

## Popular Article

### Common Fish Diseases: Control and Treatment



Tail Rot, Fin Rot and Ulcers



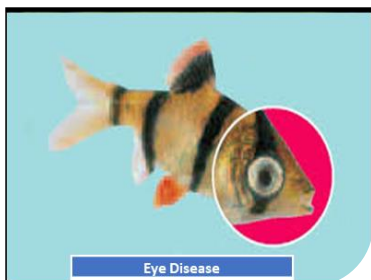
Gill Infections



Ichthyophthiriasis (Ich Disease)



Argulosis



Eye Disease

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#### Abstract

In the present world, various food producing sectors are gaining more importance to sustain the nutritional and food security of the world. Fish production sector is emerging as key sector to achieve the food security goals of the country and the world. Continuous focus on higher production targets has left the aquaculture highly susceptible to frequent disease outbreaks and consequent economic losses. It has been estimated that per annum economic loss due to aquatic animal diseases is approximately US\$ 6 billion, worldwide. Though prophylactic measures such as maintenance of optimum culture conditions, probiotics and immunostimulants are regularly used in aquaculture, the application of medicated feed containing antibiotics often becomes the method of choice for the treatment of disease outbreaks. As is understood, prevention of fish diseases assumes paramount importance in terms of sustainable growth of aquaculture.

#### Introduction

Aquaculture is playing an increasingly important role to meet the growing food demand for human consumption. With increasing anthropogenic activities, large numbers of hazardous materials of biological and non-biological origins are frequently introduced in aquatic environment. Fish are exposed from different environmental pollutants, including drugs and chemicals and similar to other animals, they can also suffer from various types of diseases. The fish can also be infected or damaged by different pathogens, microorganisms or parasites. The most common fish diseases are gill disease, ich, tail and fin-rot, fungal infections, black spot disease, pop-eye, cloudy eye, fish lice and worms' infestation.

#### Causes of Fish Diseases:

There are three major causes of fish diseases:

1. Presence of environmental pathogens.
2. Low resistance of the fish stock.
3. Unsatisfactory water environment and poor management practices.

Pathogens (e.g. bacteria, viruses, fungi and parasites) exist in all natural water bodies, yet healthy fish have adequate resistance against them. They can also adapt to reasonable environmental changes and in turn avoid diseases due to pathogenic infection. Poor management practices may result in drastic changes in water quality and increased pathogen load in the aquatic environment. Under these conditions, already stressed fish may become vulnerable to pathogenic infections and diseases.

#### Impact of Fish Diseases:

Diseases affect the survival and growth rates of fish under culture. Given that drug treatments are expensive, fish diseases invariably lead to lower harvest and higher cost. Fish farmers often suffer hefty economic losses due to fish diseases. To alleviate such losses, it is crucial to take precautions to prevent fish diseases and reduce pathogen levels in water bodies. It is also important to prevent water quality from deteriorating and to strengthen the natural resistance of the fish stock. Regular monitoring of fish health is an effective way to identify disease uses and appropriate treatments. One major cause of serious fish kill is overlooking the contagiousness of fish diseases and thus delaying treatment. As such, adequate care and treatment should be given to infected fish promptly.

## Monitoring of Fish Stock:

Fish farmers should carry out a simple inspection, every day. This routine can be divided into two stages:

### Stage 1

Observe the fish for any uncharacteristic behavior, such as:

- Reduced feed intake. It is the first sign of many fish diseases. For this purpose, the farmer should maintain a daily record of feed intake so that any abnormality can be found out.
- Abnormal swimming pattern. Fish lying flat, rubbing against the bottom, jumping out of the water, circling in water, losing buoyancy/balance or congregating near the pond surface/dykes.

If any abnormal behavior is reported, proceed to Stage 2.

### Stage 2

Check the body surface, fins and gills for presence of:

- Parasites
- Red spots, hemorrhage, loss of scales and ulcers
- Discoloration or dark body tones
- Tumor or fluid build-up in the body muscles (oedema)
- Tail rot or fin rot.
- Protruding or white/cloudy eye.
- Deep red spot, whitish colour, parasites or excess mucous in gills.

If any of the above symptoms are found, immediately separate the diseased fish from rest of stock and contact the experts for proper advice and control measures.

## Symptoms and Control of Common Fish Diseases:

### 1. Cotton Wool Disease:

This is a fungal disease of fishes and fish eggs most commonly caused by *Saprolegnia* spp. These types of fungi are almost always present in farms and can cause the diseases due poor management practices. Malnutrition, presence of toxic substances in water, damages on skin, fins or gill and stress can lead to the secondary invasion of fish tissue by this parasite. Symptoms of this disease are presence of brown cottony growth on the fish wounds or eggs. The diseased fish behaves abnormally, fidgeting and rubbing against solid materials. As the mold continues to grow, morbid muscle rots and the fish loses its appetite, moves slowly, and eventually dies.

