

A new species of *Campylothorax* (Collembola: Entomobryoidea: Paronellidae) from the state of Alagoas, Brazil

Bruno Cavalcante Bellini^{1,2} & Liugo Fernando Meneses²

¹ Centro de Biociências, Departamento de Botânica, Ecologia e Zoologia, Universidade Federal do Rio Grande do Norte. Rodovia BR 101, Lagoa Nova, Campus Universitário, 59072-970 Natal, RN, Brazil. E-mail: entobellini@gmail.com

² Programa de Pós-graduação em Sistemática e Evolução, Centro de Biociências, Universidade Federal do Rio Grande do Norte.

ABSTRACT. *Campylothorax* Schött, 1893 is a genus of Paronellidae known only from the Neotropical and Ethiopian zoogeographic provinces. Herein a new species of this genus is described and illustrated. *Campylothorax mitrai* **sp. nov.** was found in remains of Atlantic Rainforest at Rio Largo municipality, state of Alagoas, Brazil. It is the ninth described species of *Campylothorax* and the third recorded from Brazil. *Campylothorax mitrai* **sp. nov.** can be distinguished from other species of the genus by its peculiar dark blue color pattern associated to a unique set of setae in the labial triangle, where there is a large distinct seta 'E'. This condition is unique among *Campylothorax* species. *Campylothorax mitrai* **sp. nov.** is the first record of Collembola from Alagoas.

KEY WORDS. Atlantic Rainforest biodiversity; edaphic mesofauna; Paronellinae; Paronellini; taxonomy.

Paronellidae is one of the most familiar groups of epiedaphic Collembola in the tropics (MARI-MUTT 1987, HOPKIN 1997). Species of this family are characterized by long appendages (especially the antennae and furca), fourth abdominal segment elongated, smooth cylindrical dens, and mucro without setae (CHRISTIANSEN & BELLINGER 1980, BELLINGER *et al.* 1996-2012). Many forms show a very distinct color pattern, which helps to recognize the species (HOPKIN 1997).

There are approximately 460 described species of Paronellidae worldwide, which represent less than 6% of all known Collembola (HOPKIN 1997, BELLINGER *et al.* 1996-2012). The family comprises two subfamilies, Paronellinae and Cyphoderinae (SOTO-ADAMES *et al.* 2008). Many species of Paronellinae are found in tropical rain forests and caves, whereas most known Cyphoderinae are associated with nests of social insects in tropical and temperate latitudes (HOPKIN 1997). Currently, there are 25 valid genera of Paronellinae and 12 of Cyphoderinae (SOTO-ADAMES *et al.* 2008, BELLINGER *et al.* 1996-2012).

In Brazil the knowledge of Paronellidae is still insufficient. Only 15 species have been recorded for the country and at least two genera, *Paronella* Schött, 1893 and *Lepidonella* Yosii, 1960 have dubious records for the country (BELLINI & ZEPPELINI 2004, 2009, ABRANTES *et al.* 2010, 2012). Currently the largest genus of Paronellidae in Brazil is *Trogolaphysa* Mills, 1938 with five recorded species (ABRANTES *et al.* 2012).

Campylothorax Schött, 1893 is a genus of Paronellinae that currently includes eight described species. This genus is known only from the Neotropical and Ethiopian zoogeographic provinces (MITRA & DALLAI 1980, BELLINGER *et al.* 1996-2012). Species of *Campylothorax* are easily recognized by the presence of very

long antennae, scales on the body, and a typical, strongly bent metathorax (MITRA & DALLAI 1980, BELLINGER *et al.* 1996-2012). In Brazil, only two species have been recorded, *Campylothorax cassagnaus* Mitra & Dallai, 1980 and *Campylothorax schaefferi* Börner, 1906. None of them has been found in northeastern Brazil until this moment (ABRANTES *et al.* 2010, 2012).

Herein we describe a new species of *Campylothorax* from the state of Alagoas, northeastern Brazil.

