

Diseases of fish Part 6

By John *Shawn* Prescott

In this article we will deal with a freshwater parasite *Trichodonella*, (which has two other closely related types see below. Also for Salt water enthusiasts we will deal with the parasite *Unonema marinum*. Also a few passing words at the end on *Cyanobacteria* aka Red Slime Algae.



Trichodina, circle shaped skin Parasite on Gill filament(side view)

Trichodonella

This parasite has 3 different types (aka genera), which are called *Trichodina* , *Tripartiella* , & the most common form *Trichodonella* . All three of these are distinctly circular in shape, with a band of cilia around the circumference of the organism.



Trichodina, the circle shaped Parasite

In size they vary from 40 microns to 60 microns in diameter, & have an easily identifiable movement which is usually a rotating movement. All members of this family have a disc which has many teeth, which they use to

"hook" themselves onto a host. Under the microscope they have an appearance that may remind one of a space ship, when observed from above, & if they are seen sideways on, this apparent resemblance to such exotic transport, is heightened as they are bell shaped when observed.

The parasites most frequently attack the gills of the infected fish, which causes in heavy infestations, great difficulty in breathing, so that they come to the surface in a desperate attempt to get sufficient oxygen.

Typical signs of infection. *Trichodina* & 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.

Behaviour . Fish will evidence lethargy, and scratching of the fish against any suitable object in an attempt to get rid of the organisms. Breathing at the surface, or just stationary "hanging" at the surface will be observed.

Fins . Fins often become clamped or folded.

Body . Typically the body will manifest darker colours than normal.

Gills . Gill examination will show large numbers of the organisms , & an excess of mucus may be produced by the gills in response to the invasion by the parasites.

Skin. (smear). Should show ciliates once an infection has become established. A pale bluish slime is often noticed which covers the skin, this is typically blotchy in nature. Mucus is secreted copiously as a reaction to the parasites. Ulcers may be seen on the skin, where necrosis by the parasite has taken place.

Life cycle . This takes place by simple mitotic division, & can result in uncontrolled situations in a rapidly expanding population which increases exponentially.

Prognosis :- In mild infestations of Trichodoniiasis, a cure is almost always possible, & the Hobbyist should if any thing untoward is observed try to make a certain diagnosis following approved methodology, and if the parasite is confirmed then remedial treatment as indicated below should be implemented without delay.

In cases, were severe multiplication of the parasite has already caused heavy invasion of the gills, especially, but also perhaps of the skin, which then invites secondary bacterial & fungal infections to gain a hold, then casualties are to be expected. This however is one disease, that good husbandry & timely action can be expected to overcome without too much in the way of losses.

Treatment . There are several possible cures. As these are quite different in their chemical formulation, one should pay particular attention to the species to be treated, as different fish have totally differing tolerances to the chemicals involved.

I will list some of the most popular methods, along with a few cautions, but as so many Hobbyists have a considerable number of assorted families of fish, in a typical Aquarium, it is vital to pay careful attention, by reading suitable literature, as to the sensitivity of the species you keep to the various potential cures. Failure to do this, (it happens very frequently), will ensure that some fish will die not so much from the illness as from the cure. This no doubt is one more example of the old adage, that the cure was worse than the disease.

Chemicals that can be used to eliminate Trichodoniiasis.

1) **Malachite green** (Zinc free) . Dosage rate is between 0.2-0.25 ppm . Some references give double this figure. **Pros** . Malachite green whilst very effective as a treatment. **Cons** . Is badly tolerated by many of the Tetras, and especially so, by scale-less fish such as Elephant noses & Clown loaches.

Ensure that you are aware of this factor before selecting Malachite as a remedy. Heavy aeration should be given whilst treating, a repeat dose may be used after about 3 days, if required. Malachite green breaks down more quickly in tanks with a heavy organic load, than those that are above average in cleanliness, so again pay heed to these factors when choosing it.

2) **Salt baths** . Fish may be bathed in a 1% solution for about 30 minutes, this repeated for a couple of days. **Pros** . Effective, inexpensive, generally not harmful to the fish. Easily applied but watch if using it, so no unexpected disasters ensue. **Cons** . Certain fish, among them members of the Carp family have very limited tolerance to salt, and can succumb to it. Also possibly some varieties of Trichodoniiasis, either develop an immunity to the treatment, or possibly the some species are the parasite are Euryhaline (will tolerate varying salinities), and thus are not affected by the treatment.

