



RESEARCH ARTICLE

**New Brazilian species of *Archisotoma* Linnaniemi, 1912  
(Collembola: Isotomidae)**

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**Abstract:** A new species of *Archisotoma* Linnaniemi, 1912 is described and illustrated based on material from littoral sand of Praia do Sossego beach, Niterói municipality, Rio de Janeiro State, Brazil. The new species *Archisotoma arariboia* **sp.nov.**, the second of the genus described from Brazil, can be distinguished from its congeners by a set of characters: 6+6 eyes, maxillary capitulum unidentate and subequal to internal lamellae, 10 posterior chaetae on manubrium, 4–5 chaetae between the anterior trichobothria and lastly by 1 thick and curved chaetae on trochanter and femur of leg III and 1–2 on femur and 1–2 on tibiotarsus of leg I.

**Key words:** Biodiversity, Collembola, Neotropics, sand beach, taxonomy.

## Introduction

Springtails of Isotomidae family associated to littoral sand have been reported and described from several biogeographical regions (Delamare Deboutteville 1953; Fjellberg 1980; Greenslade & Deharveng 1986; Barra 1997; Thibaud 1992, 2006, 2008a, 2008b, 2009a, 2009b, 2010; Thibaud & Weiner 1994, 1997; Thibaud & Palacios-Vargas 1999; Thibaud & Ndiaye 2006; Thibaud & Boumezzough 2006).

In Brazil, despite the recent increase in number of papers dealing with seashore Isotomidae, the knowledge about this particular fauna is still restrict to the description of only seven species – *Isotomurus riparius* Mendonça, 1990; *Isotomodes carioca* Thibaud & Palacios-Vargas, 1999; *Arlea arenicola* Abrantes & Mendonça, 2005; *Arlea psammophila*

Mendonça *et al.* 2006; *Archisotoma catiae* Abrantes & Mendonça, 2007; *Isotomodes fernandesae* Abrantes & Mendonça, 2007 and *Psammisotoma restingae* Abrantes & Mendonça, 2009.

During the identification of a material received for study, a vast amount of Isotomidae specimens was verified, all of them, belonging to the genus *Archisotoma*. This material was collected from intertidal sand zone of Sossego beach, Niterói municipality, by taxonomic experts in Talitridae Rafinesque 1815 (Peracarida: Amphipoda). The cosmopolitan genus *Archisotoma* comprises nowadays 26 valid species (Bellinger *et al.* 1996-2014), which are intimately associated to coastal intertidal environments, especially sand beaches.

In Brazil, only three species of *Archisotoma* have been recorded so far, all of them from Rio de Janeiro State, Southeastern Brazil – *Archisotoma besselsi* (Packard, 1877), found by Strenzke (1958) in Copacabana beach, Rio de Janeiro municipality; *A. gorbaultae* Thibaud, 1993, found by Thibaud & Palacios-Vargas (2001) in Marambaia and Grumari beaches, Rio de Janeiro municipality; and *A. catiae* Abrantes & Mendonça, 2007, described from sand dunes of Maricá municipality.

The study of material from Sossego beach, Niterói municipality revealed a new species *Archisotoma arariboia* **sp. nov.**, described and illustrated herein. The new species is the second of the genus described from Brazil.

## Material and methods

The studied specimens were sampled during 2011 to 2013 in intertidal sand zone of “Praia do Sossego”, Niterói municipality, Rio de Janeiro State, Southeastern Brazil. The material was extracted through pitfall traps, sorted in stereomicroscope and mounted on glass slides according to usual methodology (Arlé & Mendonça 1982). Illustrations were made with camera lucida and measurements with an ocular micrometer on an optic microscope. Type material has been deposited in the Collembola Collection at Departamento de Entomologia, Museu Nacional/UFRJ, Rio de Janeiro-RJ, Brazil, under the acronym CM/MNRJ.

Abbreviations used in the description are: Ant– antennal segments; Abd– Abdominal segments; Th– thoracic segments.

