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A new species of *Tyrannoseira* (Collembola: Entomobryidae: Seirini) from the Brazilian coastal region

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ABSTRACT. A new species of *Tyrannoseira* Bellini & Zeppelini, 2011 (Entomobryidae) is described and illustrated. Specimens of *T. diabolica* **sp. nov.** were collected in Barreira do Inferno, state of Rio Grande do Norte, Brazil. This is the fourth described species in the genus. All males of *Tyrannoseira* have the femora of the first pair of legs enlarged and slender tibiotarsi, both bearing several spine-like setae. Probably the closest species to *T. diabolica* **sp. nov.** is *T. sex* Bellini & Zeppelini, 2011. They share many similarities in their color pattern and dorsal chaetotaxy.

KEY WORDS. Brazilian collembolan diversity; edaphic mesofauna; Entomobryomorpha; Seirinae; taxonomy.

Seirini is one of the most diverse tribes in the Entomobryidae. Almost 270 species belong to this group, most of them in *Seira* Lubbock, 1869 (Bellinger *et al*. 1996-2011). The Seirini are predominantly tropical and preliminary studies have shown a potential high number of undescribed species of this tribe, especially in the Neotropical Region (Bellini & Zeppelini 2004, 2009). In fact, little is known about patterns of distribution of Entomobryidae and other collembolans in tropical areas, especially in Brazil (Mari-Mutt & Bellinger 1990, Abrantes *et al*. 2010).

There are 30 described species of Seirini in Brazil, represented by three genera: *Seira*, with 25 species; *Lepidosira* Schött, with two species; and *Tyrannoseira* Bellini & Zeppelini, 2011, with three species (Abrantes *et al*. 2010, Bellini *et al*. 2010, Bellini & Zeppelini 2011). Until now, all known species of *Tyrannoseira* were found in the "caatinga" biome and this condition makes it the only genus of Seirini endemic to Brazil (Bellini & Zeppelini 2011).

The morphology of *Tyrannoseira* resembles *Seira* in many aspects. Both genera have a similar overall dorsal habitus, with 8+8 lenses in the eyepatches, rounded scales with coarse ribs covering the body and a falcate mucro (Soto-Adames *et al*. 2008, Bellini & Zeppelini 2011). The most remarkable features found only in *Tyrannoseira* are in the first pair of male legs, which have highly enlarged femora and curved tibiotarsi, both with peculiar dispositions of spine-like setae (Zeppelini & Bellini 2006, Bellini & Zeppelini 2011). This morphology, associated to some elements of the dorsal chaetotaxy, makes *Tyrannoseira* unique among the Seirini (Bellini & Zeppelini 2011).

Herein we describe a new species of *Tyrannoseira* from the state of Rio Grande do Norte, Northeastern Brazil.

MATERIAL AND METHODS

The specimens were collected at Barreira do Inferno, municipality of Parnamirim, state of Rio Grande do Norte, Brazil, with pitfall traps, at the end of the dry season (February 2011). The specimens were mounted onto glass slides following the procedures described by Christiansen & Bellinger (1980).

