



## Fish Health Issues

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FH Issues available online at <http://www.state.me.us/ifw/fishing/fishlab/intro.htm>

Volume 2, Issue 8  
September 2000  
Updated  
November 2002



### Black Spot (*Apophallus brevis*) in Brook trout

Sand grain sized black spots on the skin of brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*) are usually caused by a small immature larval trematode parasite named *Apophallus brevis* (Syn. *A. imperator*). "Black grubs," "Black spot disease," or "Neascus infection" can be found in many different fish species, and is a fairly common; however, the unsightly condition is caused by many different species specific parasites.

The final host for the digenetic trematode *A. brevis* is naturally the Common Loon (*Gavia immer*); however, a variety of fish eating animals have also been experimentally infected including: cats, pigeons, gulls and muskrats. Adult worms live in the loon's mouth where they produce eggs. The eggs are swallowed by the loon, pass through its digestive system unharmed and are released into the water with the loon's feces. The eggs mature in water and release the ciliated miracidia, which then swim away and penetrate the appropriate molluscs (snails or less often clams), often only those of a certain genus. These molluscs are the first intermediate hosts of the trematode.

In the molluscs, the miracidium grows to become a redia (a saclike animal with a pharynx and a gut), which may produce either cercariae or sporocysts (sac-like animals without a pharynx or gut).

The cercariae actively penetrate and migrate into the tissues of the second intermediate host, which is most often a fish. When a cercaria penetrates and migrates into the tissues of a fish, it causes obvious mechanical damage and hemorrhaging. The damage caused by one cercaria is negligible, but in greater numbers they may kill the fish. After the cercaria has localized and transformed into a metacercaria, little subsequent damage occurs, unless enough metacercariae accumulate that their collective mass interferes with the fish's metabolism. The infected fish must be eaten by the final host to complete the trematode's lifecycle. When the fish is eaten and digested by the loon, the metacercaria emerges from the fish flesh and migrates to the loon's

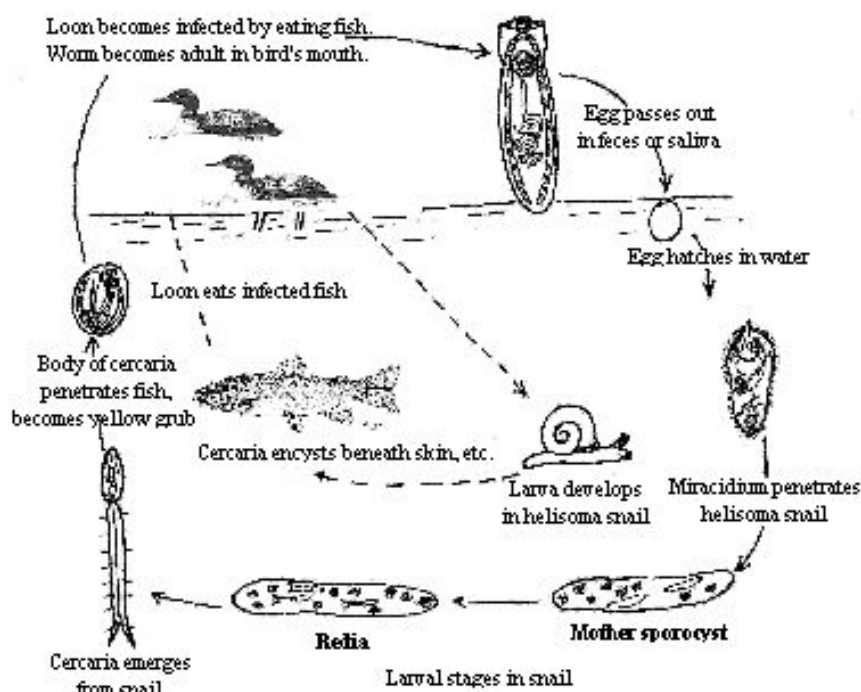


Figure 1. Lifecycle of Black Grub. (modified from Hoffman 1999. *Parasites of North American Freshwater Fishes*. 2nd Edition. Comstock Publishing, Ithaca NY).



Figure 2. Brook trout with heavy black spot infestation.

mouth where it matures to the adult egg producing worm. This completes its lifecycle. The worms are hermaphrodites having both male and female organs.

There is no practical treatment or control of this parasite available at this time.

### Special points of interest:

- *A. brevis* does not infect humans.

Although a related species has been found in humans, several other mammals and birds.

- Black grubs can be found in many different species of freshwater fishes.
- *A. brevis* can live for 4 years in a fish.
- Cooking fish kills the parasite.

Images in this document were made possible in part by a grant from the Maine Outdoor Heritage Fund.

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*last updated 05/26/2005*