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Two new Japanese species of Gastrotricha (Chaetonotida, Chaetonotidae, *Lepidodermella* and Dichaeturidae, *Dichaetura*), with Comments on the Diversity of Gastrotrichs in Rice Paddies

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Abstract

Two new species of freshwater gastrotrichs are described from rice paddies in Otsu, Shiga, Japan. *Lepidodermella acantholepida* n. sp. is a medium sized species attaining a length of 145 µm, scales are flattened ovals and similar to those of *L. squamata* except that two dorsal scales near the furca have a claw-like spine. *Dichaetura filispina* n. sp. is a medium sized species attaining a length of 185 µm, characterized by a thin, fiber-like spine, a spined furca with a constriction near its base and an elongate body. A total of 44 species (seven genera) including two new species were found in the rice paddies. The diversity of rice paddy gastrotrichs is briefly discussed.

Key words: *Dichaetura*, benthos, *Lepidodermella*, freshwater gastrotrichs, rice paddy, rice paddy fauna

Introduction

Gastrotricha is a small phylum composed of 765 marine and freshwater species that live in the interstitial spaces of bottom sediments and superficial detritus, the surfaces of submerged plants and animals, and the water film of soil particles (Balsamo *et al.* 2009; Hummon & Todaro 2010; Todaro & Tongiorgi 2013). There are two major groups: the marine (except for 2 species) Macrotrichida; and the marine and freshwater Chaetonotida, which are common in all bodies of fresh water. Their body has a tenpin-, bottle-like or cylindrical shape and is flattened ventrally and arched dorsally. There is an anterior head with sensory organs, a brain, and a pharynx. Most Chaetonotida species have a posterior furca which bears an adhesive organ. The macrotrichids and some chaetonotids have adhesive organs and their body resembles a cactus. The locomotory cilia are restricted to the ventral surface, and in chaetonotids form a pair of ciliary bands. The body wall is usually composed of an external cuticle of flexible proteinaceous layers, an external lamellar layer and a basal granula layer. Most gastrotrichs have cuticular scales, spines, and hooks under the cuticle layers (Ruppert 1991). The cuticular scales vary in arrangement and shape, depending on the species. Freshwater gastrotrichs are commonly found in ponds, swamp, streams, and lakes.

Paddies are a typical feature of rice (*Oryza sativa*) culture in eastern and southern Asia, providing a habitat for a wide variety of aquatic organisms despite the heavy interference by rice farmers. In Japan, 34 gastrotrich species have been reported from lakes, ponds, and swamps (Suzuki & Furuya 2011), but few from rice paddies. Only a small number of gastrotrichs were reported from rice paddies after midseason drainage (Yamazaki *et al.* 2003; Yamazaki *et al.* 2004). In a previous study (Yamazaki *et al.* 2003; Yamazaki *et al.* 2004), specimens were observed in the mud or water collected from areas surrounding rice plants in the main part of the paddy. Gastrotrichs do not favor such open areas without shade, so in the present study specimens were collected from mud near paths at rice paddy edges. These paths are associated with various kinds of weeds, the leaves of which extend over, or even touch, the water. The shaded areas provided by these leaves were considered to be likely preferred habitats for gastrotrichs, and indeed in the present study a large number were found living in this environment, and a high diversity was found also upon inspecting paddies before midseason drainage.