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Tardigrades from Peru (South America), with descriptions of three new species of Parachela

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Abstract

In four samples of mosses and mosses mixed with lichens collected in the Peruvian region of Cusco, 344 tardigrades, 78 free-laid eggs and six simplexes were found. In total, nine species were identified: *Cornechiniscus lobatus*, *Echiniscus dariae*, *E. ollantaytamboensis*, *Isohypsibius condorcanquii* **sp. nov.**, *Macrobiotus pisacensis* **sp. nov.**, *Milnesium krzysztofi*, *Minibiotus intermedius*, *Paramacrobiotus intii* **sp. nov.** and *Pseudechiniscus ramazzottii ramazzottii*. *Isohypsibius condorcanquii* **sp. nov.** is most similar to *I. baldii*, but differs mainly by the absence of ventral sculpture, the presence of the oral cavity armature, a different macroplacoid length sequence and a different shape of macroplacoids. The new species also differs from other congeners by a different dorsal sculpture, the absence of cuticular bars under the claws and the absence of eyes. *Macrobiotus pisacensis* **sp. nov.** differs from the most similar *M. ariekammensis* and *M. kirghizicus* by a different oral cavity armature, the presence of cuticular pores, details of egg morphology and some morphometric characters of both animals and eggs. *Paramacrobiotus intii* **sp. nov.** differs from most similar species of the genus by a different type of the oral cavity armature, details of egg morphology and some morphometric characters of both animals and eggs. In addition, we briefly discuss the tardigrade fauna of Peru, and propose a simple and economic system of describing relative lengths of pharyngeal macroplacoids. The system is especially useful in interspecific comparisons and differential diagnoses.

Key words: invertebrates, *Isohypsibius condorcanquii* **sp. nov.**, *Macrobiotus pisacensis* **sp. nov.**, macroplacoid length sequence, moss fauna, new records, Neotropic, *Paramacrobiotus intii* **sp. nov.**, Tardigrada, taxonomy, water bears

Introduction

Peru covers almost 1.3 million km² of western South America and thus it is a part of the Neotropic ecozone (Holt *et al.* 2013). Geographically, Peru is divided into three distinct regions: *costa* (coast)—narrow plains with seasonal rivers on the Pacific coast, *sierra* (highlands)—mainly the Andes and the Altiplano plateau, and *selva* (jungle)—a wide and flat region covered by the Amazon rainforest (this region comprises *ca.* 60% of Peru's territory). All samples examined in this study were collected in the Cusco Region, which is situated in the Andean highlands (*sierra*). The climate in this region is generally dry and temperate, *i.e.* according to the Köppen climate classification (Peel *et al.* 2007) it is described as a subtropical highland climate with two defined seasons: dry and wet.

The Phylum Tardigrada consists currently of *ca.* 1,200 species (Degma *et al.* 2009–2013, Vicente & Bertolani 2013) that inhabit terrestrial and aquatic (freshwater and marine) environments throughout the world (Ramazzotti & Maucci 1983). Our knowledge of the diversity and distribution of Peruvian water bears is very limited and to date only 21 taxa have been reported from this region (Murray 1913, Marcus 1939, Nelson 1982, Binda & Pilato 1995, Pilato *et al.* 2000, Nickel *et al.* 2001, Pilato *et al.* 2001, Michalczyk & Kaczmarek 2003a, 2004, Pilato *et al.*

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