



## Re-discovery after more than a century: a redefinition of the Malagasy endemic millipede genus *Zehntnerobolus*, with a description of a new species (Diplopoda, Spirobolida, Pachybolidae)

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### Abstract

A new species of the previously monotypic Malagasy pachybolid genus *Zehntnerobolus* Wesener, 2009, *Z. hoffmani* **new species**, is described. The diagnosis of the genus *Zehntnerobolus* is updated and new characters of potential phylogenetic importance for the classification of Malagasy Spirobolida are described. The here described specimens are the first known representatives of *Zehntnerobolus* collected since 1900. The late discovery of another *Zehntnerobolus* is a clear indication of how little we know about the soil arthropod macrofauna of Madagascar. Particularly the eastern rainforest region and the north of Madagascar are still underexplored. The specimens were collected in the eastern montane rainforest more than 380 km south of the known distribution of the other *Zehntnerobolus* species. The collection method used, as well as morphological parameters of *Zehntnerobolus* indicate that its species live in the leaf litter of Malagasy rainforests.

**Key words:** Madagascar, endemic, re-discovery, soil arthropod, montane rainforest

### Introduction

Madagascar, the world's third largest island, is famous for its large number of endemic animals (e.g. Vietes *et al.* 2009) and plants (see Goodman and Benstead 2005). The millipede fauna of Madagascar is no exception, with a high number of endemic species and genera (Enghoff 2003). Among the most fascinating invertebrates of the island are, due to their large size and often intriguing color pattern, the giant pill-millipedes (order Sphaerotheriida) and millipedes of the order Spirobolida.

Until 2008, only two indigenous Spirobolida genera, *Aphistogoniulus* Silvestri, 1897 and *Spiromimus* de Saussure & Zehntner, 1901, both belonging to the family Pachybolidae (Hoffman 1980), were known from Madagascar (Enghoff 2003). The genus *Aphistogoniulus* includes the large-bodied (120–200 mm long) black/red/gold colored fire millipedes of the subfamily Pachybolinae (see Wesener *et al.* 2009A for a revision), while the genus *Spiromimus* includes small to medium-sized species (up to 90 mm long) and forms the monotypic subfamily Spiromiminae with potential relationships to genera found in India (see Wesener and Enghoff 2009 for a revision).

Since 2008, 50 new species and 13 new genera of Spirobolida (Wesener *et al.* 2008, Wesener and Enghoff 2009, Wesener *et al.* 2009A, 2009B) have been described from Madagascar, bringing the total number of indigenous genera to 15, all of them strict Malagasy endemics (not occurring on neighbouring islands such as the Comoros [VandenSpiegel and Golovatch 2007]). All but one of the genera (*Hylekobolus*, Spirobolellidae) belong to the family Pachybolidae (*sensu* Hoffman 1980), a family displaying a Gondwanan distribution with genera occurring in Australia, SE Asia, India, Africa, and South America (Wesener *et al.* 2008). With 14 genera of the family restricted to Madagascar, the diversity of Pachybolidae on Madagascar surpasses that of India, South America and Australia combined. Madagascar is also host to the forest with the worldwide highest Spirobolida diversity: six genera live in the south-eastern littoral forest of Sainte Luce (Wesener *et al.* 2009b). The relationships of most of these endemic pachybolid genera are, with some exceptions (Wesener *et al.* 2008, Wesener and Enghoff 2009, Pitz and Sierwald 2010), still unknown. Of the 13 genera recently described from Madagascar, only one (*Zehntnerobolus* Wesener, 2009) was based on a previously described species, *Spirobolus* (*Spirostrophus*) *rubripes* deSaussure