Disinfection of diseased fishes and fish eggs by following methods should be followed for control of this disease:

- Malachite green bath for fishes at 5 mg/L for one hour.
- Disinfect viscid eggs by immersing them with a 2-5 ppm malachite green solution for 10–15 min
- Prevention by following the BMPs is the best strategy. Maintaining optimal water quality, nutrition and stocking density is recommended to reduce fish stress and injury
- Bath treatments in NaCl (10–25 g/l for 5–30 min) or KMnO<sub>4</sub> (5 mg/l for 10 min), are only partially effective

### 2. Gill Infections:

Fishes may also become susceptible to severe types of gill infections. These infections can either be caused by fungi (*Branchiomyces* spp.) or by bacteria (*Flavobacterium branchiophilum*) and called as gill rot or bacterial gill disease, respectively. The affected fishes become lethargic with loss of appetite. They can also be seen gasping for air at water surface and show poor response to external stimuli. Discoloration and necrosis of gill tissues are common signs of this disease. Microscopic examination of tissues is helpful to establish the gill rot due to fungi.

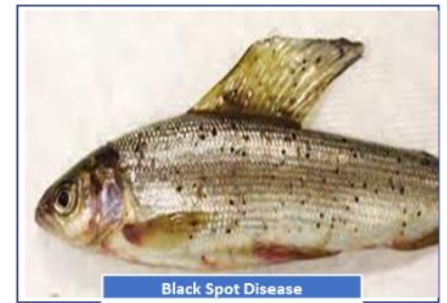
- Bath treatment for infected fish in 3-5% salt solution or with 5ppm potassium permanganate for 10 minutes
- Diseased fish can be treated with malachite green at 0.1ppm for 1 hr
- Ponds with regular branchiomycosis outbreaks should be dried and treated with lime at 150–200 kg/hectare.
- Prevention is the best control for Branchiomycosis. Recommended BMPs for maintenance of optimum water quality help to reduce fungal growth in an aquaculture.



Cotton Wool Disease



Epizootic Ulcerative Syndrome (EUS)



Black Spot Disease



Gill Fluke and Skin Fluke



Lernaeasis

### 3. Tail Rot, Fin Rot and Ulcers:

These types of infections are most commonly caused by several bacterial species such as *Aeromonas hydrophila*, *Pseudomonas fluorescence* and *Flexibacter columnaris* etc. Diagnosis of these diseases is quite easy. The first signs of the disease are milky white areas appearing in the fish's fins or tail, particularly around the edges. The fins develop a rather ragged appearance as the disease begins to eat the tissue. Eventually the disease eats all the clear fin membrane away, leaving just the fin rays.

Maintenance of water quality is very much important for control of bacterial infections. In addition, following control measures can be applied for treatment of infected fishes:

- Bath treatment for infected fish in 3-5% salt solution for 10-30 minutes.
- Partial water exchange and disinfectant/sanitizer treatment to restore optimum water quality
- Oral feed-based administration of Oxytetracycline @ 70-80 mg/kg fish body weight (BW) for 7-10 days

### 4. Epizootic Ulcerative Syndrome (EUS):

EUS has been reported to be one of the most destructive diseases both for farmed and wild fishes of fresh and brackish water origin. This infection is caused by fungi known as *Aphanomyces invadans*. EUS is also known as red spot disease (RSD), mycotic granulomatosis (MG) and ulcerative mycosis (UM). EUS occurs mostly during periods of low temperatures of 18–22 °C and after periods of heavy rainfall. Once an outbreak of EUS occurs in a region, it generally re-occurs with less severity over the next 2 to 3 years and with a reduced frequency thereafter. EUS causes ugly lesions in affected fish. Lesions can range from small pinpoint red spots, hemorrhagic spots, localized swelling, localized raised areas on the body surface, protruding scales, scale loss, skin erosion, reddened areas of the skin under the scales, exposure of underlying musculature, and ulceration. Lesions are observed most often in the lateral surface but can also occur on any part of the body. However, detailed microbiological and histopathological investigations are required for confirmation of EUS.

There is no effective treatment for EUS-infected fish in the wild and in aquaculture ponds. To minimise fish losses in infected areas, ponds water exchange should be stopped and lime (@ 200kg/hectare) should be applied.