MATERIAL AND METHODS

The specimens were collected with pitfall traps in remains of Atlantic Rainforest at Rio Largo municipality, state of Alagoas, Brazil, during the dry season (November 2010). They were mounted on glass slides following the procedures described by CHRISTIANSEN & BELLINGER (1980).

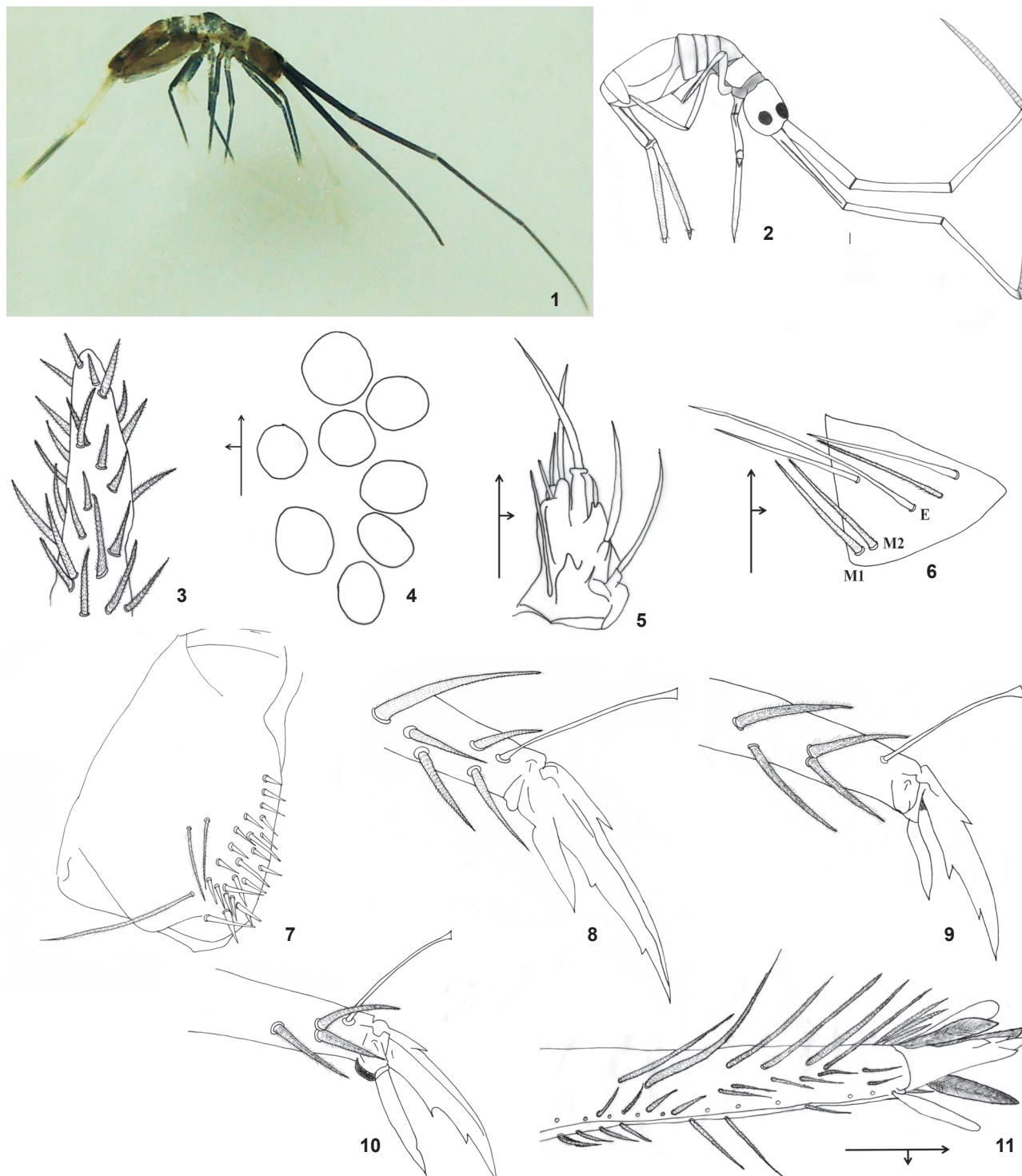
The chaetotaxy schemes and drawings follow MARI-MUTT (1987) and MITRA (1993). Type material is deposited at Museu Nacional, Universidade Federal do Rio de Janeiro (CM/MNRJ/UFRJ).

