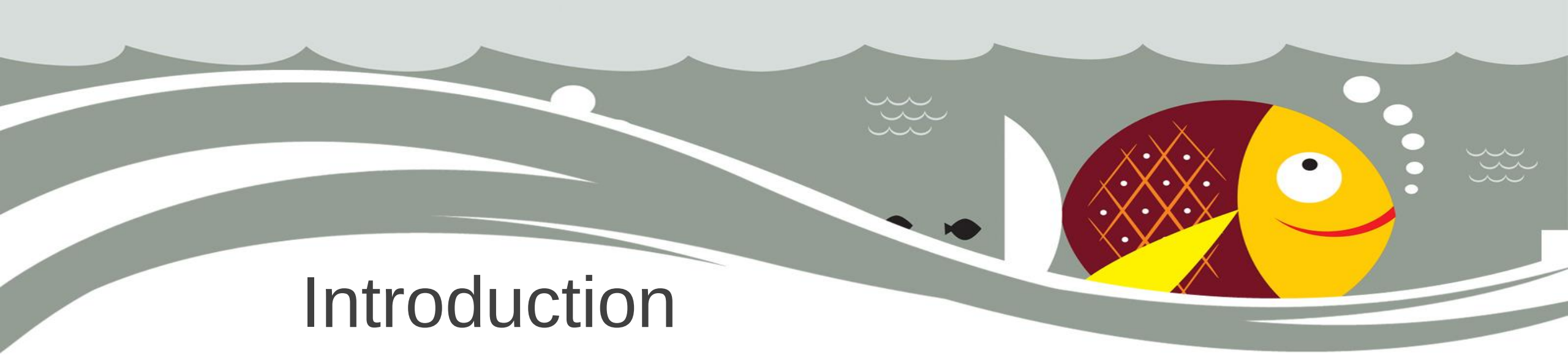
Fungal Diseases I



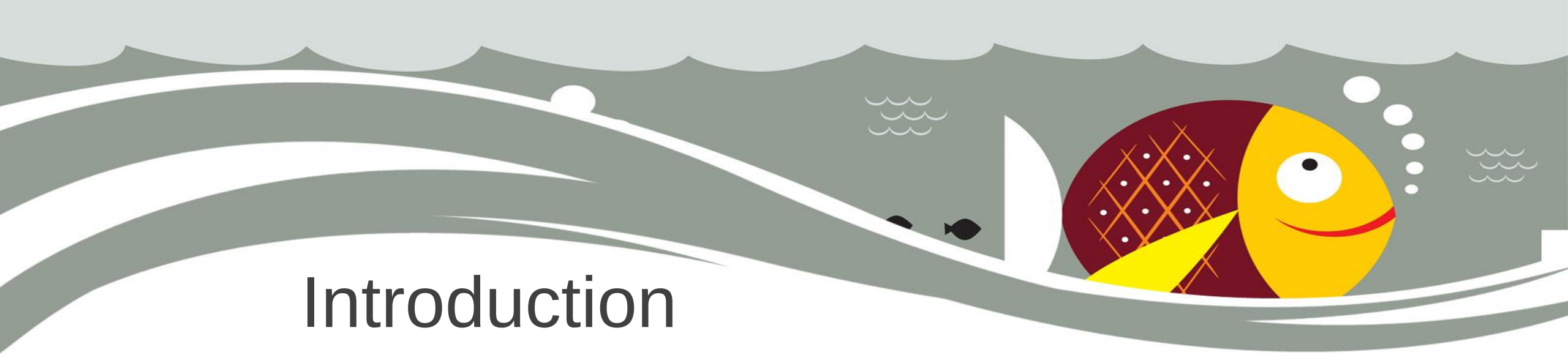
Introduction

Fungi are a group of organisms called heterotrophs that require living or dead matter for growth and reproduction.

Unlike plants, they are incapable of manufacturing their own nutrients by photosynthesis.

In most cases, fungi serve a valuable ecological function by processing dead organic debris.

All fungi produce spores--and these spores spread disease.



