, respectively. *Linea ventralis* with 3+3 chaetae. Ventral chaetotaxy of head as in Figure 6.



Figures 1–6. *Isotogastrura praiana* sp. nov.. 1, body dorsal chaetotaxy; 2, ant III–IV dorsal view; 3, ant III–IV ventral view; 4, labrum; 5, maxillary outer lobe. 6, ventral chaetotaxy of head.

Tibiotarsi I, II, III with 13, 13, 12 chaetae, respectively. Femora I, II, III with 10, 10, 9 chaetae, respectively. Unguis measuring 8 μ m, without tooth, but with one dorsal spine. Empodial appendage filiform, longer than unguis (Fig. 7).

Ventral tube (20 μ m) with 6+6 chaetae, being 4+4 distal, 2+2 in basal position, and one unpaired posterior seta (Fig. 8). Tenaculum with 3+3 teeth. *Subcoxa furcalis* with 5+5 anterior chaetae and 2+2 posterior chaetae. Furcula developed (60 μ m); manubrium with 13+13 dorsal chaetae, dens with 4 dorsal chaetae; mucro thin and curved at the apex (9 μ m) (Fig. 9). Female genital plate (25 μ m) with 4 pairs of pregenital chaetae, 2 circumgenital chaetae and 2 eugenital chaetae (Fig. 10). Male genital plate (17 μ m) with 4 pairs of pregenital chaetae (6 μ m), 5 circumgenital chaetae (3 μ m) and 4 pairs of short eugenital chaetae (2 μ m) (Fig. 11). Each lateral anal valve with 16 chaetae; without microchaetae (45 μ m) (Fig. 12).



Figures 7–12. *Isotogastrura praiana* sp. nov.. 7, femur and tibiotarsus of leg II; 8, ventral tube; 9, sternites II–IV and furca; 10, female genital plate; 11, male genital plate; 12, anal valves.

Type material: Holotype: ♂ on slide (label 1754 CM/MNRJ). Southeastern Brazil, Rio de Janeiro State, Rio de Janeiro, Restinga da Marambaia (23°02'S-23°06'S; 43°35'W-43°54'W), 30.VII.2007, Abrantes, E.A. and Fernandes, L.H. leg. Paratypes: 2 juveniles on slide (label 1717 CM/MNRJ), 24/V/2007, Abrantes, E.A., Fernandes, L.H. and Mendonça, M.C. leg.; 1 ♀ and 1 ♂ on slide (label 1719 CM/MNRJ), 24/V/2007, Abrantes, E.A., Fernandes, L.H. and Mendonça, M.C. leg.; 1 ♂ on slide (label 1725 CM/MNRJ), 24/V/2007, Abrantes, E.A., Fernandes, L.H. and Mendonça, M.C. leg.; 1 ♂ and 1 juvenile on slide (label 1751 CM/MNRJ), 30/VII/2007, Abrantes, E.A. and Fernandes, L.H. leg.; 2 ♂ and 1 ♀ on slides (label 1752 CM/MNRJ), 30/VII/2007, Abrantes, E.A. and Fernandes, L.H. leg.; 1 ♂ on slide (label 1782 CM/MNRJ), 30/VIII/2007, Abrantes, E.A., Fernandes L.H. and Silveira, T.C. leg.

Etymology: The name “praiana” is relative to beach in Portuguese (“praia”). Means one who inhabits the beach.

Discussion

Isotogastrura praiana **sp. nov.** shares with *I. ahui Zotli*, *I. coronata*, *I. madagascariensis*, and *I. trichaetosa* the presence of two prelabral microsetae. The new species is more similar to *I. ahui Zotli* (from Mexico) by the presence of six sensilla on Ant IV. However, in *I. praiana* **sp. nov.**, sensilla D is absent and the sensilla E is present, which does not occur in *I. ahui Zotli*. Furthermore, *I. praiana* **sp. nov.** has a greyish color and the tubercles are present from Th II to Abd III, whereas *I. ahui Zotli* presents a pink staining and the tubercles are present only from Th II to Abd II. An other important difference is related the chaetotaxy on tergite IV, since *I. ahui Zotli*, the chaetae m5 is absent and the sensillum is situated between chaetae p5 and p6; on *I. praiana* **sp. nov.** the chaetae m4 is absent and the sensillum is situated between chateae p4 and p5.

The new species is also similar to *I. arenicola* and *I. mucrospatulata* by the morphology of glandular opening of Abd V, but in the both species the two prelabral microsetae are absent. Lastly, *I. praiana* **sp. nov.** is distinguished from its congeners by the presence of a tegumentar papilla behind the bifid sensilla in the dorsal region of Ant III–IV.

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