

Relevant Literature

Conley, D., and M. Curtis. 1994. Effects of temperature and photoperiod on the duration of hatching, swimming, and copepodid survival of the parasitic copepod *Salmincola edwardsii*. *Canadian Journal of Zoology* 71: 972-976.

Conley, D., and M. Curtis. 1994. Larval development of the parasitic copepod *Salmincola edwardsii* on brook trout (*Salvelinus fontinalis*). *Canadian Journal of Zoology* 72: 154-159.

Poulin et al. 1991. Size, behavior, and acquisitions of ectoparasitic copepods by brook trout, *Salvelinus fontinalis*. *Oikos* 61: 169-174.

The Special Publication Series is a joint project between the Fish Parasite Laboratory at SMU and the Nova Scotia Department of Fisheries and Aquaculture aimed at providing scientific information to fishers.

We welcome inquiries about any aspects of parasites and fish that is of interest by the general public.

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**Parasites of Trout
In Nova Scotia**

“Gill Maggots”



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“Gill Maggot” of Trout

Brook trout (*Salvelinus fontinalis*) in streams and lakes throughout Nova Scotia are typically infected with a copepod ectoparasite called *Salmincola edwardsii*.

The parasite attaches to the gills, opercular region, and the base of fins by means of two arm-like appendages ending in a knob or *bulla*. The males are small and short-lived. Females are what you see on fish.

Left is a gill maggot from a local trout. The parasite looks like she is hoisting a trophy (the bulla). In between the two arms is the head and mouth, the latter grazing on adjacent trout tissue. The central globe is the main body or cephalothorax, with the pair of trailing egg sacs. Mature females can reach a quarter inch in length. The parasite is found on other trout in the genus *Salvelinus* throughout the Holarctic (northern Canada, Europe, and Russia).

Life Cycle

The life cycle is direct (*monoxenous*) because only one host, in this case brook trout, is required to complete the life cycle. The developmental stages are as follows:

- 1) Eggs are released from female parasites attached to trout. They develop quickly and in a few days form small free-swimming stages called *copepodids*.
- 2) The copepodids infect trout and develop into slightly larger and more complex *chalmisus* stages (I to IV), with molts taking place during growth. The parasites feed on host tissues and become pre-adults and then adults. Males live for approximately a week, whereas the parasitic females live a year or more.

3) The entire life cycle from egg to mature adult is completed in about 2 weeks at summer temperatures in Nova Scotia. Cooler water temperatures extend the time required to complete the life cycle.

4) Epidemics, in which parasite numbers per fish can reach the hundreds in just a few months, are known to occur in certain localities, but the reason for such outbreaks is not clear.

Other Facts

1) Species of *Salmincola* can cause significant tissue damage in and around the site of attachment, which may develop secondary infections with opportunistic bacteria and fungi present in the surrounding water. Gills of these fish are pale, and often filled with debris and mold. Significant impairment can occur with infected young-of-the-year trout, where even low numbers of the parasite can make breathing and swimming difficult.

2) *Salmincola edwardsii* only affects brook trout; there is no concern about infected trout leading to infection of Atlantic salmon. They just do not like each other biologically speaking.

3) The parasites are of no concern to human health and infected trout are fit to eat. Heavily infected trout will continue to lay eggs and spread the infections.

The Fish Parasitology Laboratory at Saint Mary's University is interested in hearing from you about fish parasites that you find. Just contact David Cone at the following email address: david.cone@smu.ca.

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