

Hanging out in shark guts: An investigation of tapeworm microtrix morphology
C.A. FYLER

Several tapeworm characters are commonly attributed to their specialized parasitic lifestyle including the secondary loss of the digestive system, the presence of attachment organs on the scolex, and a diversity of specialized extensions of the tegument called microtriches. Numerous studies examining the complex distribution and morphology of microtriches have revealed that the tapeworm tegument is often covered with a variety of forms of microtriches with distinct ultra-structure. Of particular interest in this study are the slender filitriches which appear to vary in length from very long to so short that they appear as short ball like structures in scanning electron micrographs. These short structures are commonly seen on the distal bothridial surface of multi-loculated tetraphyllidean tapeworms and have been tentatively classified as incredibly short filitriches but this morphological hypothesis has never been tested. Although studied less, it has also been shown that microtrix distribution can differ between the different life stages in a single tapeworm species, especially between the terminal larval stage (plerocercoid) and the adult. For this project, transmission electron microscopy (TEM) and scanning electron microscopy (SEM) were used to examine the scolex microtrix morphology of the plerocercoid and adult life stages of *Calliobothrium* cf. *verticillatum*, a multi-loculated tetraphyllidean tapeworm. Plerocercoids of *C. cf. verticillatum* were collected from the anterior midgut caeca of the flat-clawed hermit crab (*Pagurus pollicaris*) and adults of the same species were collected from the dusky smooth hound (*Mustelis canis*) from Long Island Sound. Microtrix distribution and morphology was investigated in three regions on the bothridia of the plerocercoid and adult scoleces: A proximal region which had long filitriches and large blade-like spinitriches in both plerocercoids and adults, a distal-proximal boundary which had blade-like spinitriches and filitriches that were always longer than those found anywhere else on the scolex in both plerocercoids and adults, and most remarkably, a distal bothridial region which changed dramatically in microtrix morphology from plerocercoid to adult. On the distal surface of the plerocercoids were long filitriches and blade like spinitriches whereas the adults had the small structures of the unusual morphology and very rare bladelike spinitriches. Several lines of evidence including comparisons with the microtriches seen on the larval surfaces, serial sectioning and cross section comparisons confirmed for the first time that these structures were short filitriches consistent with published data on microtrix morphology. These results are consistent with the tapeworm tegument being composed of two types of microtriches, spinitriches and filitriches. Filitriches can vary in size from extremely short, as seen here, to their more typical elongate form.