



<http://dx.doi.org/10.11646/zootaxa.3964.2.3>

<http://zoobank.org/urn:lsid:zoobank.org:pub:63400B31-A395-4670-AAA2-8C7CEBD9D464>

## A new species and ten new records of bdelloid rotifers from Korea

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### Abstract

We conducted a taxonomic study of bdelloid rotifers collected from various terrestrial habitats, such as mosses, lichens, mushrooms on tree trunks, and leaf litter, at six different locations in Korea. The study yielded 10 new Korean records and a new species, *Bradyscela hoonsooi* n. sp. Among the 10 new Korean records, nine species are new to Asia, and seven of these are rare species with poorly known distributions. Our study is the first to record *Habrotrocha fuscochlaena* De Koning outside its type locality. *Macrotrachela sonorensis* Örstan and *Habrotrocha acornis* Murray have previously been reported from only two countries. *Habrotrocha longula* Bryce and *Habrotrocha visa* Donner are recorded outside Europe for the first time. *Habrotrocha flaviformis* De Koning has previously been reported from Europe, Brazil and New Zealand. Finally, *Philodina grandis* Milne has been reported from Eastern and Southern Africa and New Zealand before the present study. Here, we provide a description of the new species and discuss the taxonomy and distribution of the seven rare species.

**Key words:** Rotifera, Bdelloidea, taxonomy, biogeography, Korea

### Introduction

The identification of bdelloids is based primarily on external characters such as rotatory apparatus shape, and the shape of trunk, foot and their appendages, as well as on details of internal morphology—mastax and other parts of digestive system (Donner 1965; Song 2014). In particular, the conformations of the corona, sulcus, upper lip, and disc retractor tend to be species-specific, and are important diagnostic characters (Donner 1965; Song 1999). Since these characteristics can be observed only in the creeping or feeding state, bdelloids must be identified in the active state when the soft organs, i.e. rotatory apparatus and foot, are completely stretched and opened, and it's basically impossible to identify bdelloids preserved without narcotization. This constitutes a challenge in bdelloid taxonomy and may explain the poor records of bdelloids from Korea, and also throughout the world (Ricci & Melone 2000; Song 2014).

The extraordinary tolerance to environmental extremes, such as anhydrobiosis, makes bdelloids probably the most widely dispersed group of rotifers (Koste & Shiel 1986). Bdelloids are found in sediments, among plant debris, or crawling on the surfaces of aquatic plants. Some forms inhabit capillary water films in soils, or in damp mosses and lichens (Devetter 2007; Donner 1965; Fontaneto & Melone 2003; Nogrady *et al.* 1993). According to Donner (1965), 95% of soil rotifers are bdelloids. Soil rotifers are present in practically all types of soil (Devetter 2007; Donner 1972). The structural features of bdelloids, such as, their elongated wormlike body, well-developed muscle system supporting leech-like movement or creeping, and flexible integument, represent morphological, physiological, and ecological adaptations specific for the soil microfauna and land biocenoses (Kutikova 2003).

In the present study, we conducted a taxonomic investigation of bdelloid rotifers collected from various terrestrial habitats, such as soil, mosses, mushrooms growing on tree trunks, and leaf litter, at six different locations in Korea. The study yielded 10 new Korean records and a new species, *Bradyscela hoonsooi* n. sp. In addition, we discuss the Korean new records, including the discussions on the taxonomy and distribution of the seven rare species. Finally, we briefly review the current studies on Asian bdelloids.