



Bath Treatment for Sick Fish¹

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Administration of medicine to sick fish can be difficult. A popular means of medicating fish is to place a chemical ("medicine") into the water with the fish. This method of delivering a medication is called a **Bath Treatment**. Bath treatments are effective for treating certain diseases, particularly parasitic infestations on the skin or gills. This method is much less desirable for treating internal infections of fish. Any time a bath treatment is utilized, attention must be paid to the **Concentration** of the chemical applied and the **Duration** of exposure to that chemical.

Types of Bath Treatments

There are three basic types of bath treatments: dips (less than 1 minute), short-term baths (about 1 hour), and prolonged baths (indefinite). The difference between these bath treatments is the concentration of the chemical applied and the period of time that the fish are in contact with the chemical.

A Dip is just what the name implies. The fish is dipped into a concentrated chemical bath for a short period of time, often less than one minute. Prolonged exposure to the chemical at the high concentration delivered in a dip would be fatal to the fish. Because fatalities can easily result from an improperly administered dip treatment, and because sick fish are generally intolerant of stressful situations, dip treatments are often avoided by many aquarists. An exception to this may be the use of salt water dips when moving fresh water fish, and the use of fresh

water dips when moving salt water fish. These techniques are discussed in a separate IFAS Fact Sheet, *Use of Salt to Treat Fish Diseases*.

A Short-Term Bath means that the fish are subjected to a moderate chemical concentration for a period of time ranging from 30 minutes to several hours. This is an excellent method for administering many medications to fish kept in aquaria, tanks, or raceways. The duration of exposure to the chemical will be determined by the chemical used, the concentration of chemical used, and the facility in which the fish are housed. In most cases, water flow and filtration are shut down while the chemical is in contact with the fish. This prevents rapid dilution of the chemical by in-flowing water and also prevents the chemical from coming in contact with bacteria in the biofilter. If the water flow and circulation is shut down during the treatment, water quality should be monitored to prevent harmful increases in ammonia concentration. Vigorous aeration should always be maintained during treatment.

A Prolonged Bath means that small concentrations of chemical are applied and left in the water on a permanent basis, where it will eventually break down and disappear. This is the only method of administering a bath treatment to pond fish. Because of the low concentrations of chemical applied, a prolonged bath is often the least expensive and safest way of administering a chemical bath. A prolonged bath is not recommended, however, when fish are crowded in a relatively small area such as a tank or vat. Shutting off water flow or filtration for an

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extended period of time (more than 2-4 hours) under tank conditions is likely to result in serious degradation of water quality which could further stress, or kill directly, the fish.

When to Use Bath Treatments

The aim of most successful bath treatments is to eliminate external infections. External infections occur on the gills, skin, and fins of fish. They can be of parasitic, bacterial or fungal origin. In contrast, use of bath treatments to treat internal infections, particularly systemic bacterial disease, is not generally recommended. Medicated feeds are preferred for treating internal problems. However, if fish are not eating then a bath treatment may be the only method available to administer medication.

The chemicals which are most commonly used for bath treatments are potassium permanganate, formalin, copper sulfate, and salt. Each of these chemicals is discussed in greater detail in a separate IFAS Extension Fact Sheet. Concentrations which can be used to administer a dip, short-term bath, or prolonged bath for each of these chemicals is shown in Table 1. Keep in mind that these are general guidelines for dosage and your fish may require a lower concentration or shorter period of exposure. Exceeding the concentration or duration of exposure shown in Table 1 is not recommended. Methods for calculating chemical treatments are provided in a separate IFAS Extension Circular.

How to Add Chemicals to the Bath Treatment

Before applying chemicals double check the chemical you are using, the concentration to be delivered, and ideally, two people should independently calculate the amount of chemical to be added. Proper calculation of concentration is contingent upon accurate determination of volume of water to be treated. If you are uncertain as to the volume of water to be treated take the time to measure the size of the pond or container so that volume can be accurately determined.

