

3.2.9 External Infection by Ciliated Parasites

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The protozoans inhabiting the gills and body surfaces of fish are a diverse group of parasites. They occur in small numbers in almost all populations of fishes and only cause problems when predisposing factors in the environment place undue stress upon the host allowing heavy infestations to develop. In natural waters, these protozoa usually occur in very low numbers on the host species. Heavy infections in the wild are rare because water quality is usually good and fish are thinly dispersed. Heavy infections are more common in aquacultural situations where fish are crowded and water quality conditions may deteriorate. Presence of these parasites is to be expected in almost all lots of fish from almost all sources. Concern should not be over the presence of these parasites but with the degree of infection.

A. Name of the Disease and Etiological Agents

“External parasite infection” is the most common reference to this condition. It is comprised of four general groups of ciliated parasites: (1) motile Peritrichs (*Trichodina* spp., *Trichodinella* spp., *Tripartiella* spp.); (2) sessile Peritrichs (*Ambiphrya* spp., *Apiosoma* spp., *Epistylis* spp.); (3) motile Holotrichs (*Chilodonella* spp.); and (4) sessile Suctorina (*Capriniana* spp. formerly *Trichophrya* spp.). Other protozoan parasites including the holotrich *Ichthyophthirius*, the flagellated *Ichthyobodo* and *Spironucleus*, the *Myxosporea*, and the *Microsporea* are described in separate chapters in the Bluebook.

B. Known Geographical Range and Host Species of the Disease

1. Geographical Range

These parasites are cosmopolitan and occur throughout the world. All are found in freshwater fish. *Trichodina*, *Apiosoma*, and *Chilodonella* have all been reported on fish from marine or brackish water systems.

2. Host Species

Most species of fishes are considered susceptible to these parasite groups.

C. Epizootiology

In a natural state these protozoans occur in low numbers on the fish and usually cause no harm. Under certain conditions these protozoans can increase in such numbers that the host becomes severely compromised. Crowding and poor water quality can stress the host rendering it less resistant and more susceptible to parasitization. Crowding of fish will facilitate fish to fish contact and parasitic transmission.

D. Disease Signs

1. Behavioral Changes Associated with the Disease

Moderate to heavily infected fish may go off feed. Infected fish may scrape against objects and display flashing behavior. Fish may also gasp at the water surface.

2. External Gross Signs

Skin may display changes in pigmentation and have excess mucus production. *Epistylis* spp. may produce bloody lesions on scaled fish and cottony growths associated with erosion of fins and spines in all species. Gills may appear swollen, hemorrhagic, or with heavy mucus.

3. Internal Gross Signs

None recorded.

4. Histopathological Changes Associated with the Disease

Parasites will be present in tissue sections. Gill tissue may show epithelial hyperplasia, underlying inflammatory cells, epithelial necrosis, and an increase in mucus cells. Skin tissue may show the same responses.

E. Disease Diagnostic Procedures

1. Presumptive Diagnosis

a. Isolation and Detection of Pathogen

Diagnosis of external parasites is dependent upon clinical signs and observation of the organism in wet mounts of gill clips or skin scrapings using the 10X or 40X objective of a compound microscope.

- i. Motile peritrichs appear saucer-shaped and vary in diameter from 30 μ to over 100 μ m. They possess a sclerotized denticular ring and a ring of cilia on their outer margins.
- ii. Sessile peritrichs may be barrel or urn-shaped and vary from 30 μ to 150 μ in length. Individually attached or in groups by a dichotomous stalk.
- iii. Motile holotrichs are heart-shaped varying in body length from 30 μ m to 150 μ m. A pharyngeal basket is present and there are parallel rows of cilia on the ventral surface.

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- iv. Sessile suctoria have cilia present only on their larval stages whereas tentacles present on adult stages. They appear orange to brown in color and are from 50 μm to 100 μm in diameter.
 - b. Clinical Signs
Described above in sections D.1 and D.2.
 - c. Histopathological Examination
Not necessary for diagnostic purposes.
- 2. Confirmatory Diagnosis**
Presence of organisms in wet mounts is sufficient for confirmation of an external parasite infection. However, presence of a few parasites is not enough to cause or suggest a pathological situation; the parasite load must be heavy before this group can be considered a detriment to fish health. Confirmation of this group can be considered a detriment to fish health. Confirmation of this group down to Genus can be made using a compound microscope with 10X, 40X, and 100X oil immersion objectives. If speciation of the organism is deemed necessary, it would be best to submit the sample to a qualified specialist in protozoology.

F. Procedures for Detecting Subclinical Infections

Subclinical infections are probably universal among fish populations and should be considered a natural condition.

G. Procedures for Determining Prior Exposure to the Etiological Agent

None available.