3) **Formalin** (37%-40% commercial formaldehyde). Dosages 250 ppm for about an hour, or 100 ppm for 3 hours. Long term baths may be used at dosages of between 15-20 ppm. **Pros** . In many cases can be totally effective with only one treatment. **Cons** . The many diverse species of fish tolerate Formalin in varying degree. It is vital to pay close attention to the literature BEFORE using this method, relate the species in your tank to the body of knowledge which is considerable. If the literature favours the varieties you are keeping, then this could be the drug of choice, but be aware not all families of fish tolerate it so well.

4) **Acriflavin** Use at 50 ppm as a bath for about 2-4 days. In heavily planted Aquaria, one should treat if possible in a separate treatment tank, to avoid damage to the plants. **Pros** . An effective treatment that is also effective against other possible infections that may be opportunistically awaiting their chance to become parasitic, also Acriflavin is useful against many of the gram-negative bacteria that are so often the result of an infection. **Cons** . The treatment dosage with this drug, is greatly influenced by the pH of the water. The higher pH' s (7.8 & above), have a potentiating effect on the working of the drug, that can impact adversely upon the fish, if this factor is not allowed for. If you choose an Acriflavin type formula, ensure that you check the pH before using, then proceed accordingly.

There are a few other remedies such a Methylene blue, which work also very well, but have the problem in most modern Aquariums of staining the mastick that binds the glass with its colour, there is no way to remove this afterwards. Quinine drugs have also been used, but I prefer to avoid these in almost all cases.

Trichodoniiasis , can best be avoided by observing with great care any fish you purchase in an Aquarium store , before handing over your hard earned cash. Most infected fish, will show some of the signs indicated above. Lightly affected ones, will respond to a quick one day treatment as a prophylactic measure, of your choice as indicated above, so if this regimen is adhered to, then you should never be troubled by this parasite.

Salt water parasite *Uronema marinum* .

This parasite is the salt water variant of the fresh water species known as Tetrahymena. It is a free living ciliate species, that is quite often a "visitor" to marine Aquariums that can if unchecked cause quite severe losses. As an interesting aside, a colleague working with Tuna fish culture in Australia, has found this parasite to be her greatest problem, but so far no major report of serious outbreak in the Aquarium marine hobby has been notified, although a few minor cases are recorded.

In Aquaculture as I have just indicated, there have been some major outbreaks, so a Hobbyist should therefore always be aware that such is a possibility.

It affects several varieties of popular Marine Aquarium fish, among them are Tangs, especially the Yellow Tang, *Pomacanthid* species, Seahorses, as well as some *Centropyge* s, many species of Butterfly's, yellow headed Jawfish among others.

Life cycle . This takes place by simple mitotic division, but there seems to be quite a body of evidence that in marine Aquariums at least, that high organic loads appear to favour the reproduction of the ciliate.

Typical signs of infection. *Uronema marina* .

Water . Less than optimum water quality, especially high loads of organic matter, which may show up in excessive Nitrate and/or Phosphate measurements, as well as an undesirable BOD measurement.

Behaviour . Fish will evidence agitation in the early stages of an infestation. Rubbing and scratching are to be expected as the fish tries to dislodge the irritation. As the disease progresses, extreme lethargy ensues. Eventually the fish will rise to the surface, hanging there, in an attempt to get air, as its gills become more and more parasitized . Heavy breathing may be observed at this stage. The fish may try hiding away from other fish and observers.

Body . In the early stage, a certain fading of the natural colour of the body colour will manifest itself. This will appear as a kind of fading of the colours. As the disease progresses, evident necrotic erosion of the body becomes evident, & haemorrhagic lesions will become apparent.

Eyes . In medium to advanced stages of an outbreak, the eyes typically become clouded, & when very heavy blindness can ensue.

Gills . Gill examination will show large numbers of the organisms .

Skin . (smear). Should show ciliates once an infection has become established. Secondary infection with fungal is commonplace once major invasion of the skin has taken place, adding to the problem. Excessive slime will be noticeable on the skin.

