

Attachment in challenging environments: Functional morphology of three distinct scolex morphotypes of *Acanthobothrium*
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Acanthobothrium is a species rich and globally distributed genus of host specific cestodes that parasitizes a diversity of elasmobranchs and whose phylogenetic relationships remain unknown. Several conspicuous morphological characters distinguish *Acanthobothrium* from other tetraphyllidean genera but the morphological diversity within the genus is also extensive. One of the most remarkable differences among species of *Acanthobothrium* is related to scolex shape; each species falls into one of three distinct categories referred to here as the robust, classic and cloverleaf morphotypes. This study attempts to understand the underlying structural differences among these scolex types. Whole mounts and histological sections were prepared according to conventional methods for multiple species of *Acanthobothrium*. The scolex proper of all species of each morphotype was found to have the same complex of muscle fibers. The bothridial muscles however, differed dramatically among scolex forms. The robust morphotype possessed thick bothridial muscles that were completely attached to the scolex proper on their proximal surface; the musculature was composed of densely interwoven fibers. The cloverleaf forms had long slender bothridia with 25-33% of the musculature attached to the scolex proper; the bothridial margins were reinforced with thicker musculature. The classic form had long slender bothridia but unlike the cloverleaf 60-70% of the musculature was attached to the scolex proper. Bothridial morphology appears to be intimately associated with mode of attachment. Species with the robust and classic scolex morphotypes were found with their scolices embedded deep in the host's intestinal musoca. The cloverleaf forms however, were found attached superficially to the intestinal surfaces, which may be facilitated by their flat sucker-like bothridia. At this time it remains unclear if the variation in scolex morphotypes is of phylogenetic or functional significance.