H. Procedures for Transportation and Storage of Samples to Ensure Maximum Viability and Survival of the Etiological Agent

The sample of choice would be live fish that show clinical signs of the disease. Another alternative is to place fish in plastic bags (no water) and then these pack bags in ice for shipment. The number and distribution of protozoan parasites will change quickly in iced samples so these samples should only be considered useful for 10 hours. The least desirable method is to preserve the sample. Gill tissue and skin scrapings should be placed in 5% buffered formalin for 24 hours and then transferred to 70% ethanol or AFA for shipment and/or storage.



Figure 1. *Trichodina* sp. on the skin of a Channel Catfish.



Figure 2. Large numbers of *Ambiphrya* on the gill of a Channel Catfish.

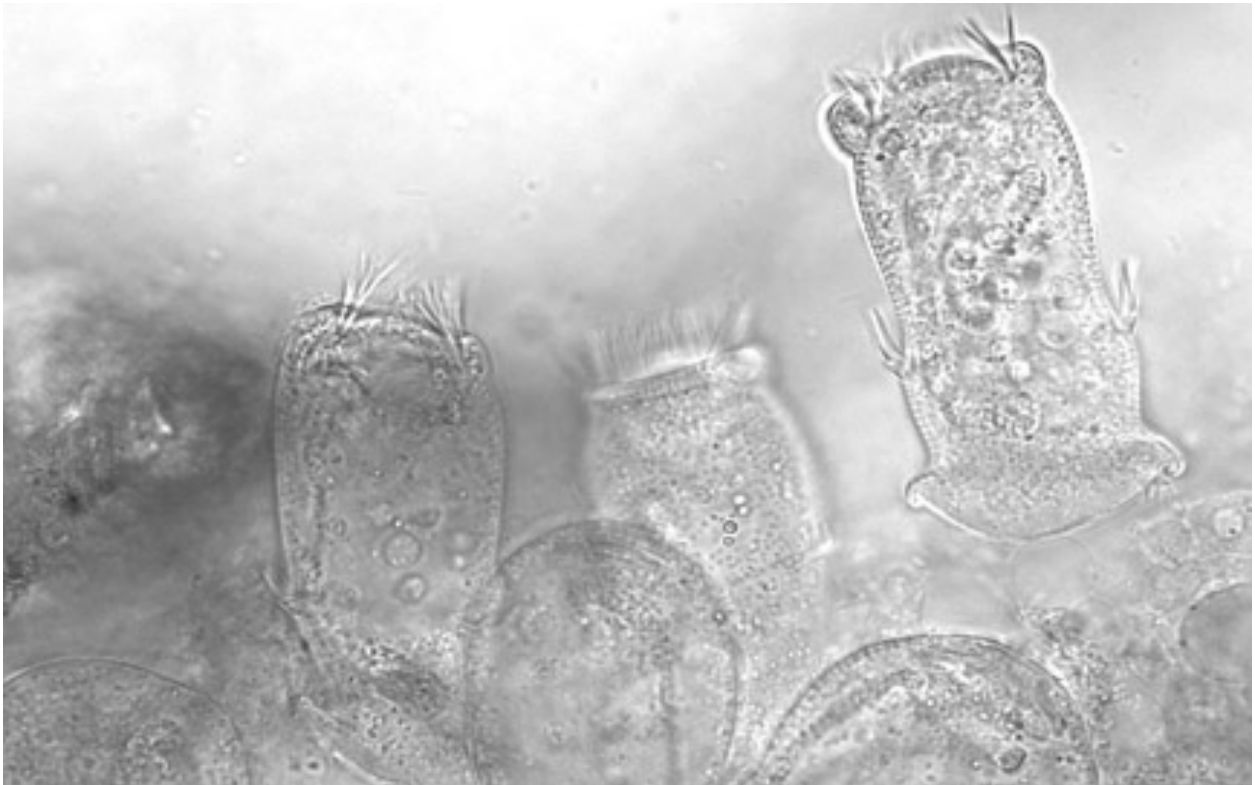


Figure 3. *Ambiphrya* on the gill of a Channel Catfish.



Figure 4. *Apiosoma* on the gill of a black crappie.



Figure 5. *Epistylus* on the fin of a Channel Catfish.

