



Morphological constraint obscures richness: a mitochondrial exploration of cryptic richness in *Transversotrema* (Trematoda: Transversotrematidae).

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Species of *Transversotrema* Witenberg, 1944 (Transversotrematidae) occupy a unique ecological niche for the Trematoda, living externally under the scales of their teleost hosts. Previous studies of the genus have been impeded partly by limited variation in ribosomal DNA sequence data between closely-related species and partly by a lack of morphometrically informative characters. We assess richness of the genus in the tropical Indo-west Pacific through parallel molecular and morphometric analyses, generating cytochrome c oxidase subunit 1 mitochondrial data sequence and morphometric data for hologenophore specimens from Australia, French Polynesia, Japan and Palau. These analyses demonstrate that molecular data provide the only reliable basis for species identification; host distribution, and to a lesser extent morphology, are useful for identifying just a few *Transversotrema* species. We infer that a combination of morphological simplicity and infection site constraint has led to the group displaying exceptionally low morphological diversification. Phylogenetic analyses of the mitochondrial data broadly support previous systematic interpretations based on ribosomal data, but also demonstrate the presence of several morphologically and ecologically cryptic species. There are now 26 *Transversotrema* species known from Australian marine fishes, making it the richest trematode genus for the fauna.

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