Molecular analysis of *Acanthobothrium* and its implications for geographic versus host associations as determinates of cestode phylogeny

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The cestode genus *Acanthobothrium* is by far the most ubiquitous genus of elasmobranch cestodes, parasitizing 10 of the 14 elasmobranch orders. Most species in this genus are remarkably host specific, exhibiting essentially oioxenous specificity for their definitive hosts. A common assumption in the parasite literature is that high host specificity will be maintained through evolutionary time resulting in parasite phylogenies that mirror the phylogenies of their hosts. The goal of this study was to determine if evolution of the highly specific *Acanthobothrium* species is mirroring evolution of their elasmobranch hosts. Broad geographic and host sampling of *Acanthobothrium* species was necessary to address this question. Molecular sequence data from the nuclear ribosomal subunit 28S were generated for 44 parasite species from 8 elasmobranch orders collected off the coasts of Africa, North America, Australia and Borneo. Bayesian inference and maximum parsimony were used to analyze the molecular dataset. In all analyses *Acanthobothrium* was found to form a single well-supported clade, which consisted of three well-supported subclades. Based on these molecular results, host associations do not appear to be determinates of phylogeny. *Acanthobothrium* species parasitizing an elasmobranch order were never each other's closest relatives. Instead, *Acanthobothrium* species of an order were distributed throughout the phylogeny. The molecular results supported geography as a good determinate of parasite phylogeny. Regardless of host associations, two of the three subclades showed strong geographic affinities, with one subclade of species being distributed throughout the Atlantic basin and Baja California and the second distributed in localities throughout the Indo-Pacific. These results suggest that evolution of this diverse and host specific genus is not being driven by host ordinal relationships. Host switching must have played a major role early on in the evolutionary history of *Acanthobothrium*.