

Columnaris (Fin and Tail Rot)

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 fishes, and has been found to occur in almost all parts of the world.

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 characteristic of the "piles" of haystack like organisms which congregate on an infected part of the fish.

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°F.

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 recovery process.

In waters with a total hardness of 33 ppm as CaCO₃, (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, while in distilled water with zero minerals it was determined to be non pathogenic. This would indicate some need for certain minerals in order for the bacteria to reproduce and further re-infect fish. However hobbyists should be aware, that no fish we aware of will survive for a

long period of time in pure distilled water, so moving infected fish into a hospital tank filled with distilled water is not a practical option.

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

Skin. There will be necrotic lesions on the skin, which often are white/gray colored with an edging of red. These will quickly transform (in a day or two) into ulcers with have an orange/yellow color, 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.

Behavior. The fish will become very listless and lethargic, often hanging 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.

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 an 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.

We 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 detritus 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

As noted previously, water quality plays a vital role in the prevention and cure of this disease. Prior to initial dosing of any medication to the aquarium, one should perform a large water change (30-50%) with a thorough gravel cleaning in order to remove excess detritus and waste from the substrate.

There are several medications in the marketplace to treat Columnaris. One should follow the manufacturer's instructions for treatment, as different producers, use different concentrations, & it is therefore impossible to give a standard treatment for all the medications out there. Some persons advocate using copper sulphate, but in our opinion, the risk of further damage to the gills of the fish, is too great, and we do not recommend this drug for this disease.

At Fish-Vet we produce several very effective treatments for this condition. **Aqua Pro-Cure** and **Revive** are both a blended mixture of several components to treat this and other diseases. **Acriflavine-MS** and **Metro-MS** are single compound medications, specifically acriflavine neutral and metronidazole respectively, which will also bring this disease under control. Please note that **Aqua Pro-Cure** and **Revive** are reef and invertebrate safe which makes them the treatment of choice for such an aquarium.

In treating the fish, one should always make allowances for the degree of infection, as weakened fish may not always withstand the full dosage, either in strength, or period of time. This call is one which either one builds up experience over time or with the help of a dealer whose expertise you can trust.

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.

Refs.

Chen C.R. et al (1982). Studies on the pathogenicity of *Flexibacter columnaris*-1. Effect of dissolved oxygen and ammonia on the pathogenicity of *Flexibacter columnaris* to eel (*Anguilla japonica*). CAPD Fisheries series No. 8 Rep. Fish Dis. Res. 4: 57-61

Fijan N. (1968). The survival of *Chondrococcus columnaris* in waters of different quality. Bull. l'Office Inter des Epizooties 69: 1159-1166.

Hanson L.A. and Grizzle J.M. (1985). Nitrite-induced predisposition of channel catfish to bacterial diseases. Progressive Fish Culturist 47: 98-101.

Stoskopf M.K. Fish Medicine Publ. W.B. Saunders 1993. pp 271-272.

Gratzek J.B. Aquariology. Publ. Tetra Press. 1992. Pp. 261-262.