

Black Spot Disease (*Neascus* and *Heterophyids*)

I. Causative Agent and Disease

Black spot is caused by digenean trematodes (flukes) in the families Diplostomatidae and Heterophyidae. The cercarial forms of the trematodes penetrate the skin of a fish, where they encyst and develop into metacercariae. The fish surrounds the cyst with black pigmented melanin in response to the foreign organism. The black spots are often visible to the naked eye. These worms are present in both freshwater (*Uvulifer ambloplitis*, *Crassiphiala bulboglossa*, *Apophallus donicus*) and marine (*Cryptocotyle lingua*) fish.

II. Host Species

Salmonids and other freshwater and marine fish are second intermediate hosts worldwide.

III. Clinical Signs

Infested fish exhibit black, raised nodules in the skin which are often less than 1mm in diameter.

IV. Transmission

Fish are parasitized by exposure to water containing parasitized snails. The actively swimming cercariae from the snails penetrate the skin of the fish where they develop into metacercariae. The definitive hosts are fish eating birds and mammals that complete the life cycle by releasing eggs into the water with feces. The eggs hatch into miracidia which parasitize the snail hosts.

V. Diagnosis

Presumptive diagnosis is made by the observation of small, multifocal, slightly raised black spots in the fish skin. Confirmation is obtained by observing metacercariae in the cysts in wet mount preparations or histological

sections. Tissue sections reveal a thick, fibrinous capsule around the encysted metacercariae with the periphery of the capsule containing numerous melanocytes. *Neascus* is a collective larval genus for several genera and species of trematodes having characteristics of the family Diplostomatidae. More precise genus and species identification is based on marine or freshwater habitat, tissue site of encystment and other morphological characteristics of the encysted metacercariae.

VI. Prognosis for Host

Most metacercarial infestations of the skin and fins are relatively nonpathogenic.

VII. Human Health Significance

Generally these worms are reported to infect only poikilotherms, but experimental studies have indicated that metacercariae of *Apophallus donicus* from freshwater fish can parasitize various mammals including humans. The Center for Disease Control recommends cooking fish at 67°C for 5 minutes or freezing fish at -20°C for at least 7 d to kill worm parasites before ingestion.

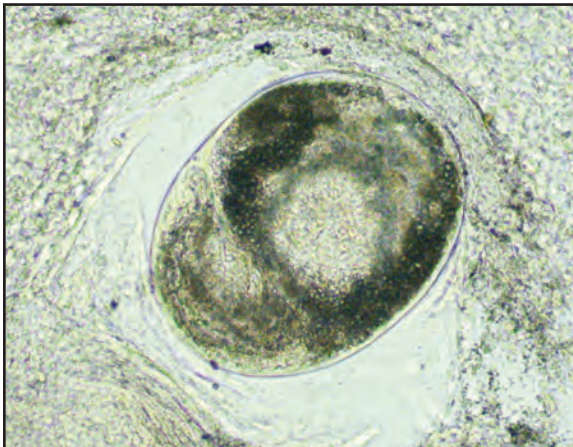
HELMINTHS



Typical black spots composed of melanin that surround encysted metacercariae of the larval genus *Neascus* in an Arctic grayling.



Marine form of black-spot heterophyid circumscribed by blue-green pigment on the caudal fin of a Bering cisco (photo: B. Collyard, ADF&G).



Encysted metacercaria of *Neascus*, X 1000.