

Diseases of Fish Part 7

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In this article I propose to deal with a very common fresh water parasite viz. Gyrodactylus & a Marine parasite called Brookynella.



Gyrodactylus elegans. Photo shows embryo developing inside the parasite.

Gyrodactylus

Gyrodactylus causes a condition which is termed Gyrodactylidiasis, and this is the name given to the adverse effects that this **group** of parasites causes to fish when an outbreak occurs.

This very broad group of parasites is widely distributed, & attacks many species of tropical fish kept in Aquaria



Saltwater form of the parasite showing typical hooks which are common to all forms of this species. Photo by courtesy of Dr. Mo. of Central Veterinary Laboratory Oslo Norway.

For some reason Labyrinth fish do not appear to be often affected, some authors claim that darker coloured fish, are attacked less frequently, though this latter is not the writers experience.

The popular name of this family is called "Flukes" and in fact they are skin or gill flukes, which attach themselves to the skin or gills of the fish, and thereby can cause a great deal of damage.

As with almost all the common infestations, less than ideal environmental conditions such as poor water quality, overcrowding, stress by incompatible species etc, will create the conditions that may lead to an explosive & damaging outbreaks. The odd parasite is often present, and appears under good conditions, to remain dormant. Once however stress is caused by any factor an outbreak becomes almost inevitable, so remedial action is imperative.

These worms as in fact they are, obtain nourishment by "eating" skin fragments as well as the sucking the blood of the victim, this contributes to the pale appearance in chronic infestations.

The Hobbyist should suspect the presence of these parasites if he/she observes the natural colours of the fish appear to have faded, this is often concurrent with a clamping of the fins, or a folded appearance . Although in *Gyrodactylus* the infestation is more typically found on the skin, it often will manifest itself by attacking the gills. The parasite is about .75 mm long, & has at its anterior portion a sucker which has two central large hooks, surrounded by some sixteen smaller hooks for attaching itself to its host.

Gyrodactylus belongs to Phylum *Platyhelminthes* which are unsegmented flat worms, the Class or sub-division they belong to is Trematoda. This Class is again divided into 2 divisions viz. Monogenea & Digenea. *Gyrodactylus* belongs to the Monogenea, as it has only the need for one host, unlike the Digenea, which must have an intermediate host to complete the life cycle.

There are several varieties of *Gyrodactylus* , possibly the most common is *G.elegans*, others are *G. medius*, *G. gracilis*, but there are many more. All however have a similar life cycle, and cause for the most part identical symptoms. It is not therefore necessary for the Aquarist to concern himself with the species identification.

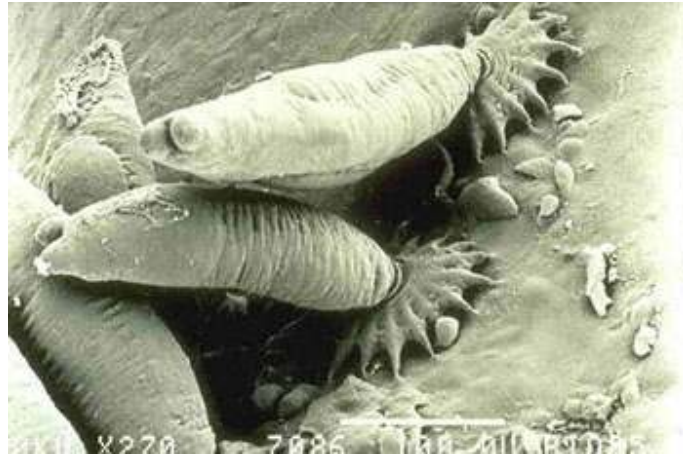
It is worthy of note however that there are salt water forms of this parasite viz. *G.salaris* as well as others, these can and do cause major problems form time to time in Salmon as well as other culture.

The sizes of the different forms vary just a little, from a low of about .3 mm, to a high of around .8mm. In some cases in early infestation they can be observed with the naked eye on the skin of the fish, but as the outbreak "deepens" the fish puts out massive amounts of slime, in a vain attempt to neutralize the parasite, this covers the organisms so that it is hard to see them individually.

A smear with something like a Q -Tip rubbed gently over the body of the fish, (holding same carefully but gently in a wet net), then applying the smear to a clean microscope slide, should enable the user, or even with a good magnifying glass, in the event that a microscope is not available, to make a certain diagnosis.

Typical signs of infection. *Gyrodactylus* & related species.

Water Less than optimum water quality, such as a lowering of the pH level, or high Nitrate or Phosphate readings can lead to an outbreak, stress caused by incompatible fish can also cause an outbreak.



G. salaris. Scanning electron photograph, shows parasite attached in typical manner to skin of Atlantic salmon. This method of attachment is similar for all forms.