Introduction

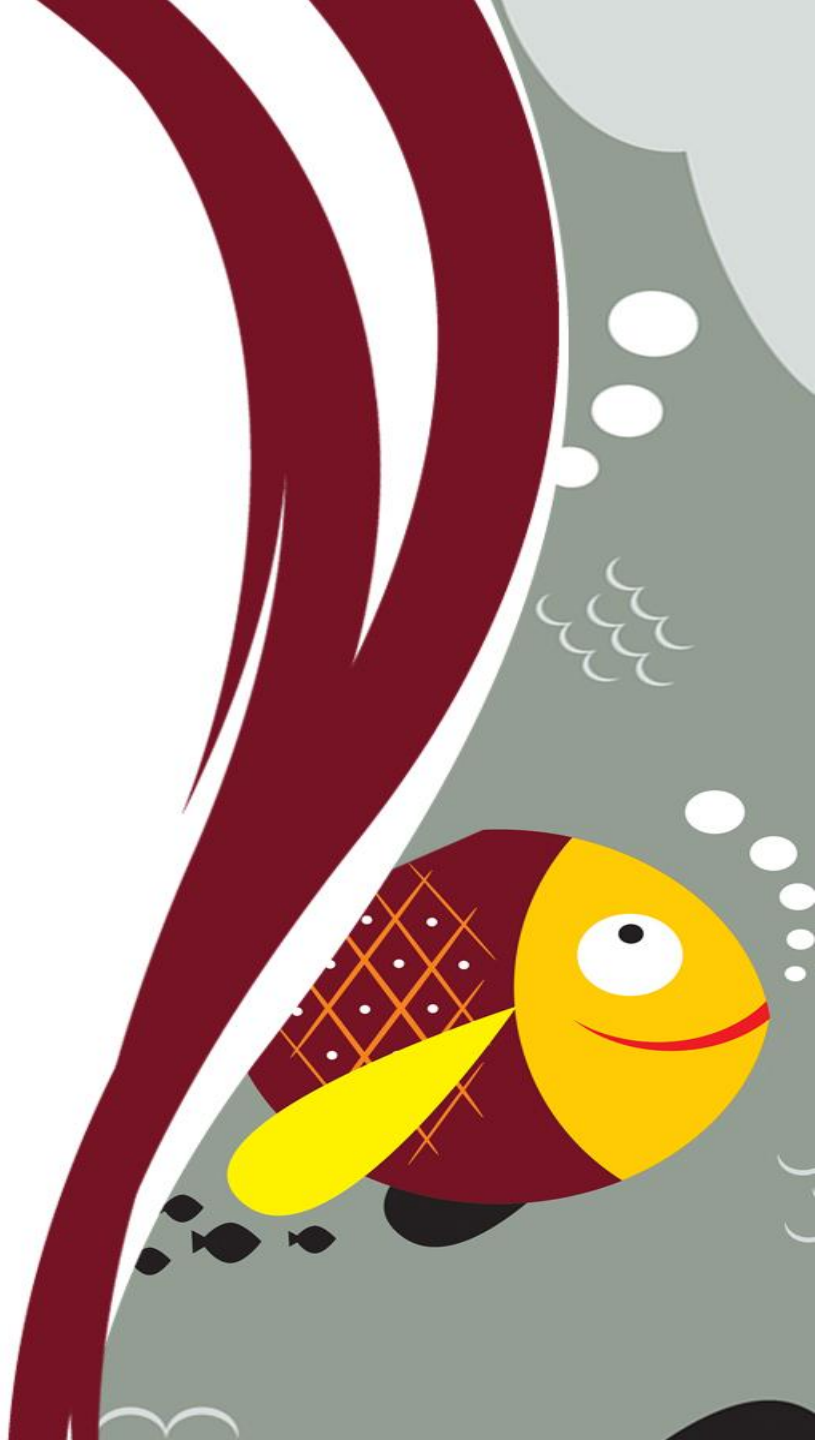
The fungal spore is like a seed which is resistant to heat, drying, disinfectants and the natural defence systems of fish.

The three most common fungal diseases are discussed here.

They are known as **Saprolegniasis**, **Branchiomycosis**, and **Ichthyophoniasis**.

