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Two new tardigrade species from Romania (Eutardigrada: Milnesiidae, Macrobiotidae), with some remarks on secondary sex characters in *Milnesium dornensis* sp. nov.

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Abstract

In two moss and lichen samples collected in Romania, two new eutardigrade species were found. *Milnesium dornensis* sp. nov. belongs to the *granulatum* group and differs from most of other species in this group mainly by having a different claw configuration ([3-3]-[3-3]) and by some morphometric characters. *Minibiotus diversus* sp. nov. is very similar to *M. gumersindoi* Guil & Guidetti, 2005 and *M. weglarskae* Michalczyk *et al.*, 2005, but differs from these and other congeners by the cuticular pore arrangement and morphometric characters of both adults and eggs. Males and females of the newly described *Milnesium* species differ not only by the shape and structure of claws I, but also by other morphometric characters. Males of *Milnesium dornensis* sp. nov. are smaller, more slender, have shorter papillae and relatively longer claws on legs III–IV.

Key words: Europe, females, males, *Minibiotus diversus* sp. nov., new species, Tardigrada, taxonomy.

Introduction

The geographical location of Romania places it within the Palearctic ecozone (Holt *et al.* 2013). In eastern regions of the country the climate has more continental character (hot and dry), while in the northern parts Scandinavian–Baltic effects dominate, which cause a higher quantity of rain and lower temperatures. Also, the topography of Romania is very diverse with higher mountains (up to 2,500 asl) in the central part of the country and high humidity throughout the year (Romania's National Administration of Meteorology http://www.meteoromania.ro/anm/?page_id=114).

Although in Romania more than 150 tardigrade taxa have been reported over time (but only 128 valid in modern taxonomy), most of them were recorded before 1964 and only eight have been reported recently (Kaczmarek & Michalczyk 2008, Ciobanu *et al.* 2014a–c). Since tardigrade taxonomy has changed dramatically during this time, the presence of some tardigrade species previously reported from this region needs confirmation (e.g. *Isohypsibius arcuatus* (Bartoš, 1934), *Macrobiotus furciger* Murray, 1907 or *Pseudechiniscus conifer* (Richters, 1904). For more details see Ciobanu *et al.* (2014b).

The genera *Milnesium* Doyère, 1840 and *Minibiotus* R.O. Schuster, 1980 were reported from Romania relatively early (Botezat 1903, Rodewald 1936), but these records should be reconsidered according to modern taxonomy (see **Discussion** section).

The genus *Milnesium* was considered as monotypic with the single species *Milnesium tardigradum* until 1990 when Binda and Pilato described *Milnesium brachyungue*. Soon after that, more *Milnesium* species were described

Conclusion

In this paper we report two new tardigrade species for the Romanian checklist: *Milnesium dornensis* **sp. nov.** and *Minibiotus diversus* **sp. nov.** Including the new species described in this contribution, the total number of valid tardigrade taxa recorded from Romania is now 130.

We also report for the first time a full set of secondary sex characters in the new *Milnesium* species which differentiates males and females. These differences may play an important role not only during the reproduction process, but may also have an influence on feeding behaviour.

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