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## Unexpected occurrence of *Hemifridericia bivesiculata* Christensen & Dózsa-Farkas, 2006 in Hungary, a species presumed to be endemic to Devon Island, Canada, and its comparative analysis with *H. parva* Nielsen & Christensen, 1959 (Enchytraeidae, Oligochaeta)

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### Abstract

During the exploration of the enchytraeid fauna in forests and grasslands of Hungarian flat areas, a small enchytraeid species, *Hemifridericia bivesiculata* Christensen & Dózsa-Farkas, 2006, was found unexpectedly. This species was known previously only from one single location, Bank Island in the Canadian archipelago, and was presumed to be endemic. Here, the distinctive features of the two *Hemifridericia* species are described based on detailed morphological analyses, which were supported with molecular methods. The results demonstrated that the two *Hemifridericia* species are very similar morphologically, but can be clearly distinguished from each other by the presence or absence of the oesophageal vesicles and the shape of the brain. Some additional differences were observed between the Hungarian material and the type specimens of *H. bivesiculata*. The two species were unequivocally separated based on the studied molecular markers, the mitochondrial cytochrome *c* oxidase subunit I (CO1) gene, the nuclear histon 3 (H3) gene and the nuclear ribosomal ITS region.

**Key words:** Clitellata, molecular taxonomy

### Introduction

An extensive exploration of the enchytraeid fauna in the forests and grasslands of Hungarian flat areas was started in 2009. During these studies, an enchytraeid species of rather small size, *Hemifridericia bivesiculata* Christensen & Dózsa-Farkas, 2006, was found unexpectedly. Occurrence of this species was surprising, since it had been described previously only from one single location, Bank Island in the Canadian archipelago, and was presumed to be endemic (Christensen & Dózsa-Farkas 2006). Recently, *H. bivesiculata* has been recorded from Minnesota, U.S.A. (Schlaghamerský et al. 2013). The genus *Hemifridericia* currently contains three species: *H. bivesiculata*, *H. parva* Nielsen & Christensen, 1959, which has a more extended distribution in the Holarctic (Schmelz & Collado 2010) and also records from Hungary (Dózsa-Farkas 2007), and *H. varanensis* Lal, Singh & Prasad, 1981. However, this latter differs from the other two species in an important character (spermatheca free, not attached to the oesophagus), therefore its affiliation to the *Hemifridericia* genus is questionable and in need of revision, which is beyond the scope of this study. The former two species are very similar; *H. bivesiculata* is distinguished by a double blister-like oesophageal vesicle (origin of species epithet, 'bivesiculata'), which is missing in *H. parva*. Here we describe the distinctive features of the two *Hemifridericia* species based on detailed morphological and morphometric analyses, and we support their separation with molecular methods.

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