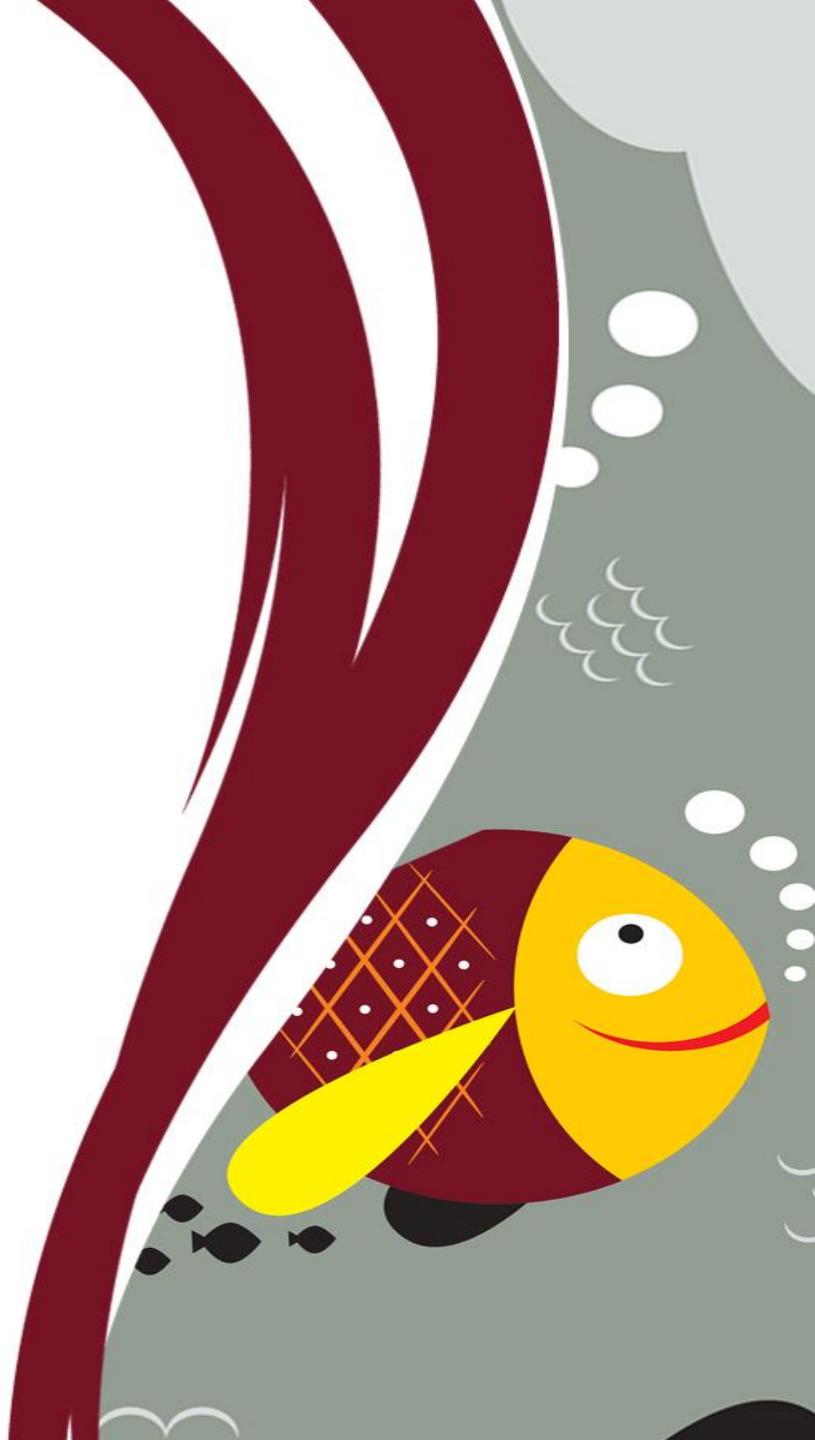
Saprolegniasis

- The disease saprolegniasis is caused by freshwater fungi usually in the genus Saprolegnia.
- Saprolegniasis often is used indiscriminately to describe any cotton-like growth of fungus adherent to skin or gills which may include any one of several genera of molds.



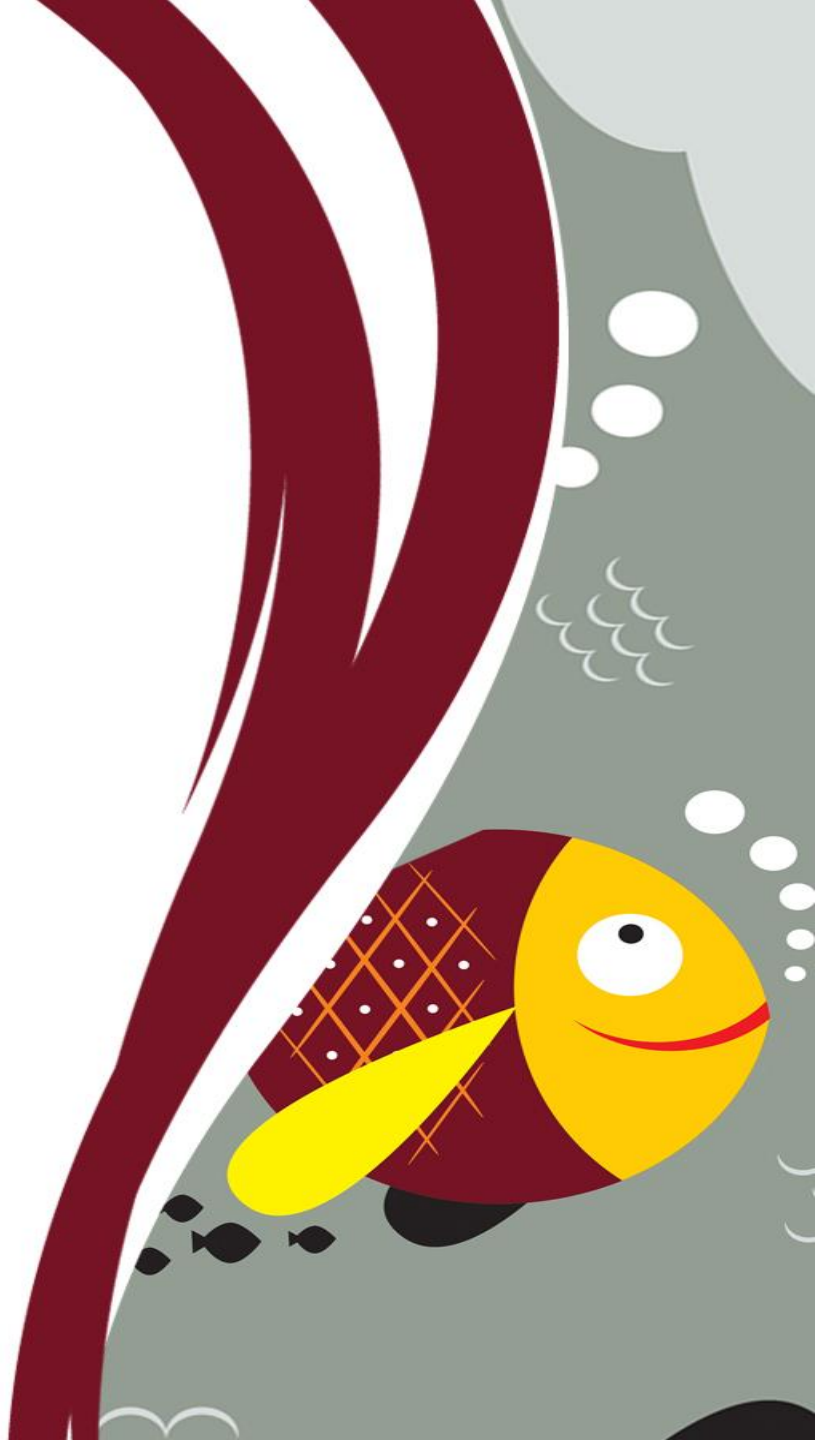
Saprolegniasis

- The fungi are found worldwide in freshwater, although some species may occur in brackish water.
- Some species of ***Saprolegnia parasitica*** can produce a systemic mycosis and are considered primary pathogens.