- Follow-up on BMPs and the use of disinfectants such as lime (in line with the pH of the water), KMnO<sub>4</sub> (3–5 kg/ha), and other sanitizers as a preventative measure.
- CIFAX, a drug developed by ICAR-Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar, Odisha, has been demonstrated to be effective against EUS. For a 1 m water depth\*, a dose of 1 l/ha is recommended.

*\*One litre of CIFAX should be mixed with minimum 100 Litres of water for uniform spray over the pond water surface*

### 5. Eye Disease:

Eye disease in fish is common and can be caused due to several reasons. In carps, this disease is commonly caused by a variant of the bacterium, *Aeromonas liquefaciens*. Diseased eyes may appear swollen, enlarged (as in a pop-eyed appearance), bloody, opaque/whitish, ulcerated, or otherwise disfigured. Further progress of the infestation results in putrefaction of total eye tissues and ultimately the affected tissues fall of leaving behind the hollow eye cup.

- Fishes in advanced stage of disease rarely recover. However, application of Potassium Permanganate at 1 mg/l concentration, twice over a period of seven days, has been found effective.
- Oral feed-based administration of Oxytetracycline @ 70-80 mg/kg fish body weight (BW) for 7-10 days.

### 6. Argulosis:

This disease is caused by *Argulus* spp. (also known as fish lice). These can cause significant morbidities and mortalities in fishes during summer season. *Laboeo rohita* is mainly affected by this disease. The lice can be found attached to the skin, gill chamber, and mouth. In heavy infestations, the it may be seen all over the skin and fins of the fish and in the water column. The affected fish shows patches of hemorrhagic, fin and scale loss and increased mucus production. It may become lethargic with erratic swimming behavior. Fish may also rub against surfaces in an attempt to relieve irritation or to remove the parasites.

Following measures can be applied for control of argulosis:

- Segregate the infected fishes from the young healthy ones.
- Bath treatment in KMnO<sub>4</sub> at 10 mg/l for 30 min or with (3 – 5%) NaCl solution for 10-20 mi. During the bath concentration of 10 mg/l, careful observation of fish is mandatory to avoid mortality.

- Argulus breeds on hard surfaces, erecting PVC or bamboo poles in the pond aids in the removal of the eggs.
- Application of Cypermethrin (6 ml/acre) or Deltamethrin (Butox) (15 ml/acre) in the pond.

#### 7. Lernaeasis:

This disease is caused by *Lernaea cyprinacea*. The body of this crustacean is elongated, worm like and its head is embedded in the body of fish. Many branches arise from this embedded head. Due to infestation, initially fish starts swimming rapidly and later on, lesions/wounds develop on the body. Catla fish is mainly affected by this disease. Baths in concentrated solution of salt and potassium permanganate are reported to be effective for control of lernaeasis.

- Segregate the infected fishes from the young healthy ones
- Bath treatment in 30 – 50 g/l (3 – 5%) NaCl solution or 5ppm potassium permanganate for 10-20 min

#### 8. Gill Fluke and Skin Fluke:

These infestations are caused by helminth parasites *Dactylogyrus* spp. (gill fluke) and *Gyrodactylus* spp. (skin fluke). Heavily infected fish show increased production of mucous, frayed fins, skin ulcers and damaged gills. Fish may also gather at water surface and show the typical air gulping behaviour.

For control of these helminth parasites, one of the followings control measures can be tried:

- Bath in 100–250 ppm of formalin ranging from 1 to 3 hours.
- Bath treatment in 3–5% NaCl solution for 10-20 min
- Mebendazole bath treatment @ 100 mg/l for 10 min or 1 mg/l for 24 h.

#### 9. Black Spot Disease:

This disease is caused by helminth parasite *Diplostomum* spp. It leads to development of small black or brown spots on several parts of the body and fins. Eye lens may become opaque leading to blindness in fish.

- Removal of aquatic snails and preventing the entry of birds are some of the preventive measures.
- Fish exhibiting black spots may be given an hour bath in 10 ppm picric acid solution.
- Oral and bath application of Mebendazole has been reported effective in killing metacercaria

#### 10. Ichthyophthiriasis:

The white spot disease or 'ich' is a common parasitic disease that affects a variety of freshwater fishes and caused by the protozoan *Ichthyophthirius multifiliis*. Ich is one of the most common diseases encountered in tropical-fish aquariums. Its signs include the presence of small white spots resembling a sprinkle of salt grains on the body and gills, frequent scraping of the body against objects in the environment and loss of appetite. Affected fish may die from direct tissue damage by the parasite and secondary microbial infections.

- Segregate the infected fishes from the young healthy ones
- Bath treatment in 3–5% NaCl solution for 10-20 min and with formalin 1-2 ml/l for 15 min
- For aquarium fishes, add 1 ml of 1% methylene blue solution in 5 litres of aquarium water

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