

# *Myxobolus squamalis*

## **I. Causative Agent and Disease**

*Myxobolus squamalis* is not a protozoan but a metazoan in the class Myxosporea in the phylum Cnidaria (anemones, jellyfish, corals) based on molecular studies and the feature of discharging cells (cnidocytes) known as polar capsules. The species produces round spores having two polar capsules at one end. Parasitized tissues are characterized by cyst-like pansporoblasts under the scales that contain developing spore stages of the parasite. The scales are pushed up and often appear as bumps on the side of the fish.

## **II. Host Species**

This parasite is found mostly affecting anadromous Pacific salmon within the Pacific Northwest. In Alaska, *M. squamalis* is observed most commonly in coho salmon.

## **III. Clinical Signs**

Fish parasitized by *Myxobolus squamalis* have numerous white pansporoblasts under the scales. These spore-filled cysts raise the scales causing a discolored pitted appearance of the skin.

## **IV. Transmission**

Transmission of *M. squamalis* most likely occurs in freshwater and is based on known life cycles of similar parasites in this class of organisms. Following the death of an infected fish, the cysts under the scales rupture releasing the spores into the bottom sediments where they are eaten by an alternate host, probably an oligochaete worm. Infectious stages for fish (triacinomyxons) develop in the gut of the alternate worm host. The triacinomyxons are released to ambient water in large numbers with the feces of the worm and infect juvenile fish by entering

through the skin. The parasite undergoes several divisions toward final development and travels to the specific target tissues under the scales.

## **V. Diagnosis**

White cysts under the scales of parasitized fish are examined microscopically for spores characteristic of *Myxobolus squamalis*. Spores are typically 8-9  $\mu\text{m}$  in diameter with polar capsules of 3 x 4  $\mu\text{m}$  in width and length. However myxospore morphology is unreliable because *M. squamalis* is similar to several other myxobolids that share host species and geographic ranges. Molecular methods, including sequencing, may be necessary for confirmative identification.

## **VI. Prognosis for Host**

The effects from *Myxobolus squamalis* are benign and mortality of the host due to the parasite has not been reported

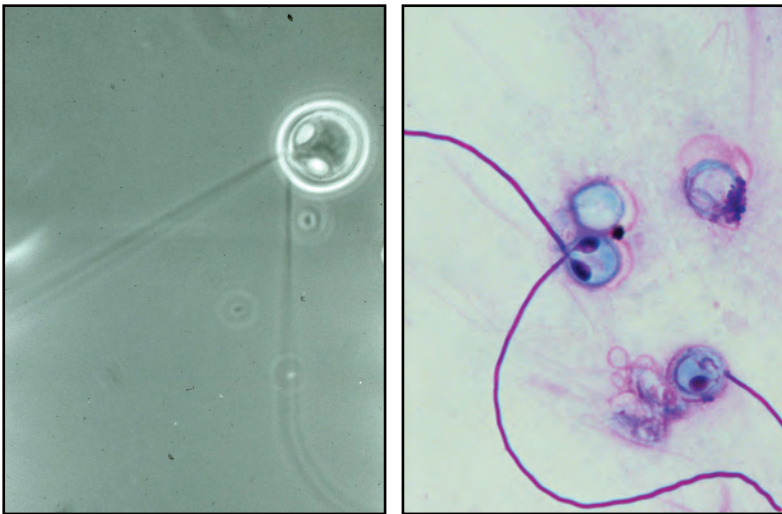
## **VII. Human Health Significance**

Although the cysts in the skin are visually unappealing when present in large numbers, there are no human health concerns associated with *Myxobolus squamalis*.

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Skin lesions typical of infection by *Myxobolus squamalis* in a coho salmon.



Wet mount (**Left**) and stained smear (**Right**) of *Myxobolus* spores with polar filaments discharged from the polar capsules (cnidocytes), X 1000.