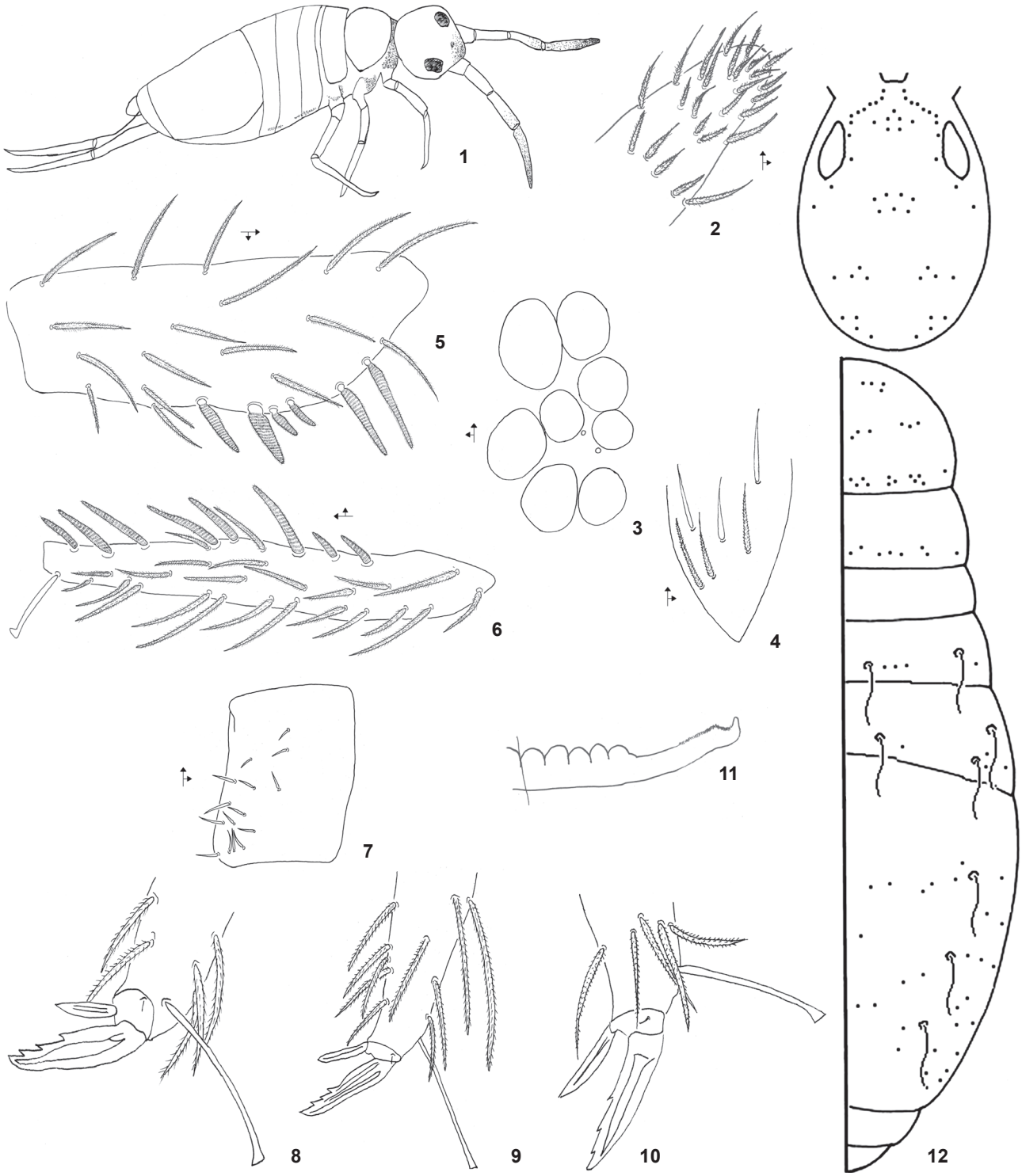
The chaetotaxy schemes follow the system of Christiansen & Bellinger (2000), which was modified from Jacquemart (1974). The type material of the new species is deposited at the Museu Nacional, Universidade Federal do Rio de Janeiro (CM/MNRJ/UFRJ).

TAXONOMY

Tyrannoseira diabolica **sp. nov.**

Figs 1-13

Total length of the holotype 1.42 mm. Habitus typically entomobryid (Fig. 1). Color of mounted specimens pale yellow with some dark blue pigment covering the third and fourth antennal segments, eyepatches, labrum area, lateral borders of meso- and metathorax and first three abdominal segments (Fig. 1). Yellowish to brownish rounded scales covering antennal segments I and II, basal halves of antennal segments III and IV, head, thorax, abdomen, legs and furca. Collophore without scales. Fourth antennal segment not annulated, without apical bulb or pin setae (Fig. 2). Eyepatches oval, 8+8 lenses, biggest lens A and smallest lens D, with two interocular feathered macrochaetae (Fig. 3). Pre-labral and labral setae smoth. Labial