Histo-Pathology . Smears taken from the gills as well as the skin, usually show many hundreds of the ciliates which are about 40 x 20 microns in size. Evidence of infection can also be expected by examination of the ureter, as well as the kidney. As mentioned earlier evidence has now arisen of infestation penetrating the brain as well.

Prognosis: - Outlook is extremely variable. Heavy infestations usually cause such necrotic damage that mortality ensues, probably by secondary infections. The references to treatment in the literature are sparse, so I will relate from my own experience, as well as the excellent short book by Gerald Bassler (in German), as little else is available. I believe it is possible with scrupulous attention to the details to "defeat" this scourge, which can literally destroy an Aquarist's prize specimens rather quickly if not controlled.

Treatment . The preferred treatment which has worked for me, and is also referred to among others by Bassler, is to use prolonged fresh water baths. These should extend from 15-30 minutes & must be repeated for several days to ensure a good result. The fresh water MUST be the same temperature, pH etc as the water in the Aquarium, to avoid extra unnecessary stress, and under no account should the Hobbyist, try to do any other task during this time. No telephone calls etc. The fish must be closely observed for undue stress (most fish will keel over) but will not be too greatly stressed if the points mentioned are adhered to. However if the fish is in an advanced stage of infection then this method will certainly kill the fish, not only from the stress, but also because if there is already major necrotic damage, then the change in osmotic pressure that will kill the parasite, can cause the fish's body fluids to "osmose" out to the water of the container, & the result will be its demise. The treatment works well in early cases, especially to prevent fish that have been exposed to the infestation becoming badly infected.

The Aquarium must be "cleaned" of all excessive detrital material as there a correlation between the amount of such and the proliferation of parasite. If possible infected fish should be placed in another Aquarium until recovery appears to be under way. The parasite seems to be unable to tolerate the change in osmotic pressure, and simply stated it bursts, if one is able to keep following through. The problem can be that some species of fish, as well as variation among individual specimens, also occasionally will cause such distress as to harm the fish. This is mostly avoided by keeping a close eye on things.

Bassleer, also recommends using Malachite green or a combination of Malachite and Formalin. Logically this should work, as it does on may other related ciliates. However he states no dosage, so considerable caution should be used, if choosing this regimen, as no other commentator has referred to it. He also mentions the use Methylene blue, and especially mentions a combination of Chloramphenicol with Nifurpirinol. Again for these no dosages are given, but probably he has found they work, as one would expect them to be efficacious against secondary infections, which so often are the ultimate cause of death.

As most of the likely species to be infected in the Hobbyists tank, are among those that are expensive, it is most useful to have some knowledge of what to look for, in this parasite, as I have often saved almost all my fish by discovering it early, when treatment has the greatest potential for success. I have unfortunately witnessed all to many cases, where the outcome was an almost total loss.

Before finishing I want to take up a matter that whilst not strictly a disease, is one that causes many losses in Marine Aquariums. The subject is *Cyanobacteria*, aka Red Algae.

I get many calls about it as we have asking for a product to get rid of this. However I have for a few years been investigating the underlying reasons for this phenomena so would invite those Hobbyists who have this problem and would care to cooperate in some research to contact me.

There are several references in the literature to the alleged fact that *Cyanobacteria* are supposed to thrive when the Phosphate levels are excessive. Many times Hobbyists have contacted me to say, that they are plagued by "Red Algae", but that their Phosphate levels are either zero, or almost so.

I began a few years ago to make some preliminary investigations, as I had a suspicion that perhaps the cause was not PO_4 , (inorganic Phosphate), but in fact PO_3 (orthophosphate or organic). At that time, some Hobbyists were kind enough to send me samples of their water ... in every case I tested the water and it showed as they said almost no PO_4 , but substantial PO_3 values.

So if any of you out there, have any ideas on how the PO_3 becomes transformed in the biological interactions that take place in an Aquarium, I would like to have your ideas, as well as any references in the literature, as I have been unable to find any. This would be important in trying to find some methods of prevention, rather than cure. As the several Phosphate "sponges" or similar on the market, only remove PO_4 , such would be a most

John Shawn Prescott john@aquarium-gardening.com

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