TAXONOMY

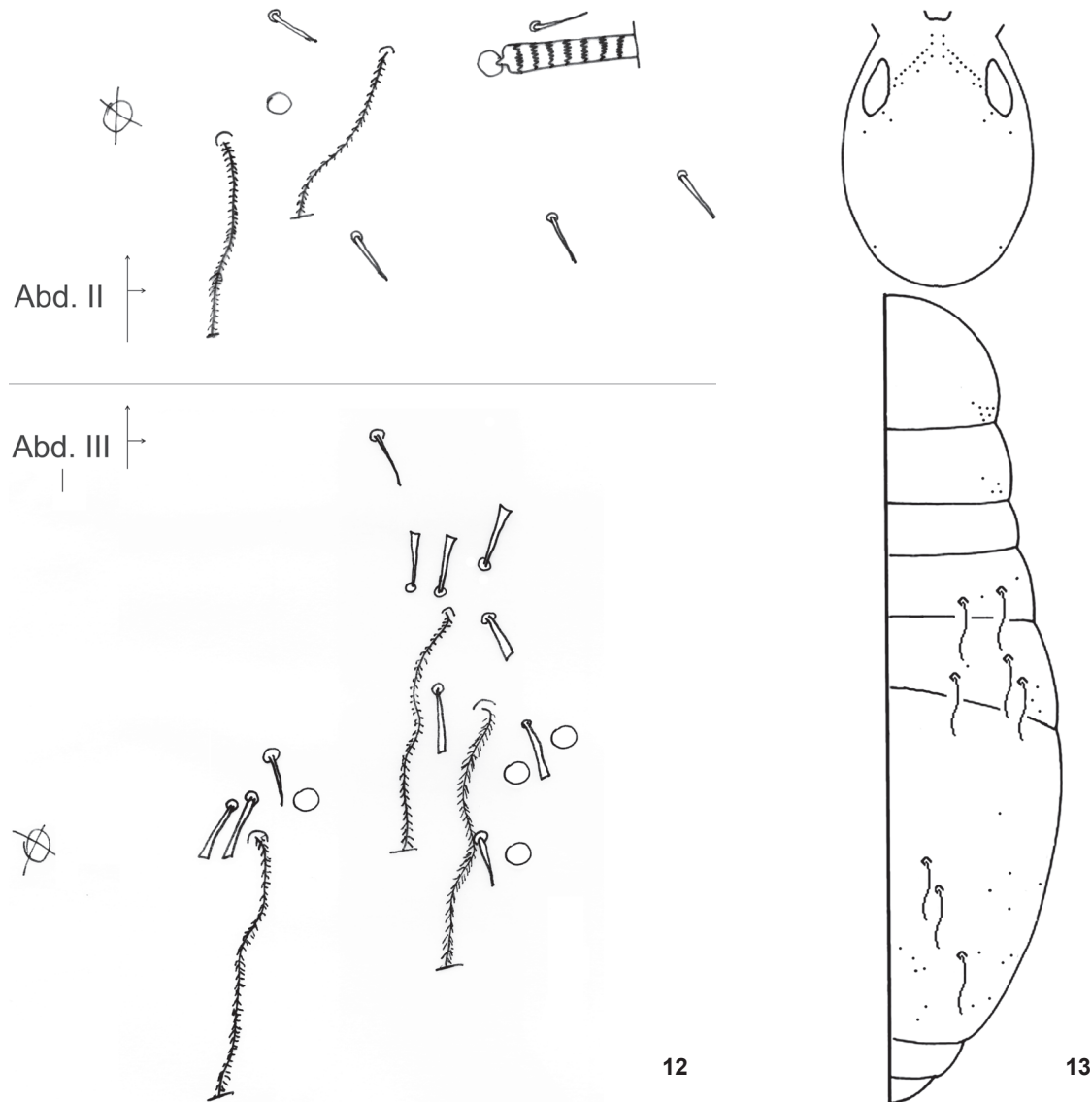
Campylothorax mitrai **sp. nov.**

Figs 1-13

Total length (body and head) of the holotype 2.22 mm. Habitus typical of *Campylothorax* (Figs 1 and 2). Color of fixed specimens predominantly dark blue, with some brown pigment covering ventral areas of head and body; manubrium and distal dens without pigment (Fig. 1). Brownish to hyaline rounded



Figures 1-11. (1) Fixed specimen of *Campylothorax mitrai* sp. nov.; (2) habitus with scale; (3) apical region of the antennal segment IV; (4) left eyepatch; (5) right labial palp; (6) setae of the labial triangle (right side); (7) trochanteral organ; (8) first foot complex; (9) second foot complex; (10) third foot complex; (11) distal dens and mucro. Scale bar = 100 μ m.



Figures 12-13. *Campylothorax mitrai* sp. nov., dorsal chaetotaxy of second and third abdominal segments (circles represent macrochaetae, as shown in abd. II); (13) dorsal macrochaetae distribution.

scales covering antennal segments I and II, basal halves of antennal segments III and IV, head, thorax, abdomen, legs, and furca. Collophore without scales. Antennal segment IV not annulated, without apical bulb or pin setae (Fig. 3). Eyepatches oval, 8+8 lenses, biggest lens A and smallest lens D (Fig. 4). Pre-labral and labral setae feathered. Labial palp as in figure 5. Labial triangle seta *r* absent, M1, M2 feathered and E smooth and larger than other setae (Fig. 6). Trochanteral organ as in figure 7, with 17 to 24 short spine-like setae. All ungues with two unpaired inner teeth (Figs 8-10). Unguiculi acuminate, with smooth edges (Figs 8-10). Tenent hair capitate, smooth at edges (Figs 8-

10). Venter of manubrium with 7+7 subapical setae. No spine-like setae on manubrium or dens. Mucro typically elongated with three apical teeth and one basal tooth (Fig. 11). Dorsal chaetotaxy of second and third abdominal segments as in figure 12. Dorsal macrochaetae distribution on head and body as in figure 13.

