

Bifuran™

Aquarium Fish Medication

PURPOSE AND BENEFITS

Bifuran™ is a combination of two powerful nitrofurantoin antimicrobials, nitrofurazone and furazolidone. The combination has demonstrated its usefulness in treating a wide range of external bacterial and protozoan diseases of aquarium fishes, while showing very low toxicity to the fishes being treated. It is the medication of choice when treating external diseases of aquarium fishes that are showing non-fungal but otherwise poorly characterized signs of disease. **Bifuran™** is not effective against diseases caused by fungus. Additionally, **Bifuran™** is not the medication of choice against ich. For ich and fungal diseases of aquarium fishes **Ich-X™** is recommended.

HIKARI'S FAMILY OF TREATMENTS AND WATER CONDITIONERS

Bifuran™ is one of a growing family of scientifically formulated and clinically tested aquarium and pond disease treatments. Throughout this document, directions will be given where other members of this family of products can be used to complement it in the job of disease treatment and prevention.

The treatment of bacterial and protozoal diseases of fishes will often require a reevaluation of, and alteration of, the initial treatment plan. This possibility is addressed in this document and aquarists and pondkeepers are advised to be open and ready to make a change in treatment, but to continue an effective treatment to its conclusion. This means that if a treatment is obviously not working, after an appropriate period (we use what we call the "three day rule"), that one must be ready to make a water change, reevaluate and start on a different course. Of course, this means that all aspects of the treatment (e.g. feeding (as appropriate), water changes, isolation, and removal of chemical filtration) must be followed. Failure to observe the complete treatment regime will usually result in failure. Other products in the Hikari family of treatments will be brought to market to fill the gaps that cannot be filled by **Bifuran™**. Hikari has a commitment to excellence and will always provide and recommend the best products and advice available.

CLINICAL SIGNS AND THE TREATMENT OF DISEASES OF AQUARIUM FISHES

The following information is given as a guideline only, and reliable fish disease references must be consulted for more complete and detailed information. Read all of the following information for a more complete picture of proper disease control and prevention.

GENERAL CONSIDERATIONS: Remove all chemical filtration from the treatment tank before adding the **Bifuran™**. As directed below, always start the treatment with as large water change as possible and condition the water with **ULTIMATE®** (or **Liquid Buffered ClorAm-X®** and **Stress-X®**). Water changes are always appropriate prior to starting any treatment, and they should be performed daily if treatment cannot be started immediately. Removal of diseased fishes to a separate quarantine/treatment (Q/T) tank is highly recommended. If a Q/T tank is used it is important to improve the aquatic environment in the original aquarium, too.

It is extremely important to make an early and accurate diagnosis. If in doubt of your diagnosis seek the advice of a respected fish disease professional or e-mail Hikari for assistance (remember, long-distance fish disease diagnosis is extremely difficult). Valuable assistance can be obtained on CompuServe's Aquaria/Fish Forum, FISHNET.

DISEASES CAUSED BY FUNGI (SAPROLEGNIASIS): Saprolegniasis is often the easiest fish disease to properly diagnose. In most cases it is likely to be observed in fishes as areas of necrotic (dead) tissue that are covered with whitish, hairy, or "cottony" patches. Such fungal disease are almost always secondary infections caused by stress or injury. Treating the aquarium, as directed, with **Bifuran™** should only be in addition to directly swabbing the visible fungal patches with **Ich-X™**. Swabbing must be done with a clean, cotton swab, and the swab must never be dipped more than once into the container of **Ich-X™**. Be sure to have plenty of clean, dry swabs ready to use.

UNDIFFERENTIATED EXTERNAL DISEASES: External diseases that appear in a population of aquarium fishes and which are otherwise unidentified by visual inspection are likely caused by pathogenic bacteria, but may have a contribution from other microorganisms. **Bifuran™** is suitable for use in such disease conditions. Where only one or two fishes in a given tank are showing such signs and where identifiable lesions or wounds are visible, then **Bio-Bandage®** should be used and the affected fishes isolated if possible.

THE "THREE DAY RULE": As with the majority of aquarium disease treatments, **Bifuran™** should be treated daily for three days. Prior to each treatment as large a water change as possible, with **ULTIMATE®** (or **Liquid Buffered ClorAm-X®** and **Stress-X®**) used to condition the new water, should be made. After three such treatments, the course of the disease must be evaluated. If the diseased fishes are showing signs of improvement or, at the very least, they are not getting any worse, then the treatments should be continued for at least 1 day beyond the disappearance of all signs of the disease.

BACTERIAL FIN & TAIL ROT (PSEUDOMONIASIS): The bacterial species *Pseudomonas fluorescens* is ubiquitous among populations of both freshwater and saltwater aquarium fishes. Its early appearance is as greyish or whitish fringes on the trailing edges of the fins. This can be accompanied by "fin congestion" in which the blood capillaries of the fins have ruptured and blood invades the transparent tissues of the fins. In this early stage of the disease large water changes and treatment with **Bifuran™** will be most effective. Failure to properly diagnose and treat the disease at this early stage will usually lead to the disease becoming systemic and the internal organs of the infected fishes will become diseased.