Figures 1-12. *Tyrannoseira diabolica* **sp. nov.**: (1) habitus; (2) apical bulb of the 4th antennal segment; (3) left eyepatch; (4) setae of the labial triangle (right side); (5) male anterior femur; (6) male anterior tibiotarsus; (7) trochanteral organ; (8) first foot complex; (9) second foot complex; (10) third foot complex; (11) distal dens and mucro; (12) dorsal chaetotaxy of second and third abdominal segments.

triangle seta r absent and M1, M2 and E normal and feathered (Fig. 4). Femur of the first pair of legs heavily broadened in males, bearing six strong spines, with four of them grouped (Fig. 5). Tibiotarsus of the first pair of legs in males apically slender with one row bearing approximately eight elongated spine-like setae (Fig. 6). Trochanteral organ with approximately 15 short spine-like setae (Fig. 7). All ungues with three unpaired inner teeth (Figs 8-10). Unguiculi acuminate, with slightly serrated edges (Figs 8-10). Tenent hair capitate, smooth at the edges (Figs 8-10). Venter of manubrium with 5+5 subapical setae. No spine-like setae on manubrium. Mucro typically falcate (Fig. 11). No macrochaeta on first abdominal segment of adults, dorsal chaetotaxy of second and third abdominal segments as shown in Figure 12. Dorsal macrochaetae distribution on head and body as in Figure 13. Other characters are listed in Table I.

Material examined (CM/MNRJ/UFRJ). Holotype female: Brazil, *Rio Grande do Norte*: Parnamirim, Barreira do Inferno, 04-II-2011. Marques, M. coll. Paratypes: 10 females, 1 male, same data as holotype.

Etymology. The species was named after the type locality Barreira do Inferno (Hell's Barrier in English).

Remarks. *Tyrannoseira diabolica* **sp. nov.** was found in "Barreira do Inferno", a military protected area in the municipality of Parnamirim, state of Rio Grande do Norte. Within this area are located some spots of preserved "resting" forest, a subtype formation of the Atlantic Rainforest.

The specimens were collected at the end of the dry season (February 2011) on sand dune soil with dead foliage coverage. The climate of the area is 'As' according to Koeppen's system (Kottek *et al*. 2006), which means an equatorial hot climate with a distinct dry summer – wet winter precipitation regime.

Probably the closest species to *T. diabolica* **sp. nov.** is *Tyrannoseira sex* Bellini & Zeppelini, 2011. Both species share many similarities in the dorsal chaetotaxy, such as the number and disposition of macrochaetae in central head (3, 4 and 5 cephalic regions), regions 1A and 1B in mesothorax, regions A and B in metathorax, and abdominal segment 1. Both species also share a similar color pattern (Bellini & Zeppelini 2011). On the other hand, *T. diabolica* **sp. nov.** can be distinguished from the other species of *Tyrannoseira* by an unique combination of macrochaetae in cephalic regions 1, 2 and 6, region C of meso- and metathorax and abdominal segment IV. Other striking distinctive characters of *T. diabolica* **sp. nov.** are the reduced number of spines in the male femora (only six), the lack of 'r' seta in the labial triangle and the lack of the fourth ungual tooth.

Tyrannoseira diabolica **sp. nov.** is the fourth *Tyrannoseira* species described. The other three known species are restricted to the semi-arid "caatinga" biome, whereas *T. diabolica* **sp. nov.**