Photo by courtesy of Dr. Mo. of Central Veterinary Laboratory Oslo Norway

Behaviour Fish will evidence lethargy, and swimming will become intermittent as the fish will tire very easily. Breathing at the surface, or just stationary "hanging" at the surface will be observed, as the fish try's to obtain sufficient oxygen when the gills are badly infested.

Fins . Fins can become clamped and/or ragged . Often small spots of blood may be observed at the base of the fins.

Body Lesions may become apparent on the body as well as excessive mucous. Colours of the fish become "faded" in appearance.

Gills Gills will usually become protuberant and usually are paler than normal. Excess slime can easily be observed.

Skin . Areas of haemorrhaging can be observed as well as ulcers, which typically have a circular shape . A slime can be observed over the body in advanced cases.

Histo-Patholgy A scraping of the skin, or gills will invariably show signs of the flukes , which will confirm the suspected infection. Be aware that secondary bacterial infection is very usual due to the protective epithelial layers of the skin etc, being adversely impacted.

Life cycle The species multiply by sexual viviparous multiplication, but there is evidence that a form of parthenogenetic reproduction can take place inside the mature parasite, & even within the "daughter" cell. The term given to this rather unusual reproduction method is called "paedogenesis". Although the parasite only gives "birth" to a single worm at a time, the gestation rate is so high that in a single month, under ideal conditions for the parasite as many as one million young can be produced. In this lies the danger that an outbreak presents, as far less than this number will cause massive mortality in the average Aquarium.

The newly born parasites can creep about on the skin of the host fish, or may search out a new host thus spreading the infestation. They must find a new host rather quickly or they will die, & this gives the Aquarist good opportunities to attack the problem, which if done quickly & correctly can have an excellent outcome.

Prognosis In most cases a cure is almost always possible, so the Aquarist should be aware of what to look for, and assuming that the problem is identified as a *Gyrodactylus* species that is causing the problem take remedial action as detailed below. If this is done, then losses can be and should be minimal. However if the problem is

not discovered, until it has severely progressed, then heavy losses will almost certainly ensue. When the gills of the fish are badly damaged, or heavy necrosis of the skin takes place, the damage is often irreparable. It should be noted, that as in all parasitic infestations that cause necrotic damage, that secondary infection by bacteria and/or fungus may well occur. One author has suggested that the parasites themselves may carry the infectious bacterium from fish to fish.

Treatment . There are several treatments that can be successfully employed.

1) The use of Formalin . Use 2-4 ml of Formalin in 10 Litres of water, preferably in a separate quarantine tank, for 30 minutes. If fish show signs of distress stop the treatment. Alternatively Formalin can be used as an extended treatment in the Aquarium itself at a dosage of 15-20 ppm . Water should be changed after 3 days.

2) Methylene Blue can be used successfully at a dosage taken from a stock solution of 1 gram in 100 ml of water. Use 3-6 drops of this stock solution in a Litre of the water to be treated. **Do not use this treatment in your main Aquarium as Methylene Blue, has a very adverse effect on the nitrifying bacteria, & also will cause the silicon bonding in your aquarium to become permanently dyed blue in colour.**

3) Acriflavine is also very effective & is used at 1 gram per 100 Litres . (We at Fish-Vet have a variant of this treatment with 3 active ingredients in our Fish-Vet product called Revive).

Other treatments have been reported as being effective, such as Benzalkonium chloride, Chloramine, as well as Potassium antimony tartrate. However there is not much current literature about the use of these, & I would hesitate to recommend them without more recent evidence.

To summarize then, Gyrodactylus in its various manifestations, is quite a common parasite, which if the fish are in good conditions, with clean water & unstressed, should remain at a level which will cause no problems. If for any reason these conditions should change for the worse, then an outbreak will often occur, which if spotted early can be brought easily & quickly under control.

Gyrodactylus is an excellent example, of how prophylactic treatment in a quarantine tank, can be used to preempt the likelihood of any such outbreak.

Brooklynella

Brooklynella hostilis is found as a parasite in Marine Aquaria far more often than is commonly recognized as it tends to be overshadowed by the more frequent & well known parasites viz. *Cryptocaryon irritans* and *Amyloodinium (Oodinium) ocellatum*.



Photo of Brooklynella parasite. Note cilia all along the outer surface. X 400.

It like so many others is a ciliated protozoan which in many respects resembles its counterpart in fresh water *Chilodonella* (see my previous article). When conditions become favourable to its reproduction, very rapid multiplication takes place , reproduction occurs by simple binary fission, and such massive reproduction can and does cause fatalities , which is brought about by severe weakening of the host fishes.