Saprolegniasis

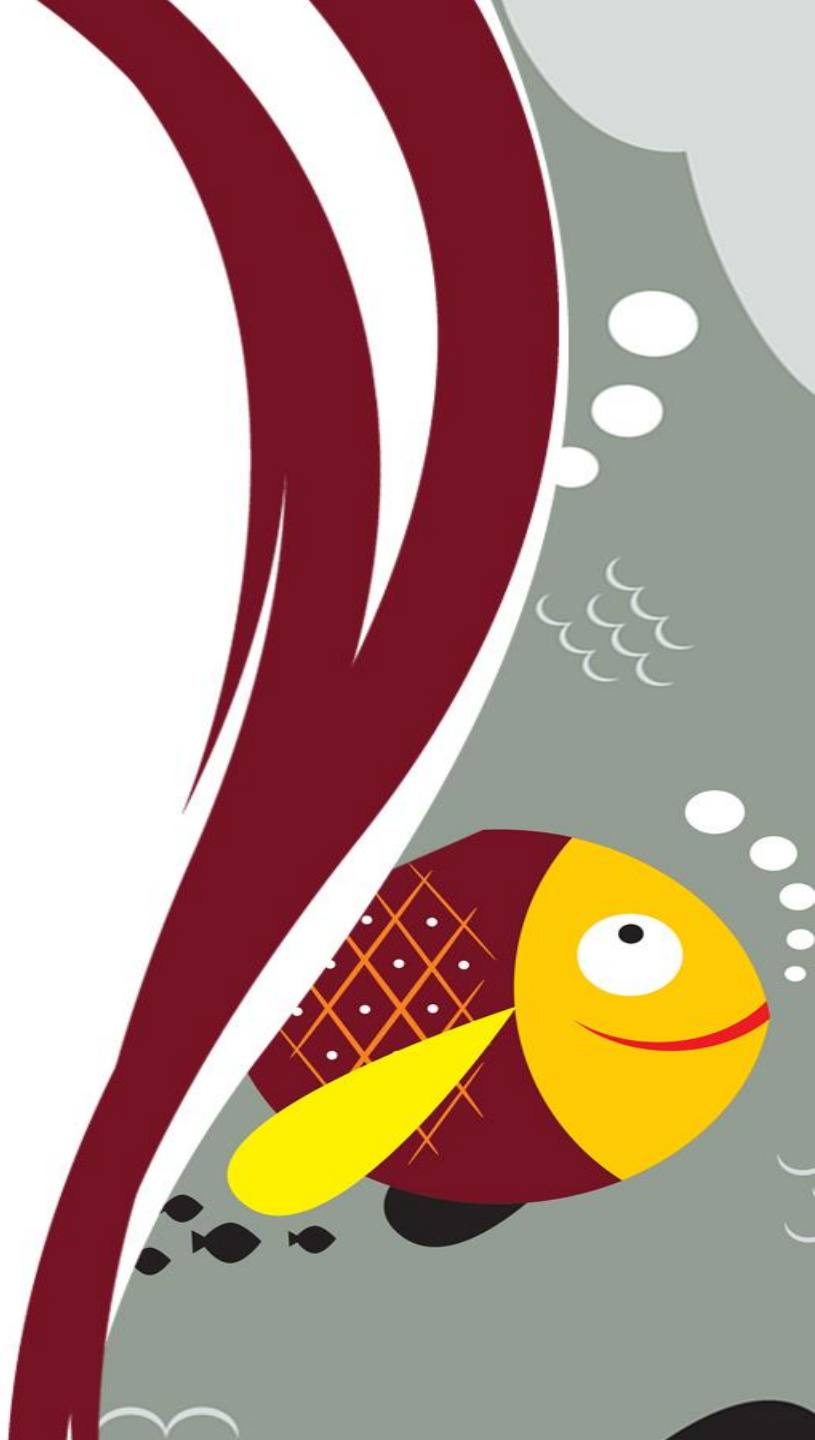
- ***Saprolegnia parasitica***
- ***S. invaderis***
- *S. mixta*
- *S. ferax*
- *S. monoica*
- *S. thureti*



Saprolegniasis

Transmission:

