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The genus *Milnesium* (Tardigrada: Eutardigrada: Milnesiidae) in the Great Smoky Mountains National Park (North Carolina and Tennessee, USA), with the description of *Milnesium bohleberi* sp. nov.

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Abstract

For many decades the genus *Milnesium* was thought to consist of a single, cosmopolitan species: *Milnesium tardigradum* Doyère, 1840. However, recently the genus has been re-evaluated, and numerous new species have been described. Currently, over twenty extant species and one fossil are recognised, and most appear to have very narrow geographic ranges. It is doubtful that *M. tardigradum* sensu stricto is truly cosmopolitan, but to evaluate this hypothesis, specimens previously identified as *M. tardigradum* must be re-examined using newly proposed taxonomic characters. As part of the All Taxa Biodiversity Inventory (ATBI) we collected *Milnesium* specimens from various locations in the Great Smoky Mountains National Park (GSMNP). Two *Milnesium* species have been evaluated, and one of them, *Milnesium bohleberi* sp. nov., is new to science. The new species is most similar to *M. eurystomum* but differs by shorter claws and a shorter, narrower, and more cylindrical buccal tube. The other *Milnesium* species, very rare in our collection, is morphologically indistinguishable from *Milnesium granulatum* Ramazzotti 1962, which was previously known only from Chile, Italy and Romania. Based on the recently revised description of *M. tardigradum* sensu stricto, this nominal species for the genus has not been found in the GSMNP samples.

Key words: *M. granulatum* group, *M. tardigradum* sensu stricto, new species, rare species, species distributions, taxonomy, zoogeography

Introduction

The species in the genus *Milnesium* are the largest (occasionally even longer than 2 mm) and exclusively carnivorous tardigrades in limno-terrestrial and interstitial communities (Guil 2008). They have been recorded from all continents (Michalczyk *et al.* 2012a,b), and one is also known from Cretaceous amber (Bertolani & Grimaldi 2000). The genus is widespread, thus it is quite likely that *Milnesium* sp. was among the first tardigrades ever observed (Goeze 1773, Spallanzani 1777). Until recently, *Milnesium tardigradum* Doyère, 1840 was the only recognised species in the genus, and it had long been considered cosmopolitan (*e.g.* Ramazzotti & Maucci 1983, Tumanov 2006).

Beginning with Binda & Pilato (1990), new *Milnesium* species were described. Recently, Michalczyk *et al.* (2012a,b) re-described the nominal species and recognised 17 extant species in the genus. Following this, three additional new species were described by Meyer & Hinton 2012, Kaczmarek *et al.* 2012b and Meyer *et al.* 2013. The majority of the 19 newly described species are known only from their type localities, and Michalczyk *et al.* (2012a,b) hypothesised that *Milnesium t. tardigradum* will lose its cosmopolitan status as specimens from various localities are re-examined in light of new taxonomic characters. It seems likely that many of the new species have truly restricted geographic ranges, but this too will only be known with more extensive investigations.

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