

# First Japanese Record of *Heteropriapulus heterotylus* (Monogenea: Dactylogyridae), from the Alien Catfish *Pterygoplichthys disjunctivus* (Siluriformes: Loricariidae) in Okinawa

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The dactylogyrid monogenean *Heteropriapulus heterotylus* (Jogunoori, Kritsky and Venkatanarasaiah, 2004), most likely of neotropical origin, is reported from the gills of a new host, *Pterygoplichthys disjunctivus* (Weber, 1991), an armored catfish native to South America, collected in a reservoir on Okinawa Island, southern Japan. Illustrations and measurements are provided. This collection represents a new country and a new host record for the parasite.

**Key Words:** *Heteropriapulus heterotylus*, Monogenea, fish parasite, *Pterygoplichthys disjunctivus*, new record, introduced species, Okinawa, Japan, freshwater.

## Introduction

Armored catfishes of the family Loricariidae (Actinopterygii: Siluriformes) are popular in Japan as ornamental aquarium fish and are imported into this country through the tropical fish trade (Matsuzawa and Senou 2004). The vermiculated sailfin catfish *Pterygoplichthys disjunctivus* (Weber, 1991), of South American origin, is one such armored catfish and, since the 1980s, it has become established in rivers on Okinawa Island, southern Japan (Takeshima and Yoshino 1996; Tachihara *et al.* 2002). It has also become established in several states of the U.S.A. (Texas, Florida, and Nevada), Taiwan, the Philippines, Indonesia, Singapore, and Turkey (Hoover *et al.* 2004; Chavez *et al.* 2006; Page and Robins 2006; Özdilek 2007; Gibbs *et al.* 2008).

Four species of monogenean are known to have been introduced with armored catfishes into India and China (Jogunoori *et al.* 2004; Li *et al.* 2009; Li and Huang 2012). This paper reports on the dactylogyrid monogenean *Heteropriapulus heterotylus* (Jogunoori, Kritsky and Venkatanarasaiah, 2004) parasitic on the gills of *P. disjunctivus* from Okinawa Island, southern Japan, as a new country and a new host record for this parasite.

## Materials and Methods

Three specimens of *Pterygoplichthys disjunctivus* were collected on 20 September 2012 using a hand net or a cast net in the Senbaru Reservoir (26°15'02"N, 127°45'56"E) in

the drainage area of the Makiminato River on Okinawa Island, within the campus of the University of the Ryukyus in Senbaru, Nishihara, Okinawa Prefecture, Japan. The fish were brought alive to the laboratory, where they were sacrificed, and their gills removed and examined under a dissecting microscope. Eleven monogeneans were found on the gills of one of the fish. The worms were collected from the gills using small needles and fixed in ammonium picrate glycerin under coverslip pressure (Lim 1991). These specimens were observed for whole-body morphology, then dehydrated through a graded ethanol series, cleared in xylene, and mounted in Canada balsam. Drawings were made with the aid of a drawing tube fitted on an Olympus BX51 light microscope. Hook measurements are presented in Fig. 1. Measurements, in micrometers, are expressed as the mean  $\pm$  standard deviation followed in parentheses by the range and the number (n) of specimens examined. Morphological terminology follows Jogunoori *et al.* (2004). The fish were identified based on Hosoya (2002), and the scientific and common names of fishes used in this paper follow Froese and Pauly (2013). Prevalence and intensity of infection are as defined by Bush *et al.* (1997). All specimens are deposited in the Platyhelminthes collection of the National Museum of Nature and Science, Tsukuba, Japan (NSMT-Pl 6030).

*Heteropriapulus heterotylus* (Jogunoori, Kritsky and Venkatanarasaiah, 2004)  
(Fig. 2)

*Heterotylus heterotylus* Jogunoori, Kritsky and Venkatanarasaiah, 2004: 116–117, figs 1–7.  
*Heteropriapulus heterotylus*: Kritsky, 2007: 233; Li and