The Fish World a Monthly Magazine
August 2024 Vol.1(5), 184-186

Popular Article

Ichtyoptheries Multifiles Infection in Fishes

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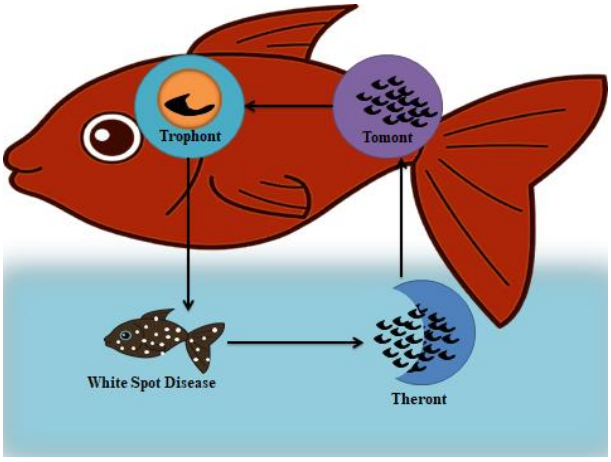
DOI:10.5281/Fishworld.13338300

The ectoparasite *Ichthyophthirius multifiliis*, which infects freshwater fish, is the cause of the white spot illness, or Ich. One of the most prevalent and enduring illnesses in fish is ich. It manifests as up to 1 mm white nodules that resemble white salt grains on the body, fins, and gills of fish. Every white patch is a parasitic encysted. It is simple to introduce into a home aquarium or fish pond by transferring fish or equipment from one fish-holding unit or pond to another. The organism's quick reproduction cycle and distinct life phases make it challenging to regulate once it enters a large fish growing facility. The sickness is treatable with caution, but it will cost a lot in lost fish, labor, and chemical costs.

As the protozoa penetrate the tissues, they injure the skin and gills, resulting in skin loss and ulceration. Severe infections quickly cause demise due to condition loss. When a fish's gills are damaged, its ability to breathe is compromised, which lowers its ability to take in oxygen from the water. The fish become less resilient to low oxygen levels in the water as a result of this.

Biology

- **Classification**: It belongs to the phylum Ciliophora, class Oligohymenophorea.
- **Morphology**: The parasite has a distinctive round shape and is covered in cilia, which help it move. The visible white spots on infected fish are actually cysts containing the parasite.



Life Cycle

Ichthyophthirius multifiliis has a direct life cycle with three main stages:

Trophont Stage: This is the feeding stage where the parasite is embedded in the fish's skin or gills, causing the characteristic white cysts. The trophont feeds on the fish's tissue and grows.

1. **Tomont Stage**: While completely developed, the trophont separates from the fish, forms a habitat, generally on the substrate or surfaces of the aquarium, and starts to divide. A single tomont can give birth to hundreds of young parasites. By creating infectious theronts during up to ten binary fission divisions, tomont can divide quickly and attack fish.

2. **Theront Stage**: The cyst bursts open, releasing theronts (free-swimming infective stages) into the water. Theronts must find a host fish within a short period (usually 24-48 hours) or they will die. Once they find a host, they penetrate the skin or gills, transforming into trophonts, and the cycle begins again.

Symptoms in Fish

- **White Spots**: Small, white nodules (1-2 mm) on the skin, gills, and fins.
- **Behavioral Changes**: Flashing or rubbing against objects, lethargy, and erratic swimming.
- **Respiratory Distress**: Rapid or labored breathing, especially if gills are heavily infected.
- **Decreased Appetite**: Infected fish often eat less or stop eating entirely.
- **Secondary Infections**: Open wounds from the cysts can lead to bacterial or fungal infections.

Treatment

1. **Chemical Treatments**:
    - **Formalin**: Effective but needs to be used with caution due to its toxicity.
    - **Malachite Green**: Commonly used in combination with formalin.
    - **Copper Sulfate**: Another effective treatment, though copper-sensitive species must be treated carefully.
    - **Acriflavine**: Less commonly used but can be effective.
2. **Temperature Increase**: Raising the water temperature (within the tolerance range of the fish) can speed up the life cycle of the parasite, making it more vulnerable to treatments.
3. **Salt Baths**: Adding salt to the aquarium (usually 1-3 grams per liter) can help reduce the parasite load. This method is not suitable for all fish species.
4. **Quarantine and Isolation**: Infected fish should be isolated to prevent the spread of the parasite.

Prevention

- **Quarantine New Fish**: Always quarantine new fish for at least two weeks before adding them to the main tank to ensure they are not carrying the parasite.
- **Maintain Good Water Quality**: Regular water changes, proper filtration, and avoiding overfeeding help maintain a healthy environment that reduces stress and susceptibility to infections.
- **Avoid Overcrowding**: Overcrowding can lead to stress and poor water quality, both of which can increase the risk of Ich outbreaks.
- **Regular Monitoring**: Keep a close eye on fish for early signs of disease. Early detection and treatment are crucial.

Impact

Ichthyophthirius multifiliis can cause significant morbidity and mortality in freshwater fish populations if not managed properly. It is a common problem in aquaculture, ornamental fish

trade, and natural freshwater environments. Effective management practices are essential to control and prevent outbreaks.

Research and Developments

Ongoing research aims to develop more effective treatments and management strategies, including vaccines, biological control agents, and improved diagnostic methods to detect the parasite at early stages. Understanding the life cycle and behaviour of *Ichthyophthirius multifiliis* is crucial for developing effective control measures and ensuring the health and well-being of freshwater fish.

Reference

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