## Results

### *Archisotoma arariboia* **sp. nov.** (Figs 1–13)

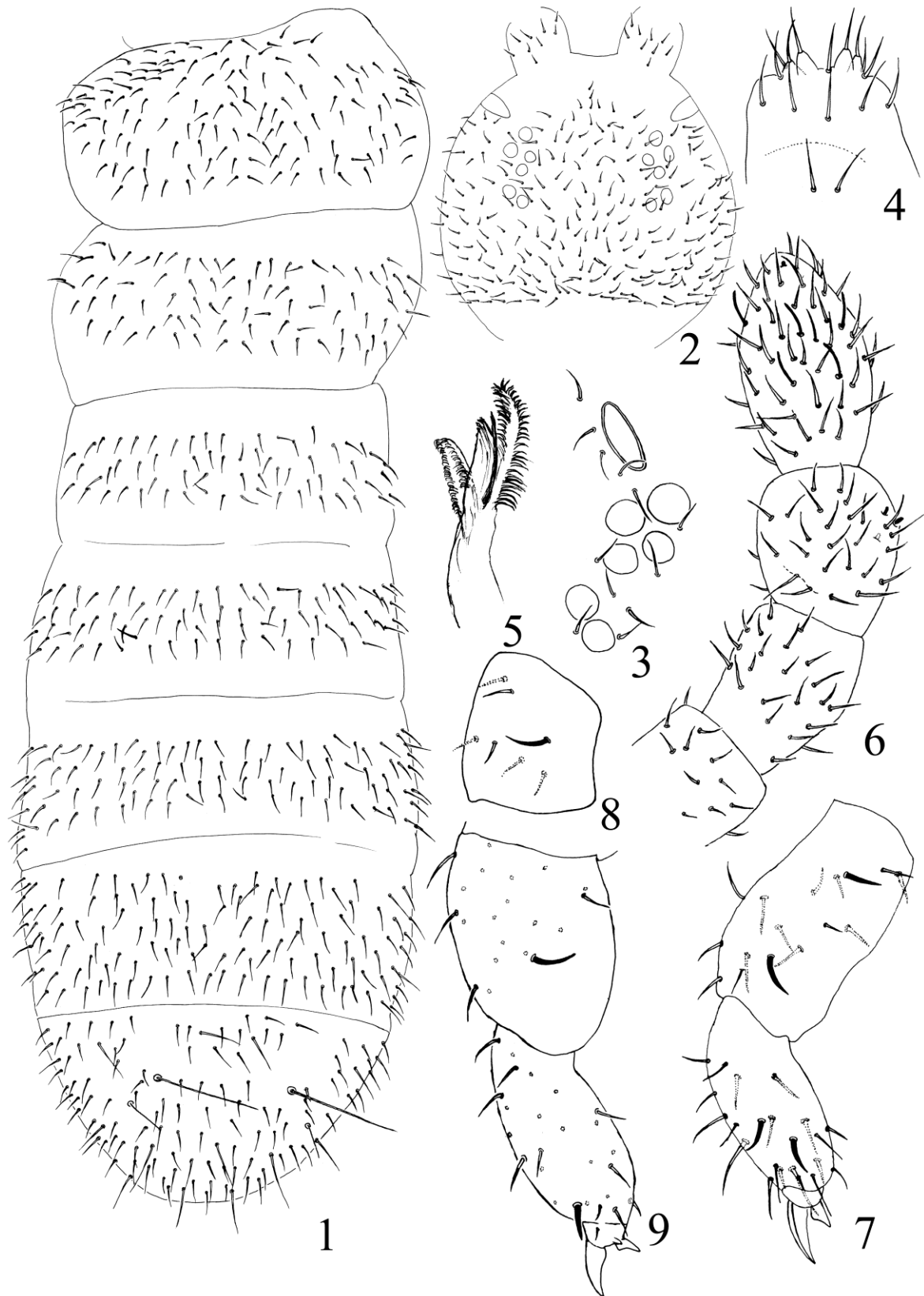
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### Description

Habitus slender and cylindrical, typical of the genus. Mean body length 0.67 mm. Color grayish. Integument smooth.

Body chaetotaxy with short and smooth ordinary chaetae, some of them a little longer on Abd V and VI; Axial chaetae pattern from Th II to Abd IV as 8,5/4,4,4,5; axial chaetae of Abd V–VI without defined pattern. Abd V–VI with 2+2 dorsal thin and smooth trichobothria, an anterior and a posterior pair; anterior pair of trichobothria separated from each other by 4–5 chaetae and twice longer than the posterior pair; the anterior pair is separated from posterior by 3 chaetae (Fig. 1).

