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A New Brackish-water Species of *Echinoderes* (Kinorhyncha: Cyclorhagida) from the Seto Inland Sea, Japan

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Echinoderes ohtsukai sp. nov. is described from an intertidal flat in the Seto Inland Sea, Japan, based on observations with light and scanning electron microscopy. *Echinoderes ohtsukai* is characterized by 1) a short middorsal spine on segment 4; 2) lateroventral tubules on segments 5 and 8; 3) short laterodorsal tubules on segment 10; 4) a trunk 315–395 μm long; 5) a lack of lateral terminal accessory spines in both sexes; and 6) lateral terminal spines of about 50% trunk length. The species has modified type-II glandular cell outlets, which have previously been reported among congeners only in *E. rex* Lundbye, Rho and Sørensen, 2011 from the Korea Strait.

Key Words: Kinorhyncha, Echinoderidae, meiofauna, taxonomy.

Introduction

Echinoderes Claparède, 1863, the most species-rich genus among those comprising the phylum Kinorhyncha, includes 69 valid species and has a worldwide distribution, ranging vertically from the intertidal to the abyssal zone, with the deepest record being from 5649 m (Sørensen and Pardos 2008). *Echinoderes* is characterized morphologically by having 1) 16 placids in the neck region, 2) segments 1 and 2 in the trunk region each consisting of a complete cuticular ring, 3) segments 3–11 in the trunk region comprising one tergal and two sternal plates, and 4) no midterminal spine in adults. Species of *Echinoderes* have traditionally been identified by the presence and distribution of spines and tubules. Although information on minute cuticular structures such as sensory spots, glandular cell outlets, and sieve plates observed by scanning electron microscopy (SEM) are now also important taxonomic characters, these structures have not always been consistently reported, and such data are not available for over half the species of this genus known today.

To date, there have been nine reports of kinorhynchs from Japan. The first was *Echinoderes masudai* Abe, 1930 (*q.v.*) from Gogoshima Island, but it is a *nomen dubium* because of the poor original description (Adrianov and Malakhov 1999). Tokioka (1949) reported *E. dujardini* Claparède, 1863 from Ago Bay, although this occurrence was far outside the range of the species in European waters, and thus this identification has been questioned (Higgins 1983). *Kinorhynchus yushini* Adrianov, 1989 was reported by Sudzuki (1976) as *Trachydemus* sp. and later confirmed by Adrianov and Malakov (1999). The fourth was described as a new genus and species, *Dracoderes abei* Higgins and Shirayama, 1990 (*q.v.*) from Mukaisihima Island. Subsequently, four species (*E. aureus* Adrianov *et al.*, 2002c; *E. sensibilis* Adrianov *et al.*, 2002b; *Condyloderes setoensis* Adrianov *et al.*, 2002a; and *Pycnophyes tubuliferus* Adrianov, 1989) were described from Tanabe Bay (Adrianov *et al.* 2002a, b, c; Murakami *et al.* 2002). Sørensen *et al.* (2011) reported *D. abei*, *K. yushini*, and *P. tubuliferus* from five additional localities in the Seto Inland Sea.

In a faunal survey of an intertidal flat in the Seto Inland Sea, we collected specimens of species of *Echinoderes*. Here we describe this species as new, based on light and electron microscopic observations of minute cuticular structures.

Material and Methods

Sediment samples were taken from an intertidal flat near the Takehara Marine Science Station (Hiroshima University) in the Seto Inland Sea, Japan (Fig. 1A–C). The sampling area was close to the mouth of Kamogawa River (Fig. 1C, D), and the area is affected by freshwater outflow (although the salinity at the time of collecting was not recorded, see Discussion). Sediment in the area comprised mud and sand with rich detritus, and was well-oxygenated without a sulfurous smell. Thirty-two specimens were extracted from the samples by the bubbling method (Higgins 1988) and preserved in 99% ethanol. Of these, six were prepared for light microscopy, five were for SEM, 13 were kept as HY's personal collection for future molecular analysis; three were lost during preparation for SEM. For light microscopy, specimens were transferred into a solution of 95% ethanol and 5% glycerol; after evaporation of the ethanol, specimens were mounted individually in Hoyer's-125 mounting medium between two cover slips, positioned on an H-S slide (Higgins 1988), and examined with a Nomarski interference microscope. For SEM, specimens were cleaned in a 1% sodium hypochlorite solution in deionized water (DW), rinsed in DW, dehydrated in an ethanol series, dried in a CO_2 critical-point drier (Hitachi HCP-2), mounted on