



Some Parasites of Freshwater Fish

Duncan Hill, (Melbourne)

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Some of the more obvious or commonly encountered parasites of freshwater fish are briefly described below. Further details of their life histories, effects on fish and methods of control are given in the references.

Most fish in the wild carry some parasites. These are sometimes obvious but more often are difficult to detect other than by specialist techniques and usually appear to have little effect on the host fish.

However, in times of stress, resistance of fish is often lowered and some parasites may greatly increase in abundance and affect the health of the fish. In this situation fish will often lose condition, making them more susceptible to predation, or may even die from the effects of the parasites.

Fish which are injured in some way, such as after an attack by a predator, may carry a wound which is then infected by a parasite.

Fungal Infections

Fungal infections are characterised by white growths, like cotton wool, on the body and fins of infected fish.

Usually fungus infects only fish which have suffered some wound or damage or are weakened or stressed from some other disease. The fungus is often identified as *Saprolegnia*, but several other species of fungus may also infect fish.

Protozoan (single-celled animal) parasites, such as *Costia*, *Chilodonella*, *Trichostrongylus* and *Ichthyophthirius*, may infect fish, especially under aquarium or intensive culture conditions.

Protozoans cannot usually be identified except under a microscope, but disease symptoms, such as a grey cloudiness of the skins and fins, laboured respiration, emaciation and unusual swimming behaviour, may give some clue to the causative agent.

Ichthyophthirius infections are known commonly as "white spot" because the parasite causes the formation of small, white cysts on the skin and fins of infected fish.

Tapeworms and Flukes

Several cestodes (tapeworms) and trematodes (flukes) are parasites on freshwater fish.

One such tapeworm is *Ligula* whose life cycle consists of several stages which are parasitic in turn on crustaceans, fish and birds.

Fish infected with *Ligula* exhibit grossly distended abdomens. The contained worms are white, segmented and may be up to 200 mm long, often longer than the infected fish.

Heavily-infected fish are weak and slow-moving, making them an easy target for predators. Galaxiids (minnows), particularly the Common Galaxias, are often infected by *Ligula*.

Several larval trematodes infecting fish causing what is commonly known as "black spot" because of the characteristic, small (about 2 mm in diameter) dark brown or black spots which develop in the muscle and on the body, fins, gills and eyes of infected fish.

When the parasite infects the fish it forms a cyst within the host tissue. The cyst then becomes surrounded by pigment cells, giving it the characteristic dark colour. "Black spot" infections occur in several species of freshwater fish, but galaxiids appear to be particularly susceptible to infection, with some fish carrying hundreds of cysts on the body and fins.

The organism causing "black spot" has been previously identified as *Neascus*, but there are several species of trematodes which have larval stages which cause black spots; these species have yet to be identified. The adult trematode is generally found infecting fish-eating birds.

Eustrongyloides is a nematode worm, the larval form of which is usually found in the muscle and internal organs of trout, redfin (English perch) and some native fish.

Heavily-infected fish may be severely emaciated and have numerous lumps under the skin, each cavity containing a thin, coiled, red worm about 20-30 mm long. Fillets taken from infected fish may have several worms in them, but if the flesh is cooked properly the worms are easily removed and the flesh is quite safe to eat.

Eustrongyloides is spreading steadily through Victorian waters, lakes particularly, and this is due to the natural cycle of fish-eating birds consuming infected fish and transferring either live worms or worm eggs to other waters. There is no means of control available, and several

waters in south-western Victoria now contain fish populations which are heavily infested with this nematode.

Leeches

Leeches are also parasitic on freshwater fish. They attach themselves to the skin with their sucker and feed on the blood of the host. They leave characteristic Y-shaped scars, which may be susceptible to infection by other parasites.

Freshwater mussels

The larvae (glochidia) of freshwater mussels are parasitic on fish. They are released into the water by adult mussels and, when a fish passes close enough to disturb them, the glochidia attach themselves to the skin or gills of the fish by means of their barbed valves. Irritated host tissue then grows and forms a cyst over each glochidium.

Development from glochidium to small mussel takes about 10 weeks, at which time the mussel bores through the cyst, leaves its host and settles to the substrate.

The presence of a glochidia infestation is indicated by numerous white or greyish "bladders" on the gills, skin and fins of the fish. Fish may be severely stressed by the attachment of large numbers of glochidia, particularly when the infestation affects the gills and may greatly impair respiration.

Glochidia are able to affect most native species but are not known to affect introduced species.

Crustaceans

Several crustaceans are parasitic on fish. *Lernaea*, although commonly called anchor worm, is in fact a crustacean. When attached to a fish, the head is buried in the flesh causing an inflamed, red wound. Only the worm-like body and twin egg-sacs are exposed.

The presence of large numbers of these parasites may severely stress the host fish, and the large, deep wounds produced are often then infected by bacteria or fungi.

Many native fish, such as Murray cod, golden perch and Macquarie perch, are susceptible to *Lernaea* attack, as are introduced salmonids (brown trout, rainbow trout and chinook salmon) and cyprinids (carp, goldfish, tench, roach).

Argulus, the fish louse, is a flat, oval, crab-like organism, with eight swimming legs and a small, flattened tail.

It swims freely through the water until it finds a host, then attached itself with the aid of two large suckers and forces its sharp trunk-like mouth into the fish to feed on its blood.

Large numbers of *Argulus* may weaken host fish because of the amount of blood they withdraw. The small, red, attachment sites are also susceptible to fungal infection.

Argulus commonly infects cyprinids, especially if held under aquarium conditions.

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