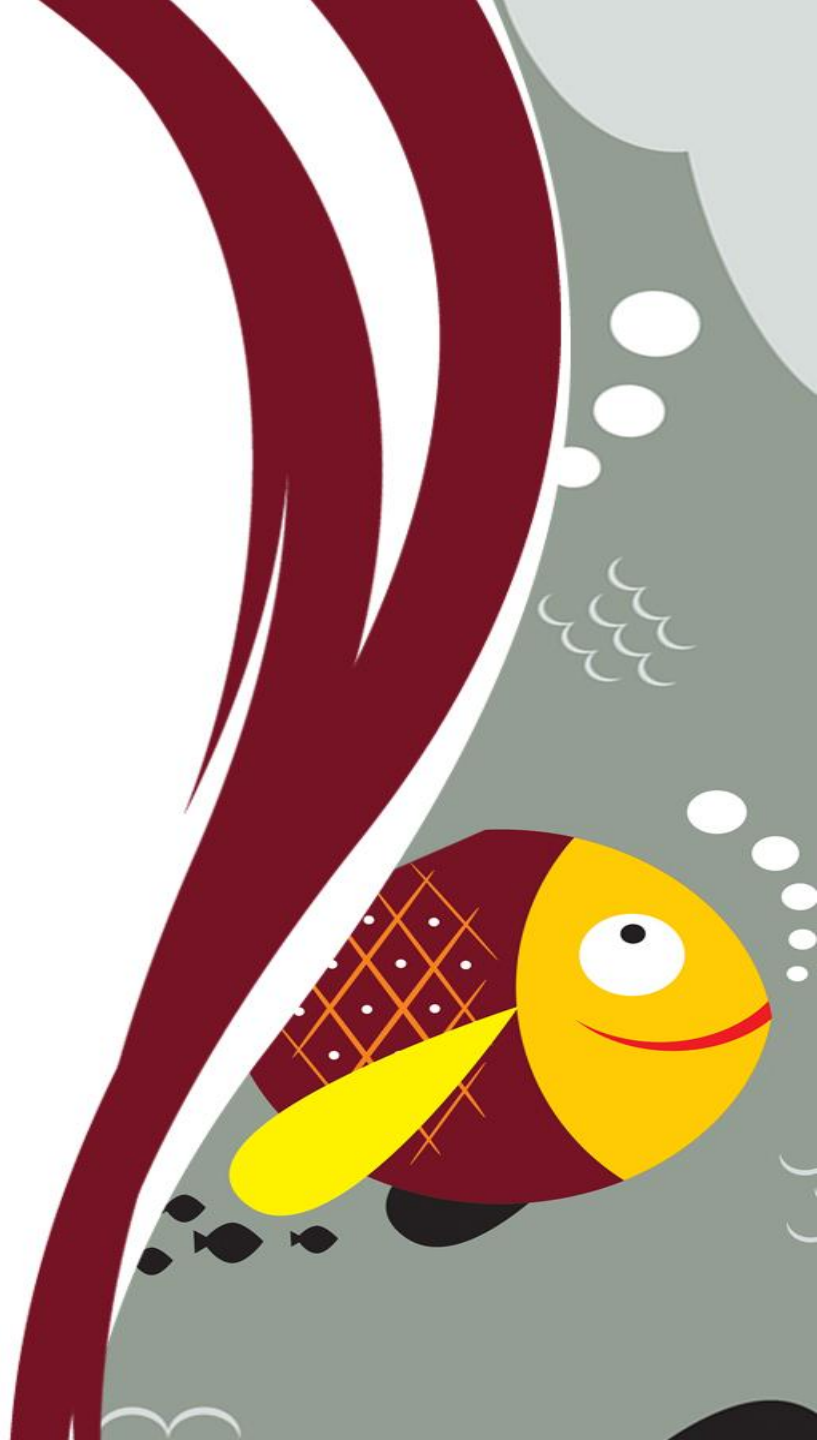
- External fungal infections are transmitted through ambient water by **infectious biflagellated zoospores** released from **hyphal sporangia**.
- Systemic infections in cultured fish occur by ingestion of uneaten food that has been colonized by fungal hyphae.
- Factors of environmental stress play an important role in the etiology of the external disease.



