



## Description and phylogenetic position of a new *Willemia* species (Collembola: Hypogastruridae) from the littoral coast of Brazil

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### Abstract

A new psammobiontic *Willemia* species from Brazil is described and illustrated: *W. zeppelini* sp. nov. The phylogeny for all the 43 species of the genus *Willemia* is proposed comprising the new species and 8 species not included in D'Haese (2000) work. The new species is well defined with a unique Ant. III organ and one hr chaeta per anal valve among other characters. *W. zeppelini* is sister group to the *buddenbrocki*-group. An identification key for all known species of the genus is provided.

**Key words:** Poduromorpha, new species, phylogeny, neotropics, littoral sand, identification key

### Introduction

The hypogastrurid genus *Willemia* was dubbed by Börner in 1901 for *W. anophthalma*. Since the original description, about three dozens of species have been described during the twentieth century making this genus one of the four hypogastrurid genera with more than 30 species. Within the genus, some synthetic work has been done with the revisions of the *Willemia anophthalma*-group, including 8 species at the time (D'Haese 1998) and the *W. budenbrocki*-group, including 10 species at the time (D'Haese & Weiner 1998) and a general overview of palearctic *Willemia* (Thibaud *et al.* 2004) with an identification key for 25 holarctic species including 17 palearctic species. A phylogeny of the genus was proposed by D'Haese (2000) based on 52 morphological characters for 34 species. Since the phylogeny of the genus was published, 6 new species were described.

In this work, we describe a new species found in sandy habitats from the littoral coast of Brazil. The new species, along with two species not taken into account in previous phylogenetic work and the 6 species described since 2000, were coded for the 52 morphological characters found in D'Haese (2000) and the resulting phylogeny is proposed. Finally, an identification key for all the species of the genus is provided.

### Material and methods

Specimens were collected by washing sand with water. They were preserved in 95% ethanol then cleared in successive 10% potassium hydroxide solution and Amman's lactophenol (lactic acid glycerol-phenol: 25–50–25) and finally mounted on microscope slides using Marc André II mounting medium. Specimens were examined using a compound microscope with differential interference contrast optics at magnifications ranging from 250 to 1000. Drawings were made with a drawing tube. Material is deposited in the 'Apterygota' collection of the Museum National d'Histoire Naturelle (MNHN), Paris, France.

**Abbreviations:** Abd.—abdomen segment, Ant.—antennal segment, hr—anal valve microchaetae, Sx—Ant. IV s-chaetae (=sensilla) (where x range from 0 to 9), ab—apical bulb, ms—microsensillum, so—subapical organite, nomenclature after D'Haese (2003).

Nine species have been coded for 52 morphological characters and added to the data matrix work published by D'Haese (2000): *Willemia bulbosa*, Bonet, 1945, *W. acantha* Bonet, 1945, *W. unispina* Fjellberg, 2007, *W. iztacci-*