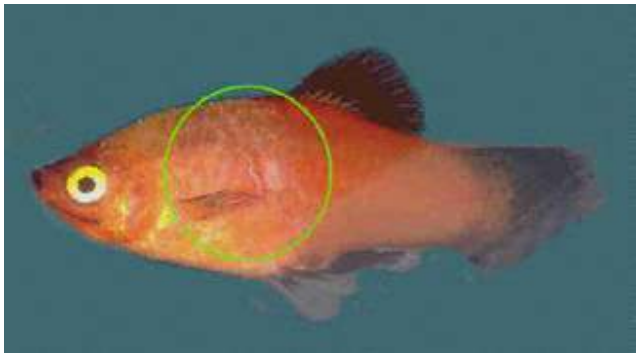
Diseases in Nature Part 11

By John *Shawn* Prescott

In this article we will deal with an all too common infection, which goes by various names

Most typically it is called Tail rot, or Tail and Fin rot. A typical characteristic of the disease is a rotting of the tail and very often the fins, which if unchecked will lead quickly to death of the infected fishes. This is a virulent pathogen, which can infect the vast majority of fresh water fishes, and has been found to occur in almost all parts of the world.



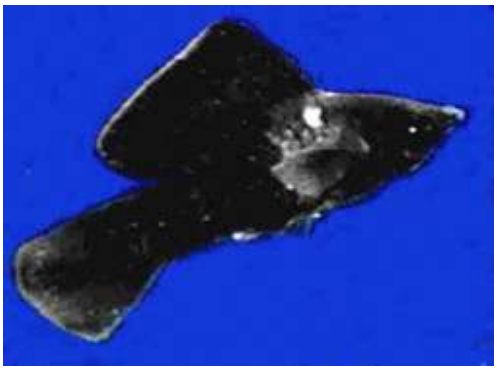
Formation of columns by Columnaris Bacteria, on side of Platy fish

The causative organism is a bacteria usually called today ***Cytophaga*** but previously was called ***Flexibacter*** and also ***Myxobacteria*** . The disease this family of bacteria causes is most often referred to as *Columnaris* , which describes the easily observed charateristic of the “piles” of haystack like organisms which congregate on an infected part of the fish.

Columnaris Bacteria building columns on scale x160

Scientifically speaking there are several variants of this group of bacteria, but as they all manifest similar pathology, as well as respond for the most part, to identical remedial or prophylactic techniques, it is not necessary for the reader to concern themselves with the minutiae of determinative technology, which is of course of interest to those engaged in scientific research.

The disease is brought on in many cases by fish that have been badly handled , and often have been subjected to undue stress. Among predisposing factors often noted, is a sudden rise in temperature. And the disease most frequently appears, when water temperature is above 64 º F.



Black Molly showing typical external signs of Columnaris infection

There are some interesting relationships between the quality of the water, and the virulence of the disease, and by being aware of these factors, it may be possible to use such information in some cases at least, as part of the remedial process.

In waters of a total hardness of 33 ppm as $CaCO_3$, (details of the breakdown chemically of this finding can be found in the quoted reference below) the pathogen was found to be at its most virulent, whilst in distilled water with zero minerals it was determined to be non pathogenic. This would indicate some form of obligate need for certain minerals in order for the bacteria to reproduce and further re-infect fish. However hobbyists should be aware, that no fish I am aware of will survive for a long period of time in pure distilled water, so any experiments along these lines, which could be helpful, must proceed in the direction, of studying the findings of the quoted researchers, and modifying suitably the waters accordingly, where this is practical.

Decaying *Gill tissue, turning black, sometimes an indication of Columnaris*

When fish are infected with this pathogen, the following signs can be anticipated:

Skin

There will be necrotic lesions on the skin, which often are white/grey coloured with an edging of red. These will quickly in one to two days, transform into ulcers with have an orange/yellow colour, caused by the bacteria decaying the underlying tissue.

Gills

Similar effects very typically occur on the gills, but may for the average hobbyist be somewhat harder to observe at least in the early stages. The progression of these ulcers, causes the fish to have great trouble with its respiration, and thus can quickly lead to fatalities. If the gills are examined, excessive amounts of mucous, are to be expected.

Behaviour

The fish will become very listless and lethargic, often will hang at the surface, trying to breath there, although on occasion, the fish will rest on the bottom of the tank. Reluctance to feed is very typical and the fish will become anorexic. Respiration is often rapid, as the fish fights to overcome the damage done by the infection to its gills.

Body

In some cases, the lips of the fish, will become swollen and macerated, and a milky slime like film can be observed with the naked eye on parts of the body.

Fins

Large milky patches can be seen quite easily on the fins of the fish, and this is usually an indication that the disease has progressed to a degree that cure will become much more difficult. One typical sign is the appearance of a “saddle” shaped lesion usually around the area of the dorsal fin, and this occurs so often, that the name “saddle back disease” is often used in aquaculture to describe this infection.

Water

Temperature is often elevated beyond what is normal, or the fish have been exposed to a sudden rise in temperature. Furthermore, the quality of the water, is a vital component, in getting this disease under control. Excessive detritus and less than ideal filtration, will ensure the spread of the infection. Hard water seems to make the spread of the bacteria easier than soft.

