

FUNGUS MAP

- What is Saprolegniasis?
- Saprolegnia spp. Defined
- Saprolegnia Life Cycle
- Saprolegniasis In Amphibians
- Clinical Signs of Saprolegniasis
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WHAT IS SAPROLEGNIASIS

- Saprolegniasis (pronounced "Sap-ro-leg-ni-ah") is term used to describe infection caused by *Saprolegnia spp*.
- A disease caused by oomceytes or "water moulds" that infect the skin, gills, and eggs of fish and aquatic amphibians.
- It commonly affects newts, mudpuppies, aquatic frogs, and tadpoles.
- It's found EVERYWHERE in freshwater and soil.

SAPROLENGIA: WATER MOLD OOMCEYTE

- Produce a motile sexual biflagellate spore called hyphae.
- Sporangia can germinate directly to produce germ tubes or "indirectly" to produce zoospores, a trait which is often temperature dependent, with zoospores being produced at cooler temperatures.



SAPROLEGNIA CONTINUED...

- Visible as white or gray patches of filamentous mycelium
- Characterized by an external, cotton-like appearance that radiates out in a circular, crescentshaped or whorled pattern.







SAPROLEGNIA IN AMPHIBIANS

- Saprolegnia are found in three situations when concerning amphibians:
- 1. Saproglenia only invade dead or unfertilized eggs as part of their normal process.
- 2. May opportunistically or readily cause secondary infections in damaged eggs or in compromised amphibian adults.
- 3. May at times be considered a primary pathogen to amphibian eggs.



1. INVASION OF AMPHIBIAN EGGS

• Affected eggs appear to have a thin layer of white fuzz over the surface.



2. INVASION OF COMPROMISED AMPHIBIAN ADULTS

- Clinical signs include the external appearance of fungal colonies that appear fluffy or cottonlike in texture
- Ulcerated skin may be visible as small circular area that can spread to internal organs.
- Infections generally affect the tail, hindlimbs, gills, and oral mucous membranes



3. PRIMARY PATHOGEN OF FISH AND AMPHIBIAN EGGS

- Very common in hatchery fish. Fish stocked in lakes are common carriers of *Saprolegnia*.
- Kiesecker et al. (2001b) performed experiments to determine if rainbow trout (Oncorhyncus mykiss) can be a vector for transferring Saprolegnia to populations of boreal toads (Bufo boreas).



CLINICAL SIGNS OF SAPROLEGNIA

- Other signs of saprolegniasis include lethargy, difficulty breathing, lack of appetite, and weight loss. Sores on the skin that do not heal may occur as the infection progresses.
- Salamanders have exhibited anorexia, weight loss, lethargy, vomiting, and respiratory distress.
- Death has occurred from osmoregulatory impairment in severe cases.

AMPHIBIAN DIE-OFFS ON THE RISE

- It can cause significant mortality in amphibian communal egg masses, even up to complete loss of reproductive effort (Blaustein *et al.*, 1994).
- It affects some species more than others, and can therefore disrupt competitive interactions (Kiesecker and Blaustein, 1999).
- Saprolegnia has been found on dead amphibian larvae after mass