In advanced stages of this disease the infected fishes may show cutaneous ulcerations where the skin and/or scales are missing and large reddish lesions, often with whitish edges, are evident on the body. **Bifuran™** can be used to help control these signs of the disease, but it must be understood that once the disease has reached this stage it may have become systemic, and that successful treatment may not be possible.

COLUMNARIS DISEASE (PEDUNCLE DISEASE, SADDLEBACK, FIN ROT, COTTON WOOL DISEASE): *Flexibacter columnaris* is another bacterial disease that exists worldwide and is known to infect most freshwater aquarium fishes. Its usual signs are necrotic lesions on the skin or gills. These lesions can occur around the caudal peduncle or extend across the back of the infected fishes. These lesions usually occur as white areas (plaques), often with reddish borders. The lesions will quickly become ulcers, often with yellowish coloration due to the bacteria concentrated at the site of the active infection. The ulcers quickly grow and invade the underlying muscle tissue. If a viable treatment and improvement of the environment is not accomplished quickly the infection will become systemic and often result in numerous fish deaths. This disease is highly contagious. Treatment with **Bifuran™** at the first signs of the disease, as

recommended above, will typically result in a cure. However, one must observe the "three day rule" and be ready to cease the **Bifuran™** treatment and consider alternative treatments if the first treatment is not effective.

FURUNCULOSIS (ULCER DISEASE): This bacterial disease of freshwater fishes causes skin ulcers that may appear as white patches to lesions with red hemorrhaging that are often so deep that the underlying muscle or bone is exposed. Typical of all disease, early and accurate diagnosis and use of a proper treatment regime are necessary to achieve a cure. This disease is contagious, and isolation of diseased fishes and quick removal of all dead and moribund fishes (to prevent the other fishes from feeding on them) will help prevent its transmission. Additionally, as with all of the bacterial diseases of aquarium fishes, proper environmental control is necessary. This disease will become systemic in its later stages, and the use of **Bifuran™** at the earliest possible stages will give the best results, but as usual, the "three day rule" must be followed.

VIBRIOSIS (DAMSELFISH ULCER DISEASE, ULCER DISEASE & RED SORE DISEASE): This is a disease of marine tropical fishes caused by *Vibrio damsela*. It manifests as ulcers of the skin, often restricted to the base pectoral fins and caudal peduncle. The successful use of **Bifuran™** by professional marine fish dealers suggest that this disease and other bacterial diseases of marine aquarium fishes respond well to its use. Always follow good environmental control with good dissolved organic removal (e.g. chemical filtration with granular activated carbon and/or foam fractionation ("protein skimming")). Always follow the "three day rule".

SPECIFICATIONS

DOSAGE: **Bifuran™** is dosed at a rate of one teaspoonful (≈5 mL) per 10 gallons of water. This produces a nominal concentration of 25 mg/L of the active ingredients.

CONTRAINDICATIONS

Bifuran™, like all antibacterial treatments, must be dosed at the proper concentration. Overdosing by as much as 25% may cause toxic reactions to some fishes. Always watch for signs of stress in treated fishes and invertebrates and be ready to perform a large water change and restart chemical filtration to remove the treatment from the water. Unless recommended by another authoritative source, do not use **Bifuran™** at greater than the labeled dosage.

Bifuran™ is not for human or veterinary medical use. It is not for use on food or game fishes. It is not for use in open water ways, rivers, streams, canals, irrigation ditches, lakes, recreational ponds, nor in aquarium or pond systems which empty directly into any such waters.

Do not use **Bifuran™** with any other drugs or treatments (this includes salt treatment).

STABILITY

Bifuran™ is stable for an indefinite period if kept dry in its original container and stored away from heat and cold. When not in use store tightly closed, at room temperature (above 60°F and below 100°F), and out of direct sunlight. Do not return unused portions to the original container.

CAUTIONARY STATEMENTS

WARNING: **Bifuran™** contains nitrofurans that are suspected carcinogens and teratogens. Do not get in eyes or on skin. If dust or powder gets into eyes wash for at least 15 minutes with clean running water. For skin contact wash thoroughly with soap and warm water. Remove and wash all contaminated clothing. Keep away from food and feed.

If swallowed immediately contact a physician.

CALIFORNIA WARNING: **Bifuran™** may contain ingredients known to the State of California to be potential or actual carcinogens (cancer causing) or teratogens (birth defects causing).

PACKAGING

Bifuran™ is packaged in convenient 5.5 oz. (156 g) that treats 250 gallons. All containers are fitted with child-resistant (CR) closures (caps) with internal seals.

CONTACTING US

For questions or comments:

Hikari Sales USA, Inc.
2230 Davis Court
Hayward, CA 94545
(800) 621-5619
e-mail: fish@hikariusa.com
web site: www.hikariusa.com

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SUGGESTED READING

Stoskopf, Michael K. 1993. *Fish Medicine*, W.B. Saunders Company, Philadelphia, PA, xix + 600 pages.

This reference is written primarily for fish disease professionals and veterinarians. However, most serious aquarists and pondkeepers will find it quite informative and useful from a practical standpoint.