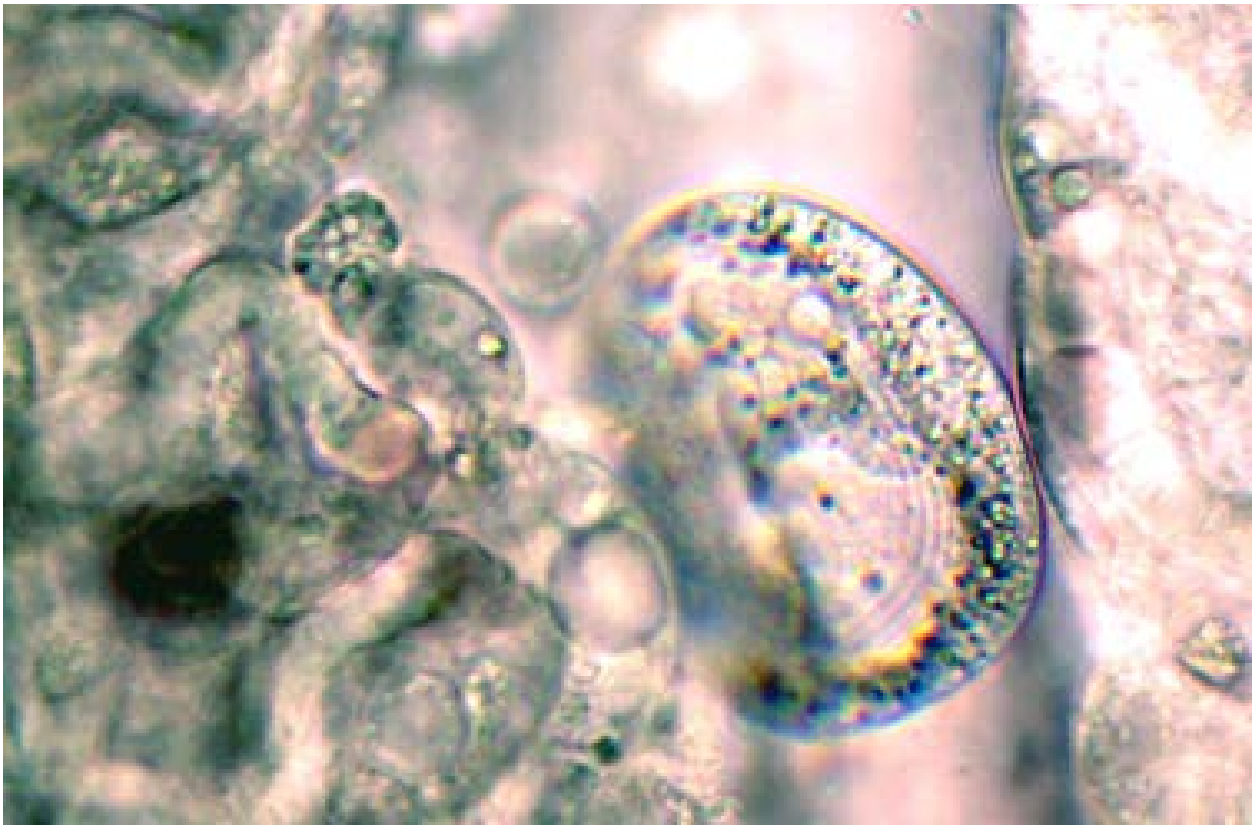


Figure 6. *Chilodonella* on a Goldfish gill.