The literature reports many differing species of fish as being susceptible, & the first reports of this parasite were related by accounts from some of the more prominent (at that time) Public Aquariums, such as the New York Aquarium Steinhart, etc.

Typical signs of infection *Brooklynella hostilis*

Water There is little doubt that fish exposed to lowered water quality , and in particular the stress of elevated Ammonia /Nitrite levels such as are brought about in shipping, can induce an outbreak of this parasite. All the literature seems to confirm this.

Behaviour Fish demonstrate lethargy, will "toy" with their food, appearing to eat & then spitting it out. Respiration becomes difficult as the Gills become heavily parasitized , & can easily be observed.



Brooklynella hostilis infestation on a Damsel fish. Note typical faded body colour, as well as severe erosion of the Dorsal & Caudal fins.

Body A "faded" appearance of small areas becomes apparent, & such areas spread outwardly as the infestation progresses. Sloughing of the epithelium will occur in later stages.

Gills Gills will become massively parasitized and a smear or other examination of the gills should easily determine the cause of the infestation.

Skin As the "sloughing" occurs increasingly large areas of damage can be seen, as the skin becomes broken down by the parasites activities.

Histo-Pathology Parasite can be confirmed by skin or gill smears from suspected fish. Parasites are mobile and range in size from 60x80 microns to 40x48. In shape they are heart or kidney shaped (see illustration), and they have typically ventral organ for attachment to their host.

Treatment

The literature has very little on effective treatment, & the authors disagree on the application of Copper as treatment, (Stopskopf's book recommending its use, whilst Blasiola stating categorically it does not work). In this authors experience I have to agree with Blasiola, I have never found it to be effective against *Brooklynella*.

The combination of the following treatments & techniques have worked for me, on several occasions with varying degrees of infection, to eliminate the parasite, but I have had to employ at least 2 of the methods, and often all four. With careful attention the parasite can be brought under control (eliminated), but one should be aware there is no "24 hour" simple cure. Be very suspicious of anyone telling you that they have such a remedy.

1) Giving a "dip" in freshwater of the same temperature & pH as the Marine tank, for about 15 minutes (careful observation must be made, during this time, to avoid distress, & the fish removed, if major problem is observed).

2) Giving a bath in Sea water with Formalin added at a dosage of 1000 ppm for some 15 minutes.

3) Adding an Acriflavine product (such as Fish-Vet's Revive) to the tank water for a period of 2 weeks after the above treatments.

4) Taking **severe** steps to ensure that water quality is optimum along with the TOTAL removal of any detrital matter.

I would mention that G. Basleer mentions in his book that Quinacrin gives a good result, regrettably he does not give any figures for dosage, or any contraindications.

If any secondary infections with by bacteria are observed then the use of an antibiotic would be useful. The use of UV to help prevent secondary infection should be employed.

It is useful to point out to the Aquarist who is intending to buy fish, that the judicious way to avoid problems that this noxious parasite can bring to your Aquarium, is often best managed, by ensuring that your dealer has the fish in his tank for some 2 weeks prior to you taking it home. Most fish that will break out due to the stresses of transport, with this parasite will do so within this time.

To be fair to your dealer, you should show goodwill, by making it a conditional purchase, i.e. offer to pay for the fish, or at least part of it, provided he keeps it, and shows it is alright after the period of time mentioned has elapsed. *Brooklynella* is not an easy parasite to eliminate, so the effort to avoid it, is worthwhile.

I suspect that some of you as you read what would appear to be a depressing catalogue of parasites just waiting to attack your precious fish, may become disheartened somewhat, especially if you have had the misfortune to suffer one or more attacks in your early days in the Hobby. Therefore at the risk of being repetitive let me again emphasize that fish have an amazing ability to withstand infections, their immune system like most Vertebrates is well developed, & only when the conditions that we prepare for them or that they are exposed to, before we receive them are substandard, can we anticipate outbreaks which will adversely impact their health & our enjoyment of them.

Thus once again, everything you can do, to maximize the conditions in your Aquarium as well as ensure that you buy fish that have been properly collected, (not with Cyanide for example), held in conditions at all stages of the collecting/shipping processes, can you reasonably expect to have little or no problem.

I can hear some of you saying to yourselves, "how can I know, how the fish are collected /shipped etc". This is not easy, but careful reading of the literature, observing how your dealer handles his fish (does he make any effort at quarantine etc), asking about his suppliers, (does he import directly, or buy from a wholesaler,) does the wholesaler quarantine the fish etc. All of this will give you a far better idea of what to expect with the fish you buy. Furthermore, you should carefully observe how many dead or sick fish are evident in the dealers tanks, good dealers, who buy from good suppliers, will have far less than those that do not. All of this will enable you NOT to eliminate the risk, but greatly reduce it.

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