Zootaxa 1750: 19–31 (2008)
www.mapress.com/zootaxa/

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Diversity of cryptic Metazoa in Australian freshwaters: a new genus and two new species of sessile rotifer (Rotifera, Monogononta, Gnesiotrocha, Flosculariidae)

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Abstract

Rotifers are obligate aquatic animals that are reputed to have particularly efficient mechanisms to survive extreme, or prolonged periods of drought, in the form of inconspicuously small resting stages, hidden between plant litter and sediment. In order to study this phenomenon, we conducted a hatching experiment on dry sediment from two billabongs in Victoria, Australia, which had been stored under dehydrated conditions for about one year. Here, we report on the diversity of rotifers that hatched during the experiment. A total of 48 species, a majority of which belong to groups of sessile rotifers, were recorded, including several new or interesting taxa. Two new taxa are described: *Floscularia wallacei* **n. spec.**, and *Pentatrocha gigantea* **n. gen.**, **n. spec**., the largest rotifer ever recorded. *Ptygura ctenoida* Koste & Tobias, 1990 is raised to species rank.

Key words: hatching experiment, dry sediment, resting stages

Introduction

Rotifers, of which there are about 2030 species (Segers 2007), are minute metazoans having resistant resting stages (encysted embryos) as propagules and as means of surviving adverse conditions, and are capable of parthenogenetic reproduction. Their biogeography has long been considered an unexciting field. They were long thought to be exemplary for the cosmopolitan distribution microscopic organisms are assumed to exhibit. This view was already proposed in the early days of rotifer research (e.g., Jennings 1900; Rousselet 1909) and has recently invigorated intense debate (e.g., Fenchel & Finlay 2004 versus Foissner 2006). Although cosmopolitanism may be important in rotifers, numerous examples of taxa having restricted distributions or exhibiting complex distribution patterns are known. Of relatively recent literature, Green (1972) was the first to point at the endemicity in some South American rotifers, and to latitudinal patterns in the distribution of rotifers. Later, reports on distribution patterns included Brachionidae (Pejler 1977; Dumont 1983), Lecanidae (Segers 1996), Trichocercidae (Segers 2003) and diverse taxa (De Ridder 1981; Segers 2008; Segers & De Smet 2008). One possible hypothesis explaining the discrepancy between the expected cosmopolitanism and the observed patterns is that non-cosmopolitan rotifers have less effective resting stages (e.g., see Chittapun *et al.* 2005) or that they produce these only rarely (Bailey *et al.* 2003; Segers 2008; Segers & De Smet 2008).

We tried to test this hypothesis, by examining the Rotifera hatching from sediments of two billabongs of the River Murray floodplain near Wodonga, Victoria, Australia. This habitat, which belongs to the geologically old Murray-Darling Basin (Shiel, 1994) is known to be inhabited by a number of endemic, ploimid rotifers (Shiel 1981; Shiel & Koste 1983; Langley *et al.* 2001). If resting eggs of endemic rotifers would be rare

Accepted by R. Dalgleish: 12 March 2008; published: 16 Apr. 2008