

Diseases in Nature Part 10

by John *Shawn* Prescott

This article will be a start in examining the many bacterial infections to which are Aquarium fish are prone.



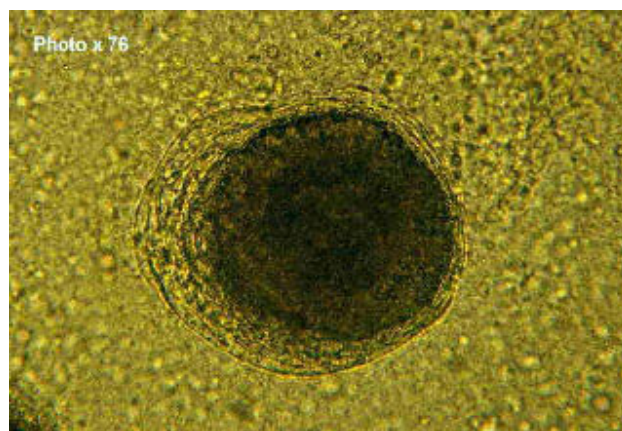
Tuberculosis with raised Tumour development

Before dealing with the specifics, I would like to reiterate what I stated at the outset of this series, as it is most important for all of you, who wish to prevent or cure any of these potential hazards.

Bacteria including the non pathogenic as well as pathogenic forms are usually present in small numbers on most fish. They in normal situations seldom cause any problems, as the fish's own quite adequate immune system is more than capable of fending off any infection which may become chronic.

However if parasitic infestations become severe, so that major necrotic damage is done, to the skin, fins, gills etc of the fish, then the opportunistic bacteria will often invade the eroded area, leading quickly to a major infection, which too often can be fatal.

This situation can arise in another way, without the presence of parasites . That is when for any number of reasons the fish become stressed. This lowers their resistance, so that latent bacteria, can then quite quickly manifest themselves, causing a problem for you the Aquarist. Such infections can in some cases, then spread to other fish, though this is not inevitable.



Tuberculosis granuloma in the Liver x 76

The reasons for stress are worth remembering. Among them are poor handling in the many steps of the way, from the farm or capture, to the Importer, then to the store, and finally to you the Hobbyist. Coupled with rough handling, often comes poor water quality. Also the placing together of incompatible species. Any or all of these, will cause trauma, stress, & a lowering of the fish's natural immune system, with the consequent breaking out of a disease, that in other circumstances may never occur. Thus it only sensible, if you wish to minimize your risks, that you try to ensure that **NONE** of these factors will apply to your specimens. It may take a little more trouble, but your reward will be fine healthy fish, and none of the heartbreak of seeing a prized specimen, succumbing and even dying to a problem, that might with a little foresight have been prevented.

Unfortunately with all the best intentions, many of you will still encounter from time to time, such problems, and we will need therefore to have an idea of the various bacterial diseases, which we may encounter, and what signs we should use to identify them, as well as remedial techniques, to be used where such exist.



Eye destroyed by TB Granuloma

It should be noted that for the purposes of identification that bacterial diseases are divided into two broad categories. These are Gram-negative and Gram-positive. This means that prior to the specific tests that determine the particular pathogen we divide them according to a simple Gram stain. This Gram's stain is a complex formula used today throughout the world as a first determinant to identify the major bacterial group.

When swabs containing the bacteria are stained with this formula if the tissue colonies of bacteria stain Purple or Blue, then Gram positive bacteria are present, if Pink or Red is the result then Gram negative are present.

The majority of bacteria we will meet in Aquaria, are of the Gram negative type. The importance of this to the Aquarist is that the treatment is usually different for the two forms, and obviously to have any success we must know what disease we are dealing with **BEFORE** selecting any treatment.

It is also a fact, that in many cases of opportunistic infections, that mixed colonies of bacteria will be found, as they in many cases, will enter the wound, created as I already stated, by a parasite the ideal place for an invasion. Thus we often will opt for a broad spectrum treatment, if we suspect that this may be the case.



A practical problem, that you as Hobbyists will encounter, is that in the first instance, it is not easy to find Veterinarians who have the specialized knowledge of fish pathogens to identify the precise infectious agent. Secondly the economic value of any given fish, for the most part, will never be worth the cost in pure economic terms the fees a Laboratory or a Veterinarian, would charge for such work. This work requires much specialized equipment, and knowledge , as well as some expensive consumables.

