

Parasites of Trout
In Nova Scotia

“Gyrodactylid Ectoparasites”



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Relevant Literature

Bakke, T. A., J. Cable, and P. D. Harris. 2007. The biology of gyrodactylid monogeneans: The “Russian-Doll Killers”. *Advances in Parasitology* **64**: 161-376.

Cone, D. K., M. Beverley-Burton, M. Wiles, and T. E. McDonald. 1983. The taxonomy of *Gyrodactylus* (Monogenea) parasitizing certain salmonid fishes of North America, with a description of *G. nerkae* n. sp. *Canadian Journal of Zoology* **66**: 409-415.

Cone, D. K., and R. Cusack. 1988. A study of *Gyrodactylus colemanensis* Mizelle and Kritsky, 1967 and *Gyrodactylus salmonis* (Yin and Sproston, 1948) (Monogenea) parasitizing captive salmonids in Nova Scotia. *Canadian Journal of Zoology* **66**: 409-415

Mitchum, D. L. 1995. *Parasites of Fishes in Wyoming. Whoming Game and Fish Department*. 304 pp.

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 about parasites to fishers.

We welcome any queries about fish parasites found by those fishing.

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“Gyrodactylid Ectoparasites”

Species of *Gyrodactylus* are small tissue-feeding ectoparasites found on the skin, fins and gills of salmonid fishes in freshwaters of Atlantic Canada. These infections involve two species: *Gyrodactylus colemanensis*, originally described from rainbow trout in California, attaches primarily to fish margins of trout, and *Gyrodactylus salmonis*, originally recorded from brook trout in New York State, attaches to the body surface and the open face of the fins. Both species are widespread at trout and salmon farms throughout North America and sometimes reach epidemic levels under captive conditions. Neither species is thought to cause significant mortalities in the wild. These parasites are abundant but you will need a microscope to see them.

The cover photograph is a low power magnification (the scale bar is 50 μm or 0.05 mm) of these ectoparasites. It has a sticky anterior organ of attachment (prohaptor), a large pharynx, a simple gut containing black pigment, a central developing young, and a posterior organ of attachment (opisthaptor) containing various hooks with which to attach to fish skin.

There are 16 peripheral hooklets, two central hamuli, and a dorsal and ventral bar typical of these parasites as seen in the photograph at the top of the opposing page.

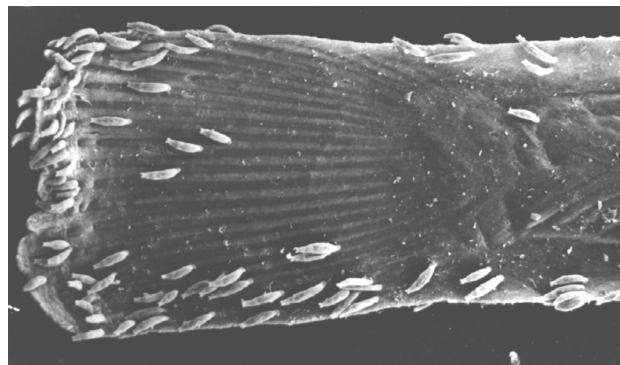


Scale 20 μm .

Life Cycle

These parasites have what is referred to as a “hyperviviparous reproduction”, or the giving birth to adults that are ready to give birth! The parasites are thus unusual in that they can transfer directly from fish to fish, possibly using the substrate and aquatic plants as a temporary substrate. While living on the body surface of a trout these parasites move about in an “inchworm” fashion grazing on the skin and mucus on the surface of a fish host.

Below is a photograph of a young brook trout infected in the laboratory with large numbers of *Gyrodactylus colemanensis*, each one measuring only 0.5 mm.



Other Facts

Atlantic salmon (*Salmo salar*) in rivers throughout Scandinavia in the 1970's experienced a major epidemic of gyrodactylosis involving *Gyrodactylus salaris*. The parasite is thought to have been introduced via stocks of infected salmon imported from the Baltics. The parasites exploded and caused significant mortality to salmon parr. In order to try and eliminate the parasites, adult salmon were collected from the various rivers and used as brood stock to produce hatchery raised fish specific to each river. The rivers were then poisoned (rotenoned) to kill all fish in the rivers and eliminate the parasite. Finally, the hatchery stocks were then introduced to their river of origin to start a new generation of parasite free fish. Needless to say this entire process cost governments in the region an huge amount of time, energy, and money.

This parasite is thought not to occur in Canada, although stocks in rivers draining into our north have not been examined in detail. Let us hope than *G. salaris* does not show up in Atlantic Canada for it would not be good news for our dwindling stocks of Atlantic salmon.

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.