Ichthyobodiasis (Costiasis)

I. Causative Agent and Disease

Ichthyobodiasis is caused by a flagellated protozoan of the genus *Ichthyobodo*, formally known as *Costia*. These parasites are very small (5-10 um) with both free swimming and attached stages that can easily be overlooked in an examination. *I. necator* is an obligate parasite infesting the skin and/or gills of fishes including salmonids. When present on gills, *Ichthyobodo* seriously reduces the ability of young salmon to adapt to seawater.

II. Host Species

This organism lacks host specificity and parasitizes a wide variety of warm and cold water fish species and amphibians worldwide. Although primarily in freshwater, there have been reports of marine or euryhaline strains/species. Fingerlings and fry are especially susceptible, although older fish also become parasitized.

III. Clinical Signs

Fish infested with *Ichthyobodo* are often anorexic and listless and will typically exhibit flashing behavior. In advanced cases a blue-gray film appears on the surface of fish caused by increased mucus production and general hyperplasia of epidermal epithelium. Gill hyperplasia and lamellar fusion (clubbing) can occur if gills are infested. Secondary bacterial and fungal infections are common.

IV. Transmission

This organism is horizontally transmitted from fish to fish. Subclinically parasitized fish are the reservoirs for the parasite in the environment. *Ichthyobodo* reproduces by asexual longitudinal fission where one cell produces 2 motile daughter cells, each with 2 flagella, that parasitize the same or different host. Motile forms attach by means of a flat disc with two small microtubules extending into the host cell but retain flagella. Infestation of a host must occur within one hour after division or the parasite dies.

V. Diagnosis

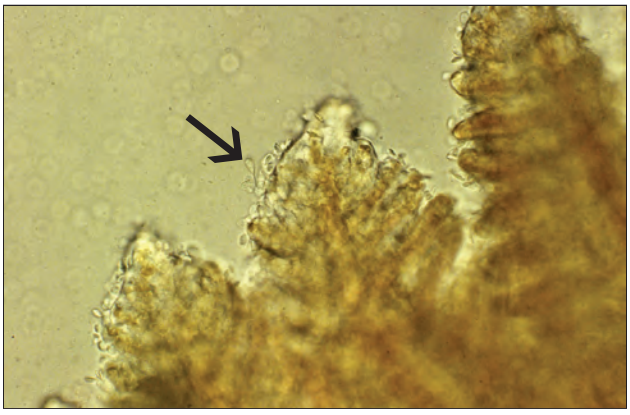
Definitive diagnosis is made by wet mount preparations of skin and/or gills. The organisms exhibit a characteristic asymmetrical, oval, flat-bodied attached form with a smaller number of free-swimming forms that are more ellipsoidal in outline. Two unequal flagella are occasionally visible arising from the anterior end and lie along a funnel-shaped groove on the organism's ventral side. The parasites can also be observed as attached forms in stained histological sections.

VI. Prognosis for Host

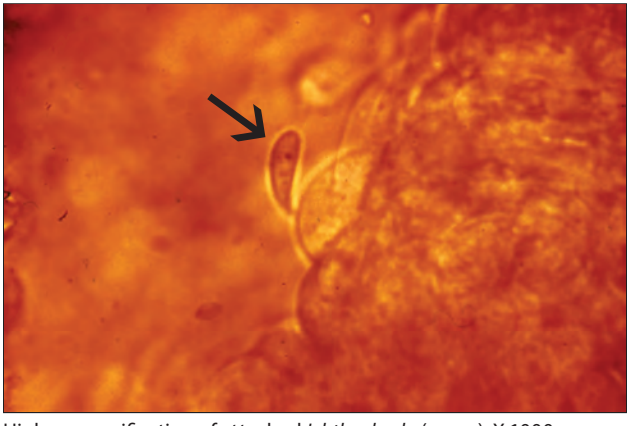
Ichthyobodo is considered one of the most pathogenic flagellate protozoans of salmonid culture causing significant mortality, especially in smaller juvenile fish. In the hatchery environment, *Ichthyobodo* must be removed by chemical treatment, generally formalin. Seawater does not have any effect on the parasite and the severity of the disease may increase among lightly parasitized fish that survive seawater transition but are held for further rearing.

VII. Human Health Significance

There are no human health concerns associated with *Ichthyobodo.*



Wet mount of salmonid gills showing numerous *Ichthyobodo* (arrow) attached along the periphery of lamellae, X 200.



Higher magnification of attached *Ichthyobodo* (arrow), X 1000.

Ichthyobodo attached to gill lamellae (arrow), histological section, X 100.