Addition of chemicals to water containing fish must be done carefully so that all the chemical is mixed uniformly throughout the water column. If the chemical is not thoroughly mixed, "hot spots" (areas of high concentration of chemical) may be formed which can damage, or kill, fish. To ensure uniform application, dry chemicals can be dissolved in water prior to, or during,

application. In some ponds, aerators can be used to help distribute chemicals throughout the water column. Personnel handling chemicals should be encouraged to wear protective clothing.

Sick fish are often weak and may not tolerate chemicals at the concentrations recommended. Never leave fish unattended during treatment. Nets and other equipment used to handle sick fish must be sanitized before being used again.

When to Terminate a Bath Treatment

No chemical used in aquaculture is completely harmless to fish. Treatments are designed to be more harmful to the problematic organism (ie. bacteria, protozoan) than to the host organism (ie. fish) which results in successful elimination of the pathogen with minimum damage to the fish. For some chemicals, particularly copper sulfate, the difference in chemical concentration which is lethal to the pathogen and that which is lethal to the fish is small. If fish show any signs of distress during the treatment (ie. trying to leave the water, gasping at the surface) the treatment should be terminated immediately and fish placed in clean water.

If fish are in a pond and have been treated with a low concentration of chemical (prolonged bath) there is nothing that can be done to remove the chemical if it has been improperly applied. Again, one way to help avoid losing a pond of fish by accidentally applying too much chemical is to have the amount of chemical to be applied calculated independently by two people. Volumes of ponds should be known and the amount of chemical needed to treat each individual pond should be calculated and recorded for easy reference. Errors are best avoided by preparing for a disease situation before it happens, rather than frantically calculating treatment rates and locating chemical suppliers when a disease is in progress.

Summary

Bath treatments, in which a chemical is added to water containing sick fish, can be applied as dips (less than 1 minute), short-term baths (about 1 hour), or prolonged baths (indefinite). The concentration of chemical used will vary with the period of time fish are to be treated. Short-term baths work well for fish housed in aquariums, tanks, or raceways, while prolonged baths are required for fish housed in ponds. Bath treatments are most effective against external infections and are not generally recommended to treat internal infections. The

chemicals which are most effective for treatment of external infections of fish, and which can be safely administered in a bath treatment, are potassium permanganate, formalin, copper sulfate, and salt (Table 1). Correct application of a bath treatment requires that the

volume of water to be treated is accurately known, and the amount of chemical to be used should be independently calculated by two people. A bath treatment should be terminated immediately if fish show any sign of distress during the treatment period.

Table 1. Summary of approved¹ chemicals which can be applied as dips, short-term baths, or prolonged baths.

Chemical	Approved Species	Approved Use	Efficacy	Concentration/Duration		
				Dip	Short-Term Bath	Prolonged Bath
Copper Sulfate	None Specified	Algicide	External Parasites	500 mg/L	4 ml/L	Total Alkalinity divided by100%
Formalin ²	Trout Salmon Catfish Largemouth Bass Bluegill	Parasiticide	External Parasites	400 mg/L	250 mg/L 30-60min.	15-25 mg/L
Potassium Permanganate	None Specified	Oxidizer Detoxifier	External Bacteria Fungus Parasites	1000 mg/L	20 mg/L 1 hour	2mg/L
Salt	None Specified	Osmoregulatory Enhancer	External Parasites	3% (30,000 mg/L) 1 min	1% (10,000 mg/L) 1 hour	.02% (200mg/L)
1. Schnick, R.A., Meyer, F.P., Gray, D.L., 1989. A Guide to Approved Chemicals in Fish Production and Fishery Resource Management. University of Arkansas Cooperative Extension Service. Little Rock, AR 27pp. 2. Approved products are: Formalin - F (Natchez Animal Supply Company, Natchez, MS) Paracide - F (Argent Chemical Laboratories, Redmond, WA)						