

Special considerations for treatment of ornamental fish

Fish which are not intended for human consumption can also be treated with the chemicals described above for food fish. Copper sulfate or potassium permanganate work well in pools, whereas, formalin or salt may be easier to use in smaller volumes of water.

Malachite green is another chemical which can be used to treat ornamental fish that are housed indoors. This chemical should **NEVER** be used to treat food fish. Not only is this illegal and unethical, but it is totally unnecessary. The chemicals listed above (copper sulfate, potassium permanganate, formalin, and salt) are all excellent treatments for "Ich". Malachite green is mentioned for the sake of completion, but is not recommended by the authors. The chemical is hazardous to handle - it is known to cause cancer, mutations, and is harmful to fetuses. Gloves and a protective mask should always be worn when handling the concentrated powder. Pregnant personnel should **NEVER** handle this chemical. Despite its toxicity, it is commonly used to control parasitic protozoans on ornamental fish and is quite effective when used at concentrations of 0.05 to 0.10 mg/L as an indefinite bath. This chemical is extremely harsh on fish, particularly on gill tissue, so be careful not to overdose the fish. Malachite green can also be combined with formalin (0.2 mg/L malachite green mixed with 25 mg/L formalin) to treat external protozoan diseases. The two chemicals work well together and are quite effective. Malachite green can be very toxic to scaleless fish and should be avoided on these species.

Special considerations for treatment of pet fish

Pet fish can be treated with any of the chemicals discussed above to correct "Ich" infections. A number of commercial preparations are available from pet stores which contain one or several of these agents. Temperature manipulation is also an effective way to control "Ich" in home aquariums. This technique is often not practical for commercial fish farms, but is advantageous for the hobbyist because expensive products do not have to be purchased and it is safer for some of the delicate species which are popular in community tanks. Water temperature can be gradually raised to 90°F, maintained there for 24 hours, and then gradually

dropped to 70°F for 48 hours. The infective juveniles (tomites) will be killed while the water temperature is at 90°. When the temperature is dropped the adult organisms will fall off the fish and begin to reproduce. As the young begin to emerge 48 hours later, the temperature is again raised to 90° F, causing them to die. Repeating this process continuously (24 hours at 90° F followed by 48 hours at 70° F) for two weeks should control the disease. Cleaning the tank every second day will help remove cysts before they rupture and therefore help to prevent completion of the life cycle. If you decide to use temperature to control "Ich" in your home aquarium be sure that the type of fish in your tank can tolerate the temperature extremes involved.

Summary

"Ich" is a protozoan parasite with the scientific name of *Ichthyophthirius multifiliis*. It is easily introduced into a fish pond, tank, or home aquarium by new fish or equipment which has been moved from one fish-holding unit to another. Quarantine is an effective way of preventing this disease. Once the organism gets into a large fish culture facility, it is difficult to control due to its fast reproductive cycle and its unique life stages. If not controlled, 100% mortality of fish can be expected. With careful treatment, the disease can be controlled, but the cost will be high, both in terms of lost fish, labor, and the cost of chemicals.

In contrast to most parasitic diseases, where the decision to treat (or not to treat) is based on the degree of infestation and other factors, fish infected with "Ich" (even if only one parasite is seen) should always be treated immediately. This organism can only survive if live fish are present for completion of its life cycle. It can cause massive mortality of fish within a short time. In severe cases, control may be impossible. A single treatment is not sufficient for this disease, as the encysted stage is resistant to chemicals. Repeating the selected treatment will disrupt the life cycle and control the outbreak. Daily cleaning of the tank is also beneficial, as the encysted forms are physically removed from the environment. *Ichthyophthirius multifiliis* is a common parasite which can cause catastrophic loss in aquaculture facilities. Careful attention to management practices, such as quarantine and multiple treatments when outbreaks occur, will minimize economic loss from this disease.

