



## An exploration of *Echinoderes* (Kinorhyncha: Cyclorhagida) in Korean and neighboring waters, with the description of four new species and a redescription of *E. tchefouensis* Lou, 1934\*

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### Abstract

A large collection of kinorhynch specimens from coastal and subtidal localities around the Korean Peninsula and in the East China Sea was examined, and the material included several species of undescribed or poorly known species of *Echinoderes* Claparède, 1863. The present paper is part of a series dealing with echinoderid species from this material, and includes descriptions of four new species of *Echinoderes*, *E. aspinosus* **sp. nov.**, *E. cernunnos* **sp. nov.**, *E. microaperturus* **sp. nov.** and *E. obtuspinosus* **sp. nov.**, and redescription of the poorly known *Echinoderes tchefouensis* Lou, 1934.

**Key words:** East Sea, East China Sea, kinorhynch, Korea, meiofauna, taxonomy

### Introduction

*Echinoderes* Claparède, 1863 appears to be the most diverse genus within the Kinorhyncha. Species of this genus have been found in most marine benthic substrates, on latitudes ranging from the Arctic to the tropics, and from the intertidal zone down to the deep sea. Still, our information about their global distribution is extremely fragmented, as is our knowledge about their total biodiversity. As it is the case with most other minor meiofaunal taxa, our current knowledge about their geographical distribution is to a great extent a reflection of the activities of the few experts that have addressed the group through time. For the genus *Echinoderes* and its closest relatives, we can consider the east American coast, from Maine to Belize, relatively well-examined thanks to a lifelong effort of Robert P. Higgins (see, e.g., Higgins 1964, 1977, 1983). Also the Mediterranean and West European coasts are relatively well-explored through the pioneering work of Zelinka (1928), as well as more recent efforts of Higgins (1978, 1985), Huys & Coomans (1989), Pardos *et al.* (1998), G<sup>a</sup>Ordóñez *et al.* (2008), and Herranz *et al.* (2012).

The best explored region in East Asia is probably the area between Southeast Russia, the Korean Peninsula and Japan. *Echinoderes* around Korea, and in neighboring Russian and Japanese waters, have first of all been addressed in several studies facilitated by A. V. Adrianov. He has described two species from Korean waters, *E. koreanus* Adrianov, 1999 in Adrianov & Malakhov (1999) and *E. ulsanensis* Adrianov, 1999 in Adrianov & Malakhov (1999), and additional four from nearby Japanese or Russian localities that very well could occur around the Korean Peninsula as well: *Echinoderes multisetosus* Adrianov, 1989, *E. filispinosus* Adrianov, 1989, *E. aureus* Adrianov, Murakami & Shirayama, 2002a, *E. sensibilis* Adrianov, Murakami & Shirayama, 2002b. Besides the contributions of Adrianov and collaborators, other studies have also added to our knowledge about kinorhynch biodiversity in the region. *Echinoderes tchefouensis* Lou, 1934 was described from nearby Chinese waters (see also