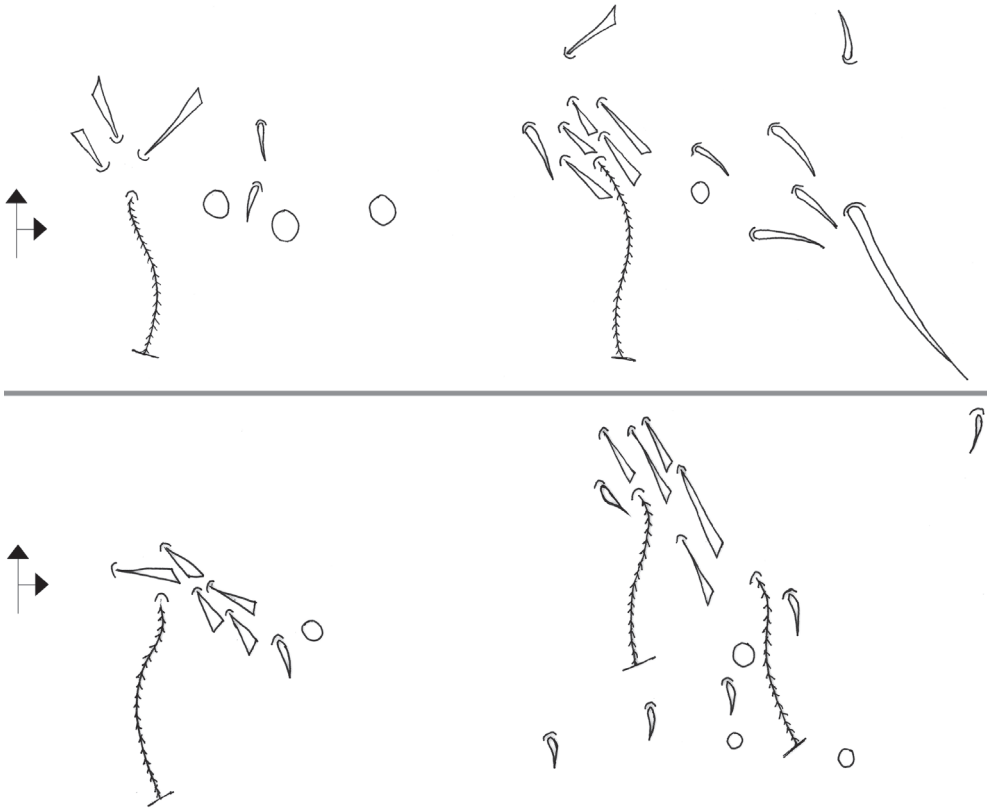


Figure 13. Dorsal macrochaetae distribution of *Tyrannoseira diabolica* **sp. nov.**

Table I. General features of *Tyrannoseira raptora* (Zeppelini & Bellini, 2006), *T. bicolorcornuta* (Bellini, Pais & Zeppelini, 2009), *T. sex* Bellini & Zeppelini, 2011, and *T. diabolica* **sp. nov.** (AC) Acuminate, (A) minor apical, (M+) larger medial, (+) present, (–) absent.

	T. raptora	*T. bicolorcornuta*	*T. sex*	*T. diabolica* **sp. nov.**
Lobes on antennal apical bulb	1	1	1	0
Annulations on 4th antennal segment	–	–	–	–
Ratio antenna/cephalic diagonal of the holotype	1.923	2.143	2.100	2.520
Unguiculus shape	AC	AC	AC	AC
Number of inner ungual teeth	4	4	4	3
Distinctly larger inner ungual tooth	M+, A-	–	M+, A-	–
Spine-like setae at base of dens	–	–	–	–
Number of ventral manubrial subapical setae	7	4	4	5
Presence of broadened femora in males	+	+	+	+
Presence of slender tibiotarsi in males	+	+	+	+
Macrochaetae on abdominal segment I	–	–	–	–

was collected in the Atlantic Rainforest, a different biome with a higher and more dense vegetation. The occurrence of *T. diabolica* **sp. nov.** in its type locality may be explained by a typical condition observed in Rio Grande do Norte: the "caatinga" covers more than 90% of the area of the state and its influence is also seen in areas covered by the Atlantic Rainforest (Araújo *et al.* 2005). As some plant species of the "caatinga" reach the coastline, it is expected that some animal taxa associated to the semi-arid can do the same.

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