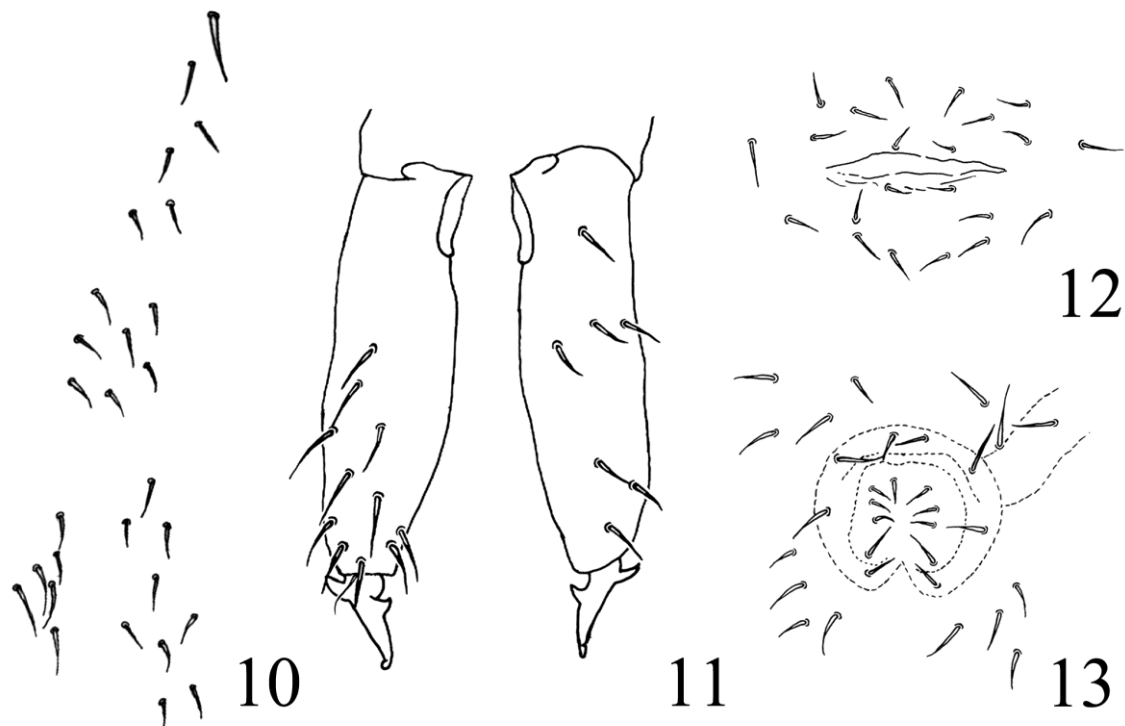
Head chaetotaxy and ocular area as in Figure 2. Eyes 6+6 (10 µm each) disposed in long strongly pigmented eyepatch. Postantennal organ oval (20 µm length), about 2 times as



**Figures 1–9.** *Archisotoma arariboia* sp. nov.. 1, dorsal chaetotaxy of Th II–Abd V–VI; 2, dorsal cephalic chaetotaxy; 3, PAO and eyes; 4, labrum; 5, maxillary head; 6, right antenna; 7, femur and tibia of leg I; 8, trochanter III; 9, femur and tibia of leg III.

long as eye diameter and with 4 surrounding chaetae (Fig. 3). Labrum with two prelabral and 5,5,4 labral undifferentiated chaetae; the last two rows inserted in papillae (Fig. 4). Maxillary head with three lamellae; one unidentate dorsointernal lamellae with minute teeth in its extremity, one ventrointernal lamellae with ciliated edge and one longer strongly fringed ventroexternal lamellae; maxillary capitulum unidentate, long and slender, subequal to internal lamella (Fig. 5). Hypostomal chaeta H long and curved; 4+4 chaetae along *linea ventralis*. Antennae subequal in length to head diagonal; ratio antennae: head = 120  $\mu$ m: 125  $\mu$ m. Ant IV (45  $\mu$ m) with five sensilla poorly differentiated from surrounding ordinary chaetae; subapical organite present. Ant III (30  $\mu$ m) with about 40 chaetae, two small sensory rods, two guard sensilla and a minute lateral sensillum. Ant II (30  $\mu$ m) with about 30 chaetae. Ant I (20  $\mu$ m) with about 20 chaetae and one dorsal microchaeta (Fig. 6). Antennal segments ratio I:II:III:IV = 1: 1,5: 1,5: 2,2.