Saprolegniasis

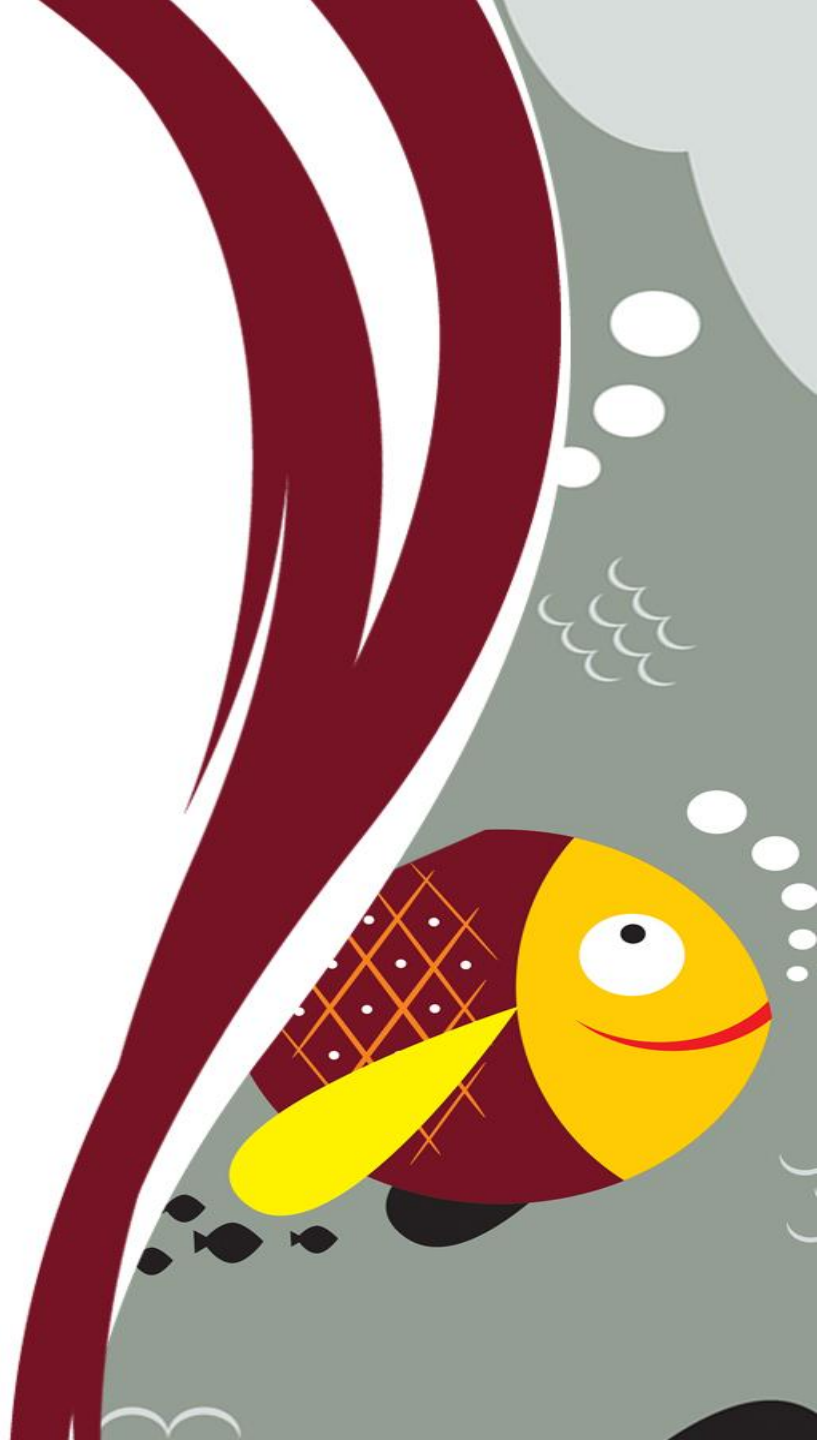
Clinical signs:

- Externally, the fungus appears **as focal white to brownish cotton-like patches** on the surface of the skin and/or gills.
- **Early lesions** consist of **pale foci** with peripheral areas of **erythema** and a central zone of lifted scales which becomes ulcerated, exposing underlying musculature.



