

Encysted Trematode Metacercariae

I. Causative Agent and Disease

Trematodes or flukes are members of the phylum Platyhelminthes and the class Trematoda. Adult worms of the subclass Digenea are endoparasites occurring in all classes of vertebrates and use invertebrates as the first and sometimes second intermediate host. A metacercaria is the encysted juvenile trematode usually occurring in the second intermediate host that requires ingestion by the final host to become an adult worm. Depending on the trematode species, metacercariae are found in a variety of tissues and intermediate hosts including crustaceans. Encysted metacercariae in most hosts generally cause no overt disease unless present in numbers large enough to damage major organs and tissues. Many of these worms have been identified belonging to the family Microphallidae including the genera *Microphallus*, *Spelotrema* and *Opecoeloides*.

II. Host Species

Encysted digenetic trematode metacercarial stages have been reported in several marine crustaceans including: penaeid shrimps from the southeastern U.S.; various Gulf coast crabs including the blue crab and blue crabs from Rhode Island; crangonid shrimp and Dungeness crabs from Washington State. In Alaska, unidentified metacercariae have been observed in Dungeness crabs and undoubtedly occur in other indigenous crab species as well.

III. Clinical Signs

There generally are no clinical signs of parasitism because the encysted metacercariae cause no significant tissue damage and are too small to observe grossly. An exception is the microphallid

parasitizing the Atlantic and Gulf coast blue crab that often itself is parasitized by the haplosporidian, *Urosporidium crescens*. The hyperparasite causes the fluke to become enlarged and darkly pigmented resulting in black spots visible within the flesh of the crab, a condition known as "buckshot" or "pepper" crab that renders the meats unmarketable.

IV. Transmission

Microphallid life cycles generally include a snail host producing swimming cercariae shed into seawater that horizontally parasitize a crustacean host producing metacercariae that must be eaten by a final host, usually a bird, mammal or rarely a cold-blooded vertebrate. The adult trematode matures in the intestine of the final host and produces eggs released into seawater with feces to begin the cycle again (see metacercariae in bivalve section).

V. Diagnosis

Wet mounts of fresh tissues may show the encysted metacercariae which are small and extremely difficult to find. Usually, encysted metacercariae are observed during routine histological examination in connective tissues, musculature, nervous tissues, hepatopancreas and gonads.

VI. Prognosis for Host

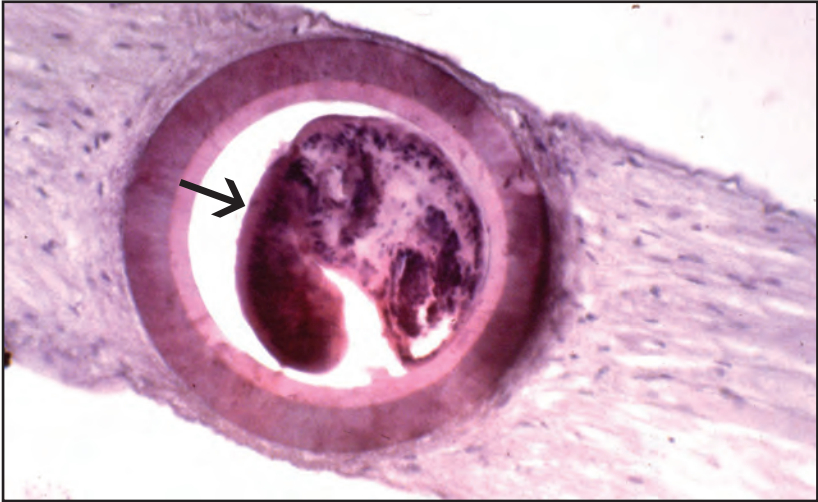
Encysted trematode metacercariae generally cause no harm to the host except in isolated cases where large numbers may cause tissue necrosis and dysfunction. Ataxia resulting from necrosis or compression atrophy of nervous tissues could result when metacercariae occur in the nerves, brain or thoracic ganglion as reported for Dungeness

crabs and crangonid shrimp.

VII. Human Health Significance

Because microphallid trematodes use warm-blooded animals as the final

host there could be a zoonotic human health concern if encysted metacercariae in parasitized crab meats are consumed uncooked.



Encysted trematode metacercaria (arrow) in cranial nerve of Dungeness crab