



## Faunal survey and identification key for the trematodes (Platyhelminthes: Digenea) infecting *Potamopyrgus antipodarum* (Gastropoda: Hydrobiidae) as first intermediate host

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### Abstract

A diverse guild of digenean trematodes infects the New Zealand mud snail, *Potamopyrgus antipodarum*, as first intermediate host. This manuscript offers an initial systematic treatment of these trematodes and relies on published and new information. I list 20 trematode species, for which I provide taxonomic affinities, life-cycle information, and an identification key. A species account section presents photographs, diagnostic information, additional descriptive notes, and information on relevant research concerning the listed species. The major aim of this manuscript is to facilitate research on this trematode guild by providing information and identification tools, and by highlighting gaps in our knowledge.

**Key words:** Parasites, parasitic castrators, New Zealand, streams, biodiversity

### Introduction

How many trematode species infect, as first intermediate host, the New Zealand mud snail, *Potamopyrgus antipodarum* (Gray)? To what families do these parasitic castrators belong? What types of hosts might they infect at other parts of their life cycles? What other information is known about these species? How can one go about identifying them? This manuscript aims to address these questions, and serve as a tool to permit at least a provisional answer to the last.

*Potamopyrgus antipodarum* serves as first intermediate host for a speciose guild of trematode parasitic castrators (Jokela & Lively 1995; McArthur & Featherston 1976; Winterbourn 1974). The snail and these parasites have been the subject of numerous biological, ecological, and evolutionary studies (references below). This includes classic empirical work concerning host-parasite coevolution and local adaptation of parasites for their hosts (e.g., Lively 1987). This freshwater snail is also of interest because it is introduced in several areas throughout the world (Ponder 1988), including southeastern Australia, Japan, North America, and Europe. Introduced populations lack or are rarely parasitized by trematode castrators (Gerard & Le Lannic 2003; Zbikowski & Zbikowska 2009), outside of Australia (e.g., see Schreiber *et al.* 1998).

There have been no systematic treatments of this trematode guild. Winterbourn (1974) provided an initial, extensive depiction of the trematodes that he encountered during his thorough investigations of the systematics and biology of *P. antipodarum* throughout New Zealand. He listed 14 species. MacFarlane (1939;1945;1951) had previously described the life cycles of three of Winterbourn's 14. Winterbourn provided descriptive information for the 11 unreported species. He classified the trematodes into basic, non-taxonomic, morphological cercaria-type categories. Bisset (1978) described two species, but did not relate them to Winterbourn's list. Other surveys have generally followed Winterbourn's listing (e.g., Jokela & Lively 1995), or otherwise categorized the trematodes into non-taxonomic, cercarial morphological categories (e.g., McArthur & Featherston 1976). Hence, most of most of the constituent species in the guild of trematodes infecting *P. antipodarum* have not been adequately described, or placed within taxa to the extent possible.

This manuscript treats the trematodes known to infect *P. antipodarum* as first intermediate host. It relies