

# Extension of employing ITS region in the investigation of Hungarian *Fridericia* species

(Oligochaeta: Enchytraeidae)

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**Abstract.** Same species of genus *Fridericia* (Oligochaeta: Enchytraeidae) collected from different localities, can have small differences in their morphology, for example, the number of nephridia or length and width of the spermathecal ectal duct. During the identification of enchytraeid worms, several characteristics were investigated at the same time but presence of small variations in only one or two main characteristics can cause taxonomic difficulties or may raise the possibility of encountering a subspecies. Using molecular biological techniques can help answer these questions. In preceding researches of the authors ITS (Internal Transcribed Spacer) came into focus. ITS is mainly a non-coding region of ribosomal DNA located between the 18S and 28S rDNA genes. Based on these previous studies, in the present analysis, the authors extended their investigation to include examination of the morphology and genes of various *Fridericia* species from different parts of Hungary. Phylogenetic trees were also created by Maximum Parsimony (MP), Neighbor-Joining (NJ), and Bayesian analyses. In the present study, we established that molecular biological techniques are suitable to confirm that individuals from the same species (but collected from different places) have the same genetic profile, while very similar species can be shown to clearly segregate on the phylogenetic tree based on the divergence of certain external or internal characteristics. Even though partial sequences give us only rough information about the phylogenetic position of the species, our aim is to show how the ITS region is suitable to investigate closely related enchytraeid worms and to differentiate the morphologically similar species.

**Key words.** ITS, *Fridericia*, Enchytraeidae, phylogeny.

## Introduction

It is well documented that the same species of genus *Fridericia* (Oligochaeta: Enchytraeidae), collected from different localities, can have small differences in their morphology, for example, in the number of nephridia in *Fridericia maculatiformis* Dózsa-Farkas, 1972. Individuals of this species have four pairs of nephridia at Sashegy Nature Conservation Area, Hungary, but five pairs occur in the population of Szent György-hegy Reserved Area, Hungary (unpublished observation by BOROS & DÓZSA-FARKAS).

Another example is *Fridericia cf. aurita* Issel, 1905, which was examined in earlier studies on the basis of morphology and compared with the results of DNA sequencing (presented at the 3<sup>rd</sup> International Oligochaete Taxonomy Meeting, Platres, Cyprus, unpublished observation by BOROS & DÓZSA-FARKAS). Here, the length and width of the spermathecal ectal duct varies between relatively wide ranges. However, during the identification of enchytraeid worms, when several characteristics are investigated simultaneously, sometimes