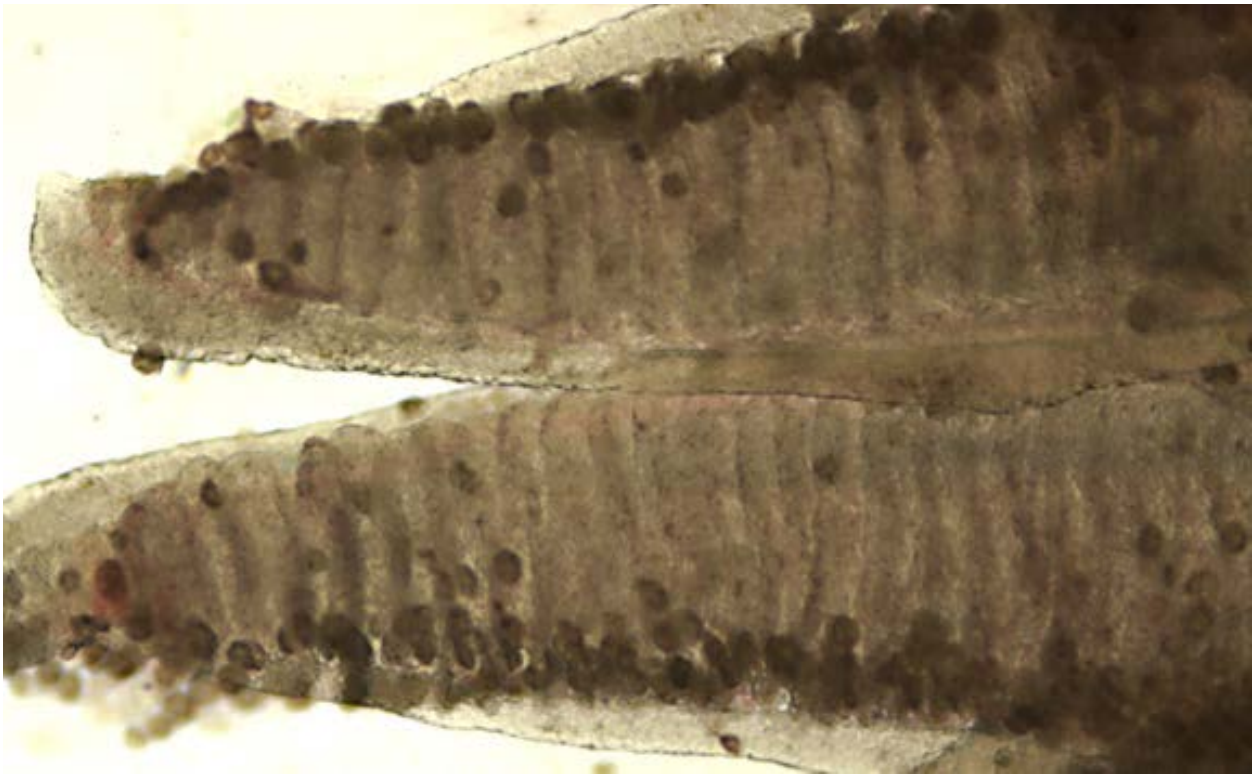


Figure 7. *Capriniana* on a Channel Catfish gill.

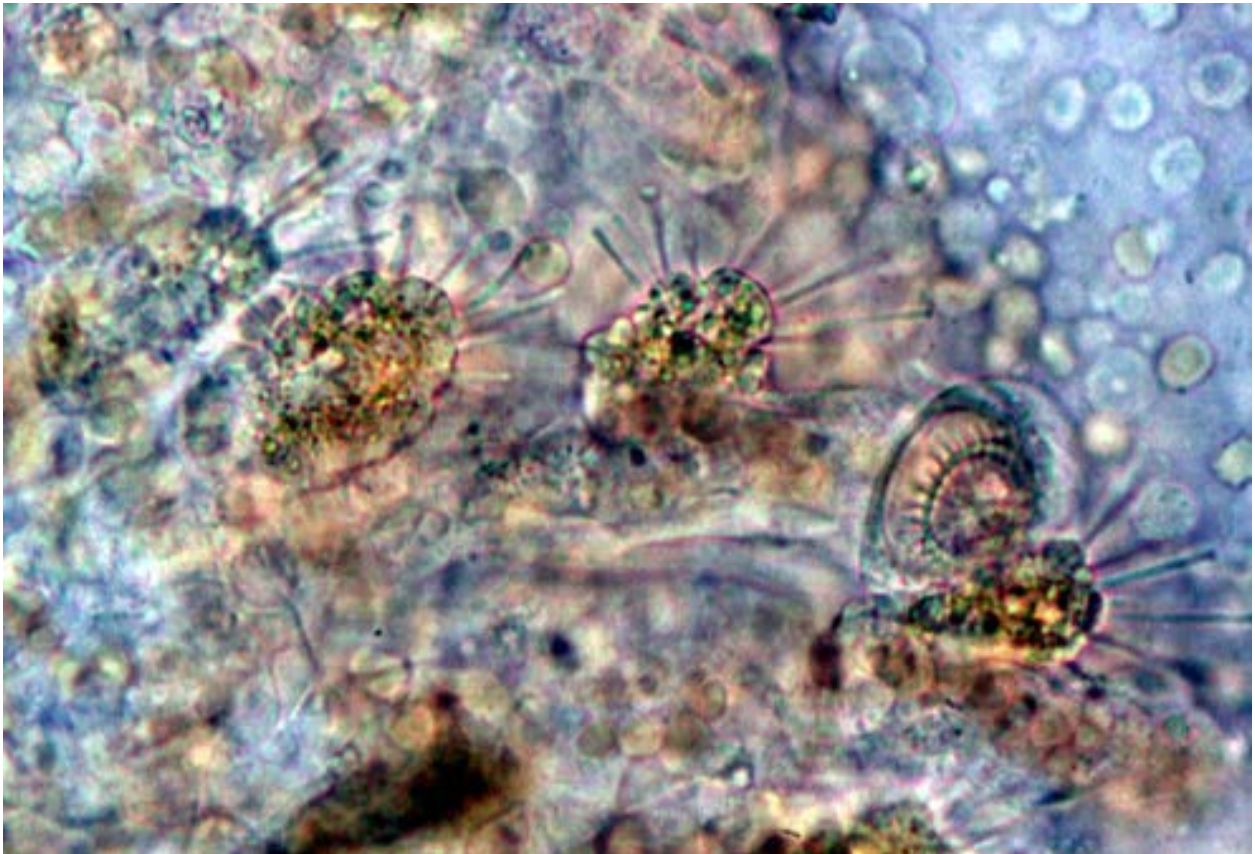


Figure 8. *Capriniana* on a Channel Catfish gill.

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