Material examined. Holotype male, BRAZIL, Alagoas: Rio Largo (Universidade Federal de Alagoas, Centro de Ciências Agrárias), 19-XI-2010, I.P.S. Santos *leg.* Paratypes: 6 females and 2 males, same data as the holotype.

Etymology. The species was named after Dr. Saral Kumar Mitra, one of the most renowned specialists of the Paronellidae.

DISCUSSION

Campylothorax mitrai sp. nov. was collected in the Federal University of Alagoas, in Rio Largo campus, within an area of preserved Atlantic Rainforest. The finding of *C. mitrai* sp. nov. inside a tropical forest area is consistent with data on most epiedaphic Paronellinae, which have been found in similar conditions (MARI-MUTT 1987, HOPKIN 1997).

The specimens were collected at the peak of the dry season, associated with soil and dead foliage coverage. The climate in Rio Largo municipality 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.

Most species of *Campylothorax* can be distinguished by their unique color patterns (MITRA & DALLAI 1980, MARI-MUTT 1987). Accordingly, *C. mitrai* sp. nov. can be easily separated from other Brazilian species of *Campylothorax* by its dark coloration (Fig. 1), which contrasts with the predominantly pale color of *C. cassagnaus* and *C. schaefferi* (BÖRNER 1906, MITRA & DALLAI 1980, BELLINGER *et al.* 1996-2012). Two other species of dark pigmented *Campylothorax* have been recorded from the Neotropical region, *Campylothorax sabanus* (Wray, 1953) and *Campylothorax cubanus* Gruiá, 1983 (MARI-MUTT 1987). However, the coloration of both species does not match exactly the pattern seen in *C. mitrai* sp. nov. (especially in the abdominal segments) and the latter shows a very divergent chaetotaxy in the labial triangle (Fig. 6). In fact, a large distinct seta 'E' has not been recorded in any other species of the genus.

Campylothorax mitrai sp. nov. is the first record of Collembola from the state of Alagoas (ABRANTES *et al.* 2010, 2012). While many efforts are being made to unveil the collembolan fauna of Brazil, this kind of data reinforces the need for more taxonomists working on the group.

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LITERATURE CITED

- ABRANTES, E.A.; B.C. BELLINI; A.N. BERNARDO; L.H. FERNANDES; M.C. MENDONÇA; E.P. OLIVEIRA; G.C. QUEIROZ; K.D. SAUTTER; T.C. SILVEIRA & D. ZEPPELINI. 2010. Synthesis of Brazilian Collembola: an update to the species list. *Zootaxa* 2388: 1-22.
- ABRANTES, E.A.; B.C. BELLINI; A.N. BERNARDO; L.H. FERNANDES; M.C. MENDONÇA; E.P. OLIVEIRA; G.C. QUEIROZ; K.D. SAUTTER; T.C. SILVEIRA & D. ZEPPELINI. 2012. Errata Corrigenda and update for the "Synthesis of Brazilian Collembola: an update to the species list." ABRANTES *et al.* (2010), *Zootaxa*, 2388: 1-22. *Zootaxa* 3168: 1-21.
- BELLINGER, P.F.; K.A. CHRISTIANSEN & F. JANSSENS. 1996-2012. Checklist of the Collembola of the World. Available online at: <http://www.collembola.org>. [Accessed: February 2012].
- BELLINI, B.C. & D. ZEPPELINI. 2004. First records of Collembola (Ellipura) from the State of Paraíba, Northeastern Brazil. *Revista Brasileira de Entomologia* 48 (4): 587-588.
- BELLINI, B.C. & D. ZEPPELINI. 2009. Registros da fauna de Collembola (Arthropoda, Hexapoda) no Estado da Paraíba, Brasil. *Revista Brasileira de Entomologia* 53 (3): 386-390.
- BÖRNER, C. 1906. Das System der Collembolen nebst Beschreibung neuer Collembolen des Hamburger Naturhistorischen Museums. *Mitteilungen aus den Naturhistorischen Museum in Hamburg* 23: 147-188.
- CHRISTIANSEN, K. & P. BELLINGER. 1980. *The Collembola of North America north of the Rio Grande*. Grinnell, Grinnell College, 1322p.
- HOPKIN, S.P. 1997. *Biology of the Springtails (Insecta: Collembola)*. Oxford, Oxford University Press, 330p.
- KOTTEK, M.; J. GRIESER; C. BECK; B. RUDOLF & F. RUBEL. 2006. World map of the Köppen-Geiger climate classification updated. *Meteorologische Zeitschrift* 15 (3): 259-263.
- MARI-MUTT, J.A. 1987. Puerto Rican species of Paronellidae (Insecta: Collembola). *Caribbean Journal of Science* 23 (3-4): 400-416.
- MITRA, S.K. 1993. Chaetotaxy, phylogeny and biogeography of Paronellinae (Collembola: Entomobryidae). *Records of the Zoological Survey of India, Occasional Paper* 154:1-100.
- MITRA, S.K. & R. DALLAI. 1980. Studies of the genus *Campylothorax* Schött, 1893 (Collembola Entomobryidae, Paronellinae) with the description of a new species from Zaire. *Monitore Zoologico Italiano* 13 (9): 273-321.
- SOTO-ADAMES, F.N.; J.A. BARRA; K. CHRISTIANSEN & R. JORDANA. 2008. Suprageneric classification of Collembola Entomobryomorpha. *Annals of the Entomological Society of America* 101 (3): 501-513.

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