Appendages. Tibiotarsi I, II and III with 20, 23, 24 chaetae respectively; one thick subapical spur-like chaeta on tibiotarsus III. Leg I with 1–2 curved and thick chaetae on femur and 1–2 on tibiotarsus (Fig. 7); leg II without differentiated chaetae; leg III with one curved and thick chaetae on trochanter and femur (Figs 8, 9). Unguis untoothed (10 $\mu$ m) and short, lanceolate unguiculus, about half the unguis length. Ventral tube with 4+4 laterodistal chaetae. Tenaculum with 4+4 teeth and without chaetae. Anterior subcoxa furcalis with 13 and posterior subcoxa furcalis with 15 chaetae (Fig. 10). Manubrium (60 $\mu$ m) with 10–14 chaetae on posterior side; ventral surface without chaetae. Dens (50 $\mu$ m) with 10–11 chaetae on ventral side and 7 chaetae on dorsal side. Mucro (10 $\mu$ m) with three asymmetrical teeth, the apical tooth bigger than others; basal spine present (Fig. 11). Ratio manubrium: dens: mucro = 6: 5: 1. Female and male genital plates as in Figures 12 and 13, respectively.



**Figures 10–13.** *Archisotoma arariboia* sp. nov.. **10**, subcoxa furcalis chaetotaxy; **11**, anterior (left) and posterior (right) view of dens and mucro; **12**, female genital plate; **13**, male genital plate.

**Type material:** Sand beach “Praia do Sossego”, Niterói municipality, Rio de Janeiro State, Brazil. Local coordinates: 22° 57' S 43° 04' W, 2011–2013. Tardem, A. S. *leg.* Holotype: male on slide 2419a CM/MNRJ, 2011–2013, Tardem, A. S. *leg.*; Paratypes: 7 males and 1 female on slide 2419d CM/MNRJ; 2 males and 1 juvenile on slide 2419e CM/MNRJ; 2 females and 1 juvenile on slide 2419k CM/MNRJ; 2 females on slide 2419m CM/MNRJ, 2011–2013.

**Etymology:** The word “arariboia”, from the Brazilian indigenous Tupi, was the name of the leader of the indigenous clan that helped the Portuguese Army to confront the French Army in “Baía de Guanabara”, Rio de Janeiro State, Brazil, in 1567. Arariboia is considered the founder of the city of Niterói, Rio de Janeiro State.

## Discussion

The species *A. goubaultae* Thibaud, 1993 (Antilles), *A. vaoensis* Thibaud & Weiner, 1997 (New Caledonia), *A. litoralis* Thibaud & Weiner, 1997 (New Caledonia) and *A. catiae* Abrantes & Mendonça, 2007 (Brazil) form a group that share the following characters: body length range of 0.42–0.55 mm, two prelabral chaetae, one subapical spine-like chaeta on tibiotarsus III, unguis without internal tooth, manubrium with 22-23 chaetae, 2+2 trichobothria on Abd V–VI, the anterior trichobothria separated from the posterior by three chaetae. The new species, *Archisotoma arariboia* **sp. nov.**, share the same characters of the referred group, except for the manubrial chaetae and body length, which is longer for the new species.

The new species, *Archisotoma arariboia* **sp. nov.**, differs from *A. vaoensis* by number of eyes (6+6 vs 8+8), posterior chaetae on manubrium (10 vs 23) and body size (about 0.67 mm vs 0.42 mm). *Archisotoma arariboia* **sp. nov.** also differs by 1 thick and curved chaetae on trochanter and femur of leg III and 1–2 on femur and 1–2 on tibiotarsus of leg I, vs only 1 chaetae on trochanter and femur of leg III.

The species *A. litoralis* and *A. vaoensis* present a reduced maxillary capitulum, which is about half the length of internal lamella according to Thibaud & Palacios-Vargas (2001), while the new species *A. arariboia* **sp. nov.** has a unidentate maxillary capitulum that is subequal to internal lamella. In addition to that, *A. litoralis* exhibits only 2 chaetae between anterior trichobothria vs 4–5 in the new species.

The new species is similar to the Brazilian species *A. catiae* not only in the mentioned characteristics, but also due to maxillary capitulum morphology and number of chaetae between anterior trichobothria. In the other hand *A. arariboia* **sp. nov.** can be distinguished by the presence of 10 manubrium chaetae, 2-4 curved chaetae on leg I and 2 curved chaetae on leg III and larger body size.

Lastly, *A. arariboia* **sp. nov.** differs from *A. goubaultae* in relation to the following set of characteristics: eyes 6+6 vs 8+8, 10 manubrial chaetae vs 20–24, and number of chaetae between anterior trichobothria of 6 for the last species, according to Thibaud & Palacios-Vargas (2001).

It is noteworthy that the anterior trichobothria is four times longer than posterior trichobothria in *A. arariboia* **sp. nov.**, which is a diagnostic feature of the species since in all other taxa of the genus the difference in size is at most, two times longer.

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