



## Two new *Stephanostomum*-like cercariae (Digenea: Acanthocolpidae) from *Nassarius dorsatus* and *N. olivaceus* (Gastropoda: Nassariidae) in Central Queensland, Australia

LEONIE J. BARNETT<sup>1</sup>, TERRENCE L. MILLER<sup>2</sup> & THOMAS H. CRIBB<sup>3</sup>

<sup>1</sup>Centre for Environmental Management, CQUniversity Australia, Bruce Highway, North Rockhampton, Queensland 4702, Australia.  
E-mail: l.barnett@cqu.edu.au

<sup>2</sup>Biodiversity Program, Queensland Museum, PO Box 3300, South Brisbane, Queensland 4101, Australia.  
E-mail: terrence.miller@qm.qld.gov.au

<sup>3</sup>Centre for Marine Studies and Department of Microbiology and Parasitology, The University of Queensland, Brisbane, Queensland 4072, Australia. E-mail: t.cribb@uq.edu.au

### Abstract

Two new *Stephanostomum*-like cercariae, *Cercaria capricornia* VII and *Cercaria capricornia* VIII (Digenea: Acanthocolpidae), are described from the nassariid gastropods *Nassarius dorsatus* and *Nassarius olivaceus* collected from the intertidal zone in the Capricornia region of Central Queensland, Australia. Morphological analysis of these new cercariae was augmented with DNA sequence data from the large subunit (LSU) ribosomal DNA region to aid in identification. Bayesian inference analysis of the LSU rDNA revealed that these putative acanthocolpid cercariae nested well within a clade containing species of *Stephanostomum*, which along with morphological data, suggests they are species of *Stephanostomum*. Comparative analysis of LSU rDNA sequences also indicates that these two cercariae are not *S. adlardi*, *S. bicoronatum*, *S. tantabiddii* or *S. cf. uku*, all species known from Australian fishes. The secondary structure of the internal transcribed spacer 2 (ITS2) rDNA region was inferred for these two cercariae using minimum free energy modelling algorithms. Both cercarial types displayed a four helix ITS2 secondary structure model and differed from each other by two compensatory base changes (CBCs) and nine hemi-CBCs.

**Key words:** *Cercaria capricornia*; Capricornia; *Nassarius dorsatus*; *Nassarius olivaceus*; LSU rDNA; large subunit ribosomal DNA; CBC; compensatory base change; ITS2; internal transcribed spacer 2

### Introduction

The Acanthocolpidae Lühe, 1906 is a large family of digenean trematodes that infects the gastrointestinal tract of marine fishes. Asexual reproduction occurs in a range of gastropods and metacercariae infect the tissues of fishes which are then eaten by piscivores to complete the life cycle. Although 17 genera were recognised in the family by Bray (2005), *Stephanostomum* Looss, 1899, with over one hundred species, is by far the largest in the family and one of the largest in marine fishes (Cribb *et al.* 2002). Despite the size of the genus, the life cycles and cercarial stages have been characterised for only five species (Madhavi & Shameem 1993). A single further *Stephanostomum*-like cercariae, *Cercaria bengalensis* VII Gnana Mani, 1994, has been described (Gnana Mani 1994). For such a large and important genus, the range of hosts infected and the morphological consistency of the intra-molluscan stages is of considerable interest.

The nassariid gastropods *Nassarius dorsatus* (Röding) and *Nassarius olivaceus* (Bruguère) are common scavengers in the intertidal mangroves of the Capricornia region in Central Queensland, Australia. There are ten probable acanthocolpid cercariae reported previously from nassariid gastropods. There are three species of *Stephanostomum*: those of *Stephanostomum tenue* (Linton, 1898) Linton, 1934 and *Stephanostomum dentatum* (Linton, 1900) Linton, 1940 (syn. *Cercaria dipteroerca* Miller and Northup, 1926) from *Nassarius obsoletus* Say (see Martin 1939; Stunkard 1961) and *Stephanostomum cloacum* (Srivastava, 1938) Manter &