Furthermore assuming that you find such a qualified person, or laboratory, and are willing to pay the asked for fees, the time element may render the answer academic. Most tests will take a few days to get the absolute answers, during this time, in some instances at least your fish may have passed on to another world, or at a minimum, will be more sick, than when you began.

Thus we need to be aware to the extent that is possible of the indications of the bacterial infections that we may encounter, and take such steps as are prudent, to try in most cases to remedy the problem. You should be aware, that those labs or Veterinarians who can do such work, are typically working with large Aquaculture farms, or river boards, where there is a considerable economic value involved, often running into a million pounds or more, of fish, which can be endangered. Thus these specialists do exist, but for the most part they are far removed from the problems which the Aquarist may encounter, even though in a great many instances the disease can be the same bacterial form which they encounter in their daily work.

I now propose to select certain quite commonly encountered diseases, and give the reader the most encountered signs, so that hopefully with this information, along with the aid of their trusted local dealer, some extra good literature, or a professional advisor, they can possibly both identify and apply suitable treatments.

The first pathogen we will deal with is **Mycobacteria** .

This Pathogen has a couple of forms viz. *Mycobacterium marinum* , and *Mycobacterium fortuitum* .

Both of these are in fact Gram positive and they give rise to a form of piscine Tuberculosis.



Miliary lesions (abscesses) on internal organs due to Mycobacterium fortuitum in adult chinook salmon

Although this disease can in fact infect almost all fish, certain species seem more susceptible than others. Among these are Black Mollies, all Gouramis, labyrinth air breathers, Neons & other Tetras, as well as most species of the Carp family.

The observable signs are : Lethargic movements, major wasting, Loss of scales & Fin tissue, “Popeye” skin ulcers often with small haemorrhages, also edema.



Open TB with necrosis (Gourami)

Most species of fresh water as well as salt water fish are susceptible, and it is **VERY IMPORTANT** for the Hobbyist to be aware, that this is one of the few forms of fish disease, that is **communicable to humans** . This transmission, when it takes place, usually manifests itself with large melanomas on the arms of the fish-keeper. They can spread, and are very difficult if not impossible to eradicate. Any Hobbyist suspecting therefore that they may have encountered this disease, is strongly advised to wear surgical type gloves, when handling any fish, to sterilize all nets & other items that may come in contact with the fish, and notwithstanding all these precautions, to “scrub up” after handling them. These melanomas usually take some 3-4 weeks after exposure before manifesting themselves, so it is essential that the Hobbyist be aware of the danger, and take precautions, as the writer is aware of a few cases, in which the unfortunate Hobbyist has become infected and has these disfigurements for life.

Histologically in doing a postmortem we may expect to see, a number of white to gray nodules on the liver, kidney or spleen. One often finds necrotic black tissue eating away at the internal organs.

Prognosis In severe cases it is seldom possible to make an effective treatment.



Typical nodules growth on internal organs on TB infected fish

The disease is a slowly progressive one, and can take quite a long period of time, before it becomes fatal. It does not seem to spread from one fish to another, though there are cases recorded where this would appear to have occurred.

Treatment, as recommended by Stopskopf, is a combination of doxycycline & rifampin. These will not however be available from your local store and would have to be obtained from your Veterinarian with a prescription.



Loss of caudal peduncle ("tail rot") due to myxobacteria

To try and ensure that the problem does not spread to other fish, you must take steps to ensure that your water quality is of the highest standard. Although I am against the continuous use of UV sterilizers, in this case I would approve their use. Furthermore any obviously far gone fish should be removed from the main tank at least, or even humanely "put down". Normally if such methodology is carefully adopted then the problem can be brought under control.

Most observers believe that the causative organism is ubiquitously present, so that it is very difficult to eliminate it entirely. However if effective husbandry is employed, with cleaning of the gravel, along with good filtration as well as regular water changes, coupled with a varied diet which should include some live food, and the addition of a good vitamin mix, the problem can be eliminated as a cause of mortality. This will not apply of course to any fish that have developed the infection to such an extent that they have wasted away, and in such

cases as I have said it is better to put them kindly to sleep, this can be done, by placing the fish in a small container with water and adding an Alka Selzer tablet. Do NOT dispose of the carcass by “flushing” it down the toilet, as this is a prime way to spread the disease. Place the fish in some foil and dispose of it with the solid waste of the household. Also do not feed the dying fish to larger carnivorous fish, as this an excellent way to spread the infection.

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Refs .

Aquariology Master volume Tetra Press. Pages 255-256.

Fish Medicine Ed. Dr. M. Stopskopf pp 559-560.