Angiostrongylus cantonensis: morphological and behavioral investigation within the freshwater snail Pomacea canaliculata

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An infection with Angiostrongylus cantonensis, the main causative agent for human eosinophilic encephalitis, can be acquired through the consumption of the freshwater snail Pomacea canaliculata. This snail also provides a suitable model to study the developmental morphology and behavior of A. cantonensis larvae, facilitated by the snail's distinct lung structure. We used microanatomy for studying the natural appearance and behavior of A. cantonensis larvae while developing within P. canaliculata. The distribution of refractile granules in the larval body and characteristic head structures changed during the developmental cycle. Two well-developed, rod-like structures with expanded knob-like tips at the anterior part were observed under the buccal cavity as early as the late second developmental stage. A 'T'-shaped structure at the anterior end and its tenacity distinguished the outer sheath from that shed during the second molting. Early first-stage larvae obtained from fresh rat feces are free moving and characterized by a coiled tail, whereas a mellifluous 'Q'-movement was the behavioral trait of third-stage A. cantonensis larvae outside the host tissue. In combination, the distribution of refractive granules, distinct head features, variations in sheaths, and behavioral characteristics can be utilized for differentiation of larval stages, and for distinguishing A. cantonensis larvae from those of other free-living nematodes
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