Histo-pathology

Spread of bacteria in the blood stream are a frequent occurrence, and these are referred to as “bacteremias”. When this occurs often other bacteria such as Aeromonads will invade as well as the Flaxibacter species, and these “bacteremias” can lead to a rapid demise of many fish.

Description of the organism

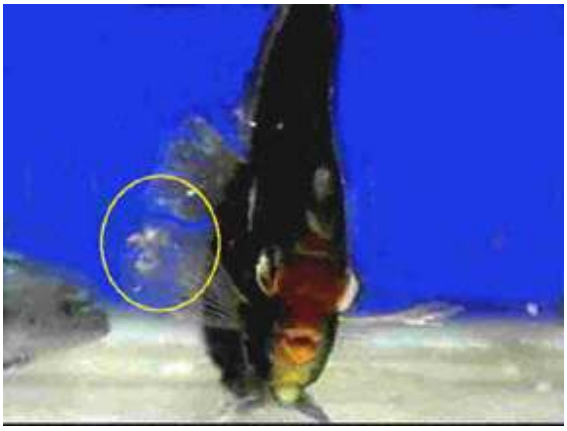
The bacteria are thin rods, (0.5- 1.0 microns in diameter, and some 4-10 microns long). Their most noticeable feature is a unusual “gliding” motion, which is not observed in other species. In wet mounted specimens they can be seen piled up into large columns which have given one of the common names to this infection.

Culture of the organism is best done at normal room temperature , and there is a culture media available called Cytophaga media), which is used for this purpose.

Transmission of infection

Once established the infection will spread through the water column, and potentially can and will infect most fish, with which it comes into contact. Heavy losses must be anticipated unless rapid identification and treatment are instituted immediately. The infection can be expected to spread most rapidly if water conditions are less than ideal, and factors that have been observed to enhance the pathogenicity are low oxygen values, hard alkaline waters, excessive nitrite levels, and even the presence of certain trace elements such as arsenic. (see refs).

The bacteria have been observed to thrive on uneaten food, and there is little doubt that they exist without being a problem in most aquaria. When however the fish are stressed, by less than ideal conditions, or when some new fish are introduced without quarantine procedures being observed, and the water in the aquarium is not ideal, then the chances of an outbreak are greatly increased.



Discus fish with acute signs of Columnaris infection

I would stress to the reader, that this disease, can be horrific should it break out, but certainly this is one infection, that can almost totally avoided, just by following good husbandry practices in your aquarium. The avoidance of stress by the routine maintenance as detailed below, should avoid any occurrence of this infection.

Such practices should employ the following techniques.

1. Ensure that you have an adequate and suitable filter for your aquarium, and keep it serviced at all times.
2. Quarantine, for a period of about 10 days, all new fish before introducing them to the aquarium.
3. Do regular water changes of around 10-15% of the water volume weekly.
4. Ensure that no uneaten food, or detrital matter is allowed to accumulate on the gravel bed of your aquarium.
5. Do weekly water quality tests, to ensure that no build up of unwanted nitrites or other undesirable measurements occur without you having time to take suitable remedial action.

Should despite all your best efforts, the infection breaks out, and you have identified the pathogen, as meeting the criteria as shown above, then the following types of treatment can be employed, and if used in good time, should minimize losses.

Treatment

The most popular drugs used in mild cases of infection are a quaternary ammonium dip, for a short period, or a more prolonged bath in potassium permanganate solution. Some persons advocate using copper sulphate, but in this writers experience, the risk of further damage to the gills of the fish, is too great, and I do not recommend this drug for this disease.

Typical *patch on back of young trout due to Columnaris i.e. "Saddle back*.

I will not try here to give any dosage levels, as your dealer will probably carry many variants of treatments using the above as the active ingredient. As the concentrations will vary from manufacturer to manufacturer, it is better to follow their dosages, but do make allowances for the quality of your water, as well as how far the diseases has progressed, when this is appropriate.

In severely advanced cases, when the disease has already progressed to the point that fatalities, have either already occurred or it is evident that they happen momentarily, there is as I pointed out earlier , a high possibility that further bacterial systemic infection will take place. In such cases, only the use of powerful antibiotics have any real chance of saving the fish, and the one which is most commonly used in this condition with good effect is oxytetracycline. This however needs in all European countries a Veterinary prescription.

"*Yellow/brown mouth sign typical of Columnaris infection*"

I would stress here, that there are very good reasons, why the hobbyist should **NOT RUSH** to use antibiotics as a first tool, when faced with such an infection. Also such drugs are **NOT** available in your aquarium dealer, and there are many down sides to trying this antibiotic first, including the fact that this drug, as well as many others, are becoming less potent, due to resistant strains of bacteria now occurring everywhere on this planet, ans well as for an ever increasing number of drugs. Furthermore, for the use antibiotics, one should be used getting good professional advice, as the tendency of the average untrained person to quit using the such, at the first sign of a cure, leads to exactly the kind of resistant strain, as well as too often a reoccurrence of the outbreak. You may be able to get your local veterinarian to assist you in how to treat your tank, should such be necessary.

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