

Trichodinid Ciliates

I. Causative Agent and Disease

Peritrichous ciliates of the genera *Trichodina*, *Urceolaria* and *Leiotrocha* are common parasites of several species of marine molluscs. Under normal circumstances these ectoparasites are regarded as more commensalistic and harmless but when present in large numbers they may cause disease. *Trichodina* sp. is the most common genus and has been associated with recurrent large scale mortality of cockles in Germany and possibly oysters in France (a virus may also have been present) during warmer summer/fall seawater temperatures. The mortality described in parasitized bivalves was likely due to overwhelming erosion of gill tissues that disrupts normal respiratory function followed by possible microbial secondary infection.

II. Host Species

Trichodina sp. has been reported from various species of clams, cockles, scallops and oysters from Europe, the Atlantic coast of the United States and the Pacific rim. In Alaska, unidentified trichodinid ciliates have been found on the gills, palps and mantle tissues of Pacific oysters, basket cockles, rock and weathervane scallops.

III. Clinical Signs

Trichodinids observed in Alaska were found incidentally during routine histological examination of apparently normal bivalve molluscs with no associated mortality or other clinical signs of disease. Cockle and oyster mortalities in Europe and France that were associated with *Trichodina* infestations occurred mostly in juvenile or otherwise younger animals. Clinical signs included emaciated soft tissues, grey-colored digestive

glands, eroded and deformed gills with large numbers of the ciliates present.

IV. Transmission

Transmission of trichodinid parasites is horizontal via ambient seawater. Older less susceptible adult bivalve molluscs are reservoirs for the parasite which cannot survive long outside a host.

V. Diagnosis

Tissue wet mounts of trichodinid ciliates demonstrate a saucer or disc-shaped motile organism of variable diameter (33-103 μ m) that often rotates in place. Visible are a ventral ring of denticles (teeth) with a ciliary girdle and a dorsal adoral ciliary ring. Histological examination of gills, palps and mantle demonstrates an eosinophilic helmet-shaped ciliate with a large horseshoe-shaped nucleus, the ends of which appear as two "eyes" in most sections. Specific identification of genus and species is accomplished by silver impregnation staining of smears to reveal the arrangement and number of denticles as well as other features of parasite morphology.

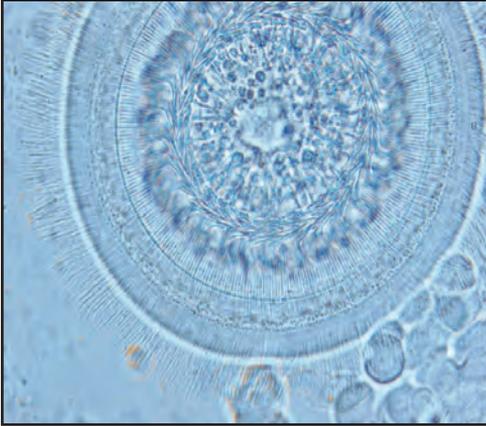
VI. Prognosis for Host

Trichodinid parasites usually occur in low numbers as harmless commensals feeding on bacteria, surface detritus and surface tissue cells of the host. Significant tissue damage is avoided by the regenerative capacity of a healthy host and the natural equilibrium between rates of parasite multiplication and accidental parasite expulsion with the normal flow of seawater maintained by the host in the pallial cavity. Environmental or physiological stress of the host reduces ciliary activity and the pumping action of the gills. This reduces the frequency

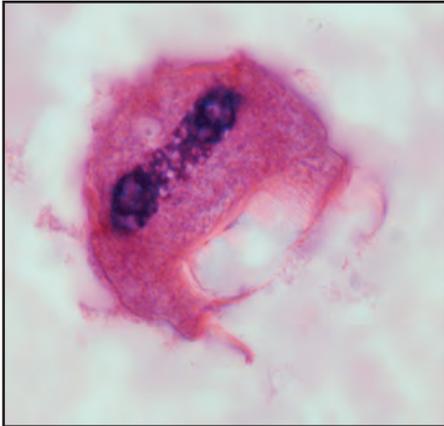
of parasite expulsion leading to increases in parasite abundance, tissue damage and excessive mucus production followed by possible death of the host. Older adult bivalves are reservoirs of the parasite that can infest the more susceptible juvenile molluscs.

VII. Human Health Significance

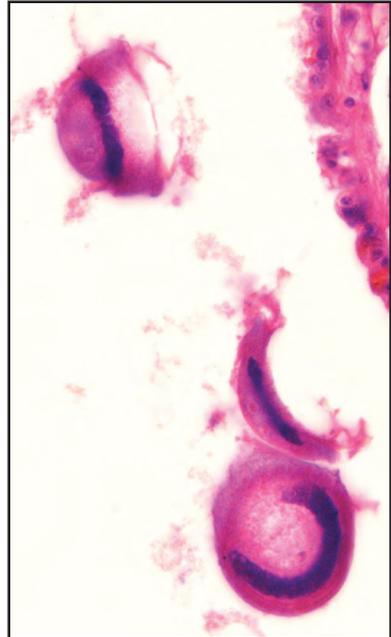
There are no zoonotic human health concerns with the occurrence of trichodinid parasites in bivalve molluscs.



Wet mount of *Trichodina* protozoan showing cilia and denticles



Histological section of a trichodinid ciliate on the mantle surface of Pacific oyster



Histological section of trichodinid ciliates on the gill surface of Pacific oyster