



A cryptic complex of species related to *Transversotrema licinum* Manter, 1970 from fishes of the Indo-West Pacific, including descriptions of ten new species of *Transversotrema* Witenberg, 1944 (Digenea: Transversotrematidae)

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Abstract

Transversotrema licinum Manter, 1970 was described from two species of fishes from Moreton Bay, Queensland, and subsequently reported from 13 further species from six families in the Indo–West Pacific region. This study records specimens morphologically similar to *T. licinum* from 48 fish species from 11 families. A combined analysis of the second internal transcribed spacer region (ITS2) of ribosomal DNA and morphological data revealed a complex of at least 15 species and from these data ten new species of *Transversotrema* Witenberg, 1944 are described here. *T. licinum sensu stricto* is characterised in terms of morphology, distinct genotype, wide host distribution (Kyphosidae, Lutjanidae, Monodactylidae, Mugilidae, Pomacentridae and Sparidae) and, at present, is known only in Moreton Bay. The following new species are proposed: *T. atkinsoni* n. sp. from nemipterids from Heron Island (southern GBR) and Ningaloo Reef (Western Australia); *T. borboleta* n. sp. from chaetodontids and lutjanines (Lutjanidae) from Lizard Island and Heron Island; *T. cardinalis* n. sp. from lutjanines and a haemulid from Lizard Island; *T. carmenae* n. sp. from nemipterids from Lizard Island; *T. dam-sella* n. sp. from pomacentrids, a labrid and a mugilid from Lizard Island; *T. espanola* n. sp. from lutjanines from Heron and Lizard Islands; *T. fusilieri* n. sp. from caesionines (Lutjanidae) from Lizard Island; *T. manteri* n. sp. from caesionines from Lizard Island and Ningaloo Reef; *T. nova* n. sp. from a nemipterid from New Caledonia; and *T. witenbergi* n. sp. from caesionines from Heron Island. *Transversotrema borboleta* n. sp. is itself probably a complex of at least three closely related species but these are not yet sufficiently well delineated to allow separate descriptions. Four putative species referred to as Species A–D recognised from molecular analysis have not been described because of insufficient data. Most species are evidently strongly restricted to families or subfamilies of fishes. Only *T. licinum* appears to be genuinely euryxenic. *Transversotrema borboleta* infects chaetodontids and lutjanids but the nature of the distribution may be an indication that it represents a species complex. Most of the species appear to have restricted ranges, being absent from susceptible host species at some localities.

Key words: Digenea, Transversotrematidae, Chaetodontidae, Haemulidae, Kyphosidae, Labridae, Lutjanidae, Monodactylidae, Mugilidae, Nemipteridae, Pomacentridae, Sillaginidae, Sparidae, Great Barrier Reef, the Maldives, Moreton Bay, New Caledonia, Ningaloo Reef, Palau

Introduction

The Transversotrematidae Witenberg, 1944 is a morphologically distinctive family of digenean trematodes that presently has four genera and 11 species (Hunter & Cribb 2010; Hunter *et al.* 2010). The family is characterised by a two–host life cycle, and the cercarial form which, where known, has a body that resembles the adult and a tail that has unique arm–like processes at its base (Cribb 2002). Confirmed accounts place transversotrematids in marine waters of the Indo–Pacific region and in freshwater bodies on landmasses that border these oceans (Cribb *et al.* 1992). As is common for many groups of digeneans, species within this family are often difficult to distinguish morphologically and the adoption of molecular techniques in addition to detailed morphological examination has revealed a great diversity and richness (Hall & Cribb 2004; Hunter *et al.* 2010; Jousson & Bartoli 2001; Miller & Cribb 2007a, c; Nolan & Cribb 2005).

A recent study of the Transversotrematidae of the Indo–West Pacific, with emphasis on the Great Barrier Reef (GBR) (Hunter & Cribb 2010), found four genetically distinct lineages of marine transversotrematids: (1) *Crusziella formosa* Cribb, Bray & Barker, 1992; (2) (Group A) a complex of species resembling *Transversotrema haasi* Witenberg, 1944 reported on by Hunter *et al.* 2010 (3); (Group B) a complex of species associated with mul-lid fishes; and (4) (Group C) a complex of species related to and resembling *Transversotrema licinum* Manter, 1970. Here we consider the species level composition of the *T. licinum* group.

Transversotrema licinum Manter, 1970 was described from two species of marine fishes from Moreton Bay, Queensland, Australia. The type-host nominated by Manter (1970) was “*Scorpius* sp., Scorpaenidae”, however, a review of the Transversotrematidae (Cribb *et al.* 1992) questioned its status, as *Scorpius* is not a commonly used generic name for fish in Queensland nor is it a genus within the Scorpaenidae. It is possible that the fish was *Scor-pis lineolatus* Kner (Kyphosidae) which is known from the area. A single poor specimen of *Transversotrema* was recovered from this fish during the present study. The second host reported by Manter (1970), *Microcanthus strig-atuus* (Cuvier), also a kyphosid, and a well recognised species in the area, has also been found infected with trans-versotrematids in Moreton Bay as part of this study. *Transversotrema licinum* was subsequently recorded from 12 fish families variously from multiple sites around the Australian coast (Cribb 2002; Cribb *et al.* 1992; Cribb *et al.* 1994; Grutter 1994; Hayward 1997) and from Kuwait (Sey *et al.* 2003). This study was conducted to address a