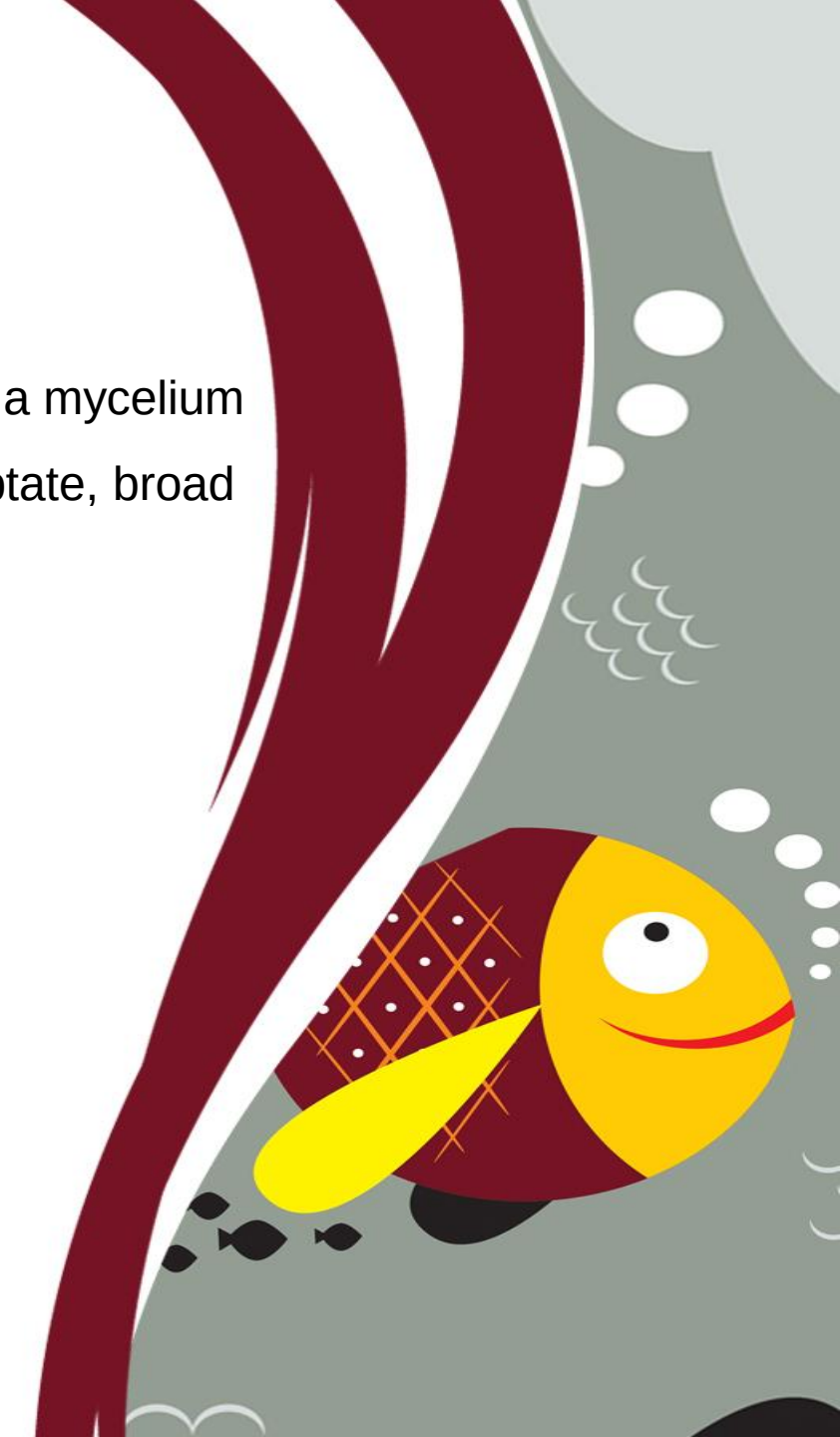
Saprolegniasis

- **Systemic infections** are characterized by **mycelial masses** in the gut and surrounding viscera causing peritonitis with extensive hemorrhage, necrosis and adhesions.
- In smaller juvenile fish external signs of bloating caused by *gut obstruction may progress to perforation of the abdominal wall*.



Saprolegniasis

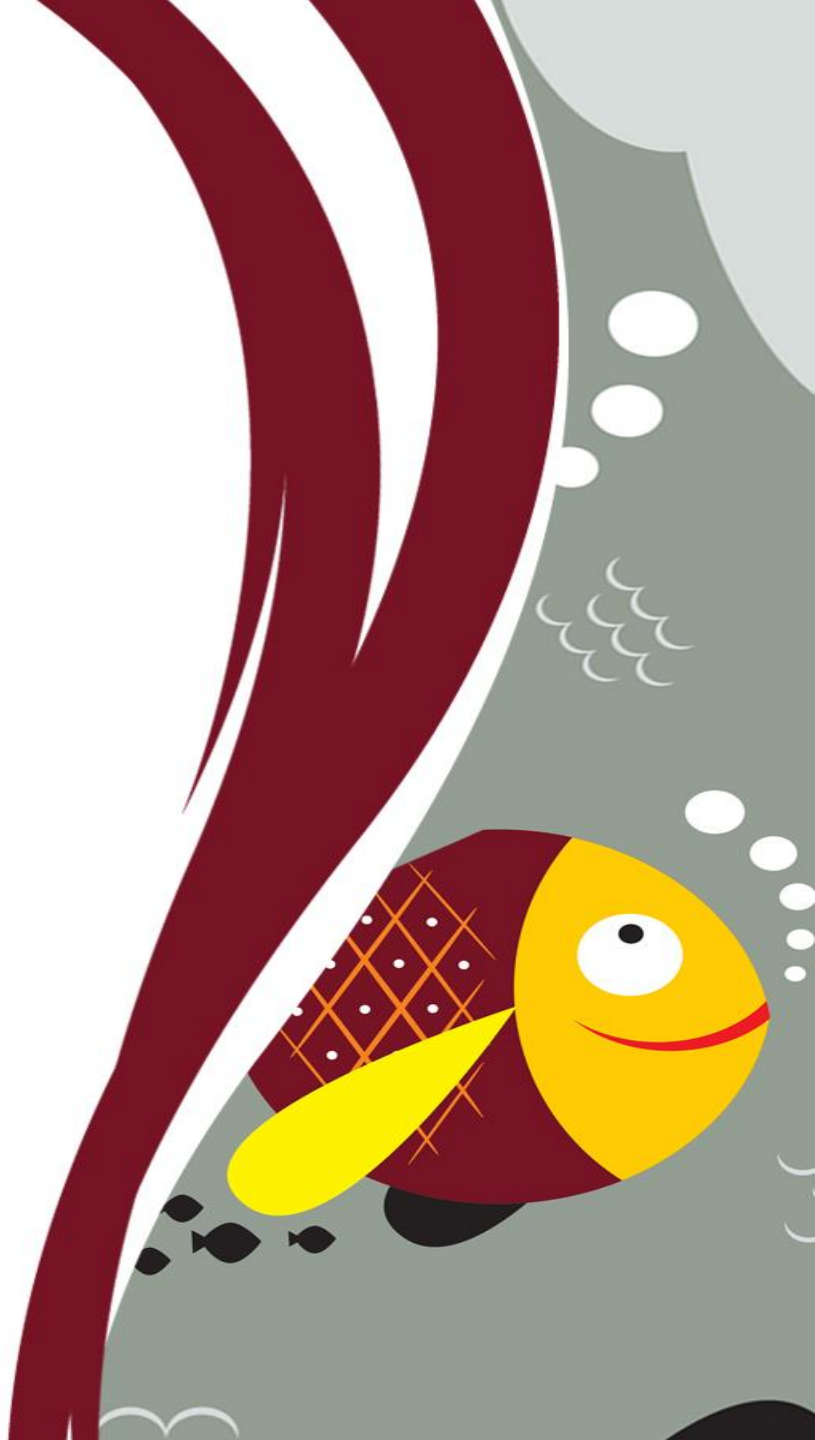
Microscopic examination of wet mounts from these lesions usually reveal a mycelium consisting of the characteristic transparent, cenocytic, branching, non-septate, broad (approximately 7 to 40 pm in width) hyphae.



Saprolegniasis

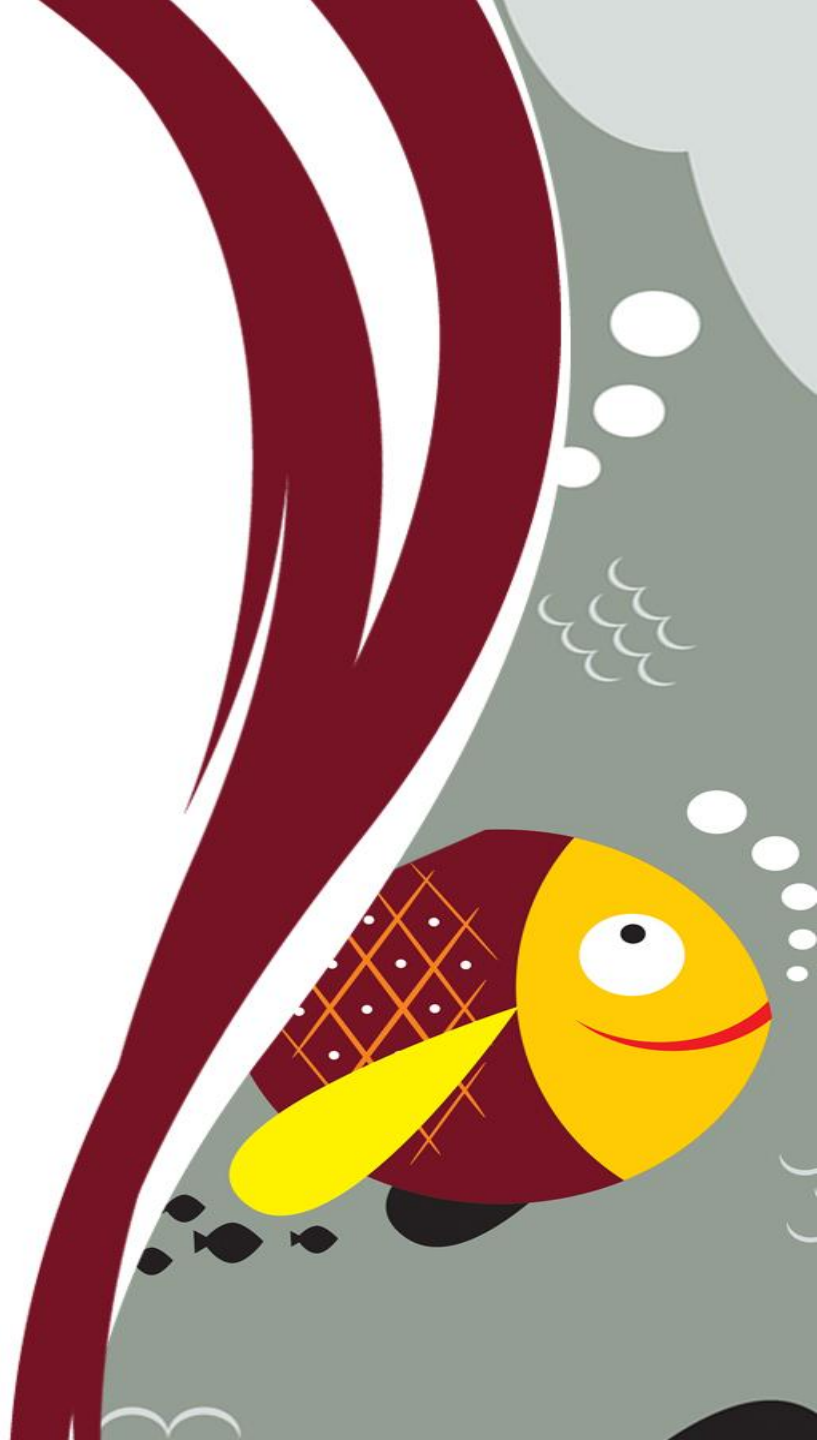
The infiltrates, if present, are usually composed of **lymphocytes and macrophages**.

Also, chronic inflammatory infiltrates (**macrophages, epithelioid macrophages and multinucleated giant cells**) have been described with saprolegniasis.



Saprolegniasis

Concomitant bacterial infections may also contribute to the severity and composition of the inflammatory response. Microscopically, there is usually regionally extensive dermal necrosis, hemorrhage, edema, and myocyte necrosis.



Saprolegniasis

Management and Control

- Saprolegniasis is best prevented by good management practices--such as good water quality and circulation, avoidance of crowding to minimize injury, and good nutrition.
- Once *Saprolegnia* is identified in an aquatic system, sanitation should be evaluated and corrected.

Saprolegniasis

Management and Control

- Common treatments include potassium permanganate, formalin, and povidone iodine solutions. Over treatment can further damage fish tissue, resulting in recurring infections.
- Bath treatment in NaOH (10-25g/lit for 10-20min), KmNO4 (1g in 100lit of water for 30-90 min), CuSO 4 (5-10g in 100 lit water for 10- 30min).