



<http://dx.doi.org/10.11646/zootaxa.3764.2.2>

<http://zoobank.org/urn:lsid:zoobank.org:pub:5F7C20C1-B198-4C1E-9FDB-159B4EE862BE>

## Three new species of *Seira* Lubbock (Collembola, Entomobryidae) from Caatinga Domain, northeastern Brazil

NERIVANIA N. GODEIRO<sup>1,3</sup> & BRUNO C. BELLINI<sup>1,2</sup>

<sup>1</sup>Programa de Pós-Graduação em Sistemática e Evolução. Centro de Biociências, Departamento de Botânica, Ecologia e Zoologia, Universidade Federal do Rio Grande do Norte, Campus Universitário Lagoa Nova, CEP 59072–970, Natal, Rio Grande do Norte, Brasil. E-mail: nerivania@gmail.com

<sup>2</sup>Centro de Biociências, Departamento de Botânica, Ecologia e Zoologia, Universidade Federal do Rio Grande do Norte, Campus Universitário Lagoa Nova, CEP 59072–970, Natal, Rio Grande do Norte, Brasil

<sup>3</sup>Corresponding author

### Abstract

Three new species of *Seira* Lubbock, *Seira jiboiensis* sp.nov., *Seira primaria* sp. nov. and *Seira harena* sp.nov. from Neotropical Region are described and illustrated. All species were collected from humid areas of Caatinga Biogeographic Domain, northeastern Brazil. *Seira jiboiensis* sp.nov. shows some similarities with *S. mendoncea* Bellini & Zeppelini and *S. ritae* Bellini & Zeppelini, while *S. primaria* sp.nov. resembles *S. pseudoannulata* Bellini & Zeppelini and *S. paraibensis* Bellini & Zeppelini in dorsal chaetotaxy in some aspects. *Seira harena* sp.nov. belongs to a subgroup of *Seira* originally described in the subgenus *Lepidocyrtinus* Börner, which has modified macrochaetae on distal manubrium and proximal dens, like *S. prodiga* (Arlé), *S. xinguensis* (Arlé) and *S. nigrans* (Arlé).

**Key words:** semi-arid localities, dorsal chaetotaxy, Neotropical Region, Seirini, taxonomy

### Introduction

Knowledge of the collembolan fauna of northeastern Brazil is still sparse, but has improved in recent years. The best known states in the northeast are Paraíba and Rio Grande do Norte (Bellini & Zeppelini 2009b, Santos-Rocha *et al.* 2011) (Fig. 1). Here, the genus *Seira* Lubbock (Entomobryidae) is most diverse. In Brazil, the genus is represented by 24 described species (Table 1), comprising 8.2% of all known species in the genus in the country (Abrantes *et al.* 2010, 2012, Bellini *et al.* 2010, Bellini & Zeppelini 2011a, Bellini & Godeiro 2012, Zeppelini & Lima 2012, Zeppelini & Silva 2012, Mendonça *et al.* 2012, Godeiro & Bellini 2013).

Analysis of the dorsal chaetotaxy indicates a closer relation of *Seira* to *Entomobrya* Rondani and *Lepidocyrtus* Bourlet (Szeptycki 1979, Soto-Adames 2008). However, *Seira* can be readily distinguished from these two genera by the presence of a falcate mucro, clearly striated scales covering the dorsal body and appendages, 8+8 (or fewer, commonly 7+7) eyes lenses, and in most species, the presence of three trichobothria on the fourth abdominal segment (Soto-Adames *et al.* 2008, Bellini & Zeppelini 2011b).

We describe here three new species of *Seira* from different areas of Caatinga Phytogeographic Domain, in northeastern Brazil. The specimens were collected in Santa Terezinha municipality (Bahia State); Crato municipality (Ceará State); and Areia municipality (Paraíba State) (Fig. 1). All specimens were cleared with hydrochloric acid, potassium dichromate and mounted in glass slides in Hoyer medium (following Bellinger *et al.* 1996–2013). The detailed chaetotaxic schemes follow Soto-Adames (2008). The dorsal macrochaetal nomenclature follows Jacquemart (1974), as modified by Christiansen & Bellinger (2000).

**Abbreviations.** Abd.—abdominal segment, Ant.—antennal segment, Th.—thoracic segment. DBEZ/UFRN—Department of Botany, Ecology and Zoology of Federal University of Rio Grande do Norte, Brazil (Departamento de Botânica, Ecologia e Zoologia da Universidade Federal do Rio Grande do Norte, Brasil).

## Acknowledgements

Tomaz Gonzaga helped with the illustrations. The second author was funded by the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) and Programa de Pesquisa em Biodiversidade (PPBio).

## References

- Abrantes, E.A., Bellini, B.C., Bernardo, A.N., Fernandes, L.H., Mendonça, M.C., Oliveira, E.P., Queiroz, G.C., Sautter, K.D., Silveira, T.C. & Zeppelini, D. (2010) Synthesis on Brazilian Collembola: an update to the species list. *Zootaxa*, 2388, 1–22.
- Abrantes, E.A., Bellini, B.C., Bernardo, A.N., Fernandes, L.H., Mendonça, M.C., Oliveira, E.P., Queiroz, G.C., Sautter, K.D., Silveira, T.C. & Zeppelini, D. (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.
- Arlé, R. (1959) Collembola Arthropleona do Brasil oriental e central. *Separata dos arquivos do Museu Nacional*, 49, 155–211.
- Bellinger, P.F., Christiansen, K.A. & Janssens, F. (1996–2013) Checklist of the Collembola of the World. Available from: [www.collembola.org](http://www.collembola.org) (accessed 09 September 2013)
- Bellini, B.C. & Godeiro, N.N. (2012) A new species of *Tyrannoseira* (Collembola: Entomobryidae: Seirini) from the Brazilian coastal region. *Zoologia*, 29 (1), 81–84.  
<http://dx.doi.org/10.1590/s1984-46702012000100010>
- Bellini, B.C. & Zeppelini, D. (2008a) A new species of *Seira* (Collembola: Entomobryidae) from northeastern Brazil. *Revista Brasileira de Zoologia*, 25 (4), 724–727.  
<http://dx.doi.org/10.1590/s0101-81752008000400018>
- Bellini, B.C. & Zeppelini, D. (2008b) Three new species of *Seira* Lubbock (Collembola, Entomobryidae) from Mataraca, Paraíba State, Brazil. *Zootaxa*, 54, 44–54.
- Bellini, B.C. & Zeppelini, D. (2009a) A new species of *Seira* Lubbock (Collembola, Entomobryidae), with a key to the species of Paraíba, Brazil. *Revista Brasileira de Entomologia*, 53 (2), 266–271.  
<http://dx.doi.org/10.1590/s0085-56262009000200008>
- Bellini, B.C. & Zeppelini, D. (2009b) Registros da fauna de Collembola (Arthropoda, Hexapoda) no Estado da Paraíba, Brasil. *Revista Brasileira de Entomologia*, 53 (3), 386–390.  
<http://dx.doi.org/10.1590/s0085-56262009000300012>
- Bellini, B.C., Fernandes, L.H. & Zeppelini, D. (2010) Two new species of *Seira* (Collembola, Entomobryidae) from Brazilian coast. *Zootaxa*, 2448, 53–60.
- Bellini, B.C. & Zeppelini, D. (2011a) A new species of *Seira* (Collembola: Entomobryidae: Seirini) from the Northeastern Brazilian coastal region. *Zoologia*, 28, 403–406.  
<http://dx.doi.org/10.1590/s1984-46702011000300015>
- Bellini, B.C. & Zeppelini, D. (2011b) New genus and species of Seirini (Collembola, Entomobryidae) from Caatinga Biome, Northeastern Brazil. *Zoosystema*, 33 (4), 545–555.  
<http://dx.doi.org/10.5252/z2011n4a6>
- Christiansen, K.A. & Bellinger, P. (2000) A Survey of the Genus *Seira* (Hexapoda: Collembola: Entomobryidae). *Caribbean Journal of Science*, 36 (1–2), 39–75.
- Godeiro, N.N. & Bellini, B.C. (2013) A new species of *Seira* (Collembola: Entomobryidae) from the state of Paraíba, Brazil. *Zoologia*, 30 (3), 343–345.  
<http://dx.doi.org/10.1590/s1984-46702013000300014>
- Jacquemart, S. (1974) Resultats de la mission Anthropologique Belge au Niger. Collemboles nouveaux du Sahara. *Bulletin de l'Institut royal des Sciences naturelles de Belgique*, 50 (6), 1–46.
- Kottek, M., Grieser, J., Beck, C., Rudolf, B. & Rubel, F. (2006) World Map of the Köppen-Geiger climate classification updated. *Meteorologische Zeitschrift*, 15, 259–263.  
<http://dx.doi.org/10.1127/0941-2948/2006/0130>
- Mendonça, M.C., Abrantes, E.A. & Neves, A.C.R. (2012) New species of *Isotomiella* Bagnall, 1939 from southeast of Brazil (Collembola, Isotomidae). *ZooKeys*, 233, 21–30.  
<http://dx.doi.org/10.3897/zookeys.233.3553>
- Santos-Rocha, I.M., Andreazze, R. & Bellini, B.C. (2011) Registros de Collembola (Arthropoda, Hexapoda) no Estado do Rio Grande do Norte, Brasil. *Biota Neotropica*, 11 (3), 0–4.  
<http://dx.doi.org/10.1590/s1676-06032011000300013>
- Soto-Adames, F.N. (2008) Postembryonic development of the dorsal chaetotaxy in *Seira downlingi* (Collembola, Entomobryidae); with an analysis of the diagnostic and phylogenetic significance of the primary chaetotaxy in *Seira*. *Zootaxa*, 1683, 1–31.
- Soto-Adames, F.N., Barra, J.A., Christiansen, K. & Jordana, R. (2008) Suprageneric Classification of Collembola Entomobryomorpha. *Annals of the Entomological Society of America*, 101, 501–513.

[http://dx.doi.org/10.1603/0013-8746\(2008\)101\[501:scoce\]2.0.co;2](http://dx.doi.org/10.1603/0013-8746(2008)101[501:scoce]2.0.co;2)

Yosii, R. (1959) Collembolan fauna of Cape Province with special reference to the genus *Seira* Lubbock. *Biological Results of the Japanese Antarctic Research Expedition*, 6, 3–23.

Zeppelini, D. & Lima, E.C.A. (2012) A new species of *Tyrannoseira* (Collembola, Entomobryidae, Seirini) from Paraiba, Northeastern Brazil. *Zootaxa*, 3423, 36–44.

Zeppelini, D. & Silva, D.D. (2012) A new *Stenognathriopes* (Collembola, Symphypleona, Bourletiellidae) from Brazilian coast. *Zootaxa*, 3540, 51–58.