Cestodes

The class Cestoidea belongs to the phylum Platyhelminthes and includes parasitic tapeworms. Tapeworms have flat, segmented bodies consisting of a head, known as the scolex, and a series of segments, known as proglottids. The adults of this class are all parasitic and live in the intestinal lumen of a large number of vertebrate hosts, including humans and other mammals.\textsuperscript{1,2}

Anatomically, the adult tapeworm is constituted of a head (scolex) and a segmented portion (strobila) comprised of individual proglottids. The scolex is the only point of attachment between the host and the parasite. It may be equipped with suckers, hooks, or grooves, which aid in the attachment. The scolex contains ganglia. The neck region of the scolex, which is metabolically active, is the site at which new proglottids form.

The outer surface of adult tapeworms consists of a tegument whose structure and function are related to feeding. It is covered by evenly spaced microvilli, underneath which lie mitochondria, pinocytic vesicles, and related structures. The tapeworms, which lack a digestive system, must obtain all of their nutrients by actively transporting them across their teguments. Each proglottid is able to absorb a wide variety of low-molecular-weight substrates, but its precise metabolic requirements have yet to be fully defined.

The high levels of ATPase in the tegument are related to active transport but may also help the worm resist digestion by the mammalian host. Inhibitors of tapeworm ATPase, such as niclosamide, cause disintegration of adult tapeworms.

There are two layers of muscle in each proglottid—a longitudinal one and a transverse one—enabling the proglottid to move. The worms are innervated by a pair of lateral nerves, with perpendicular commissures branching out into the parenchyma of each segment. Although each segment is anatomically independent, they are all connected by a common nervous system that emanates from a set of cerebral ganglia in the scolex. Excretion or osmoregulation is associated with a lateral pair of excretory tubules.

Each proglottid possesses both male and female sex organs, but self-mating within a segment is unusual. Typically, sperm are transferred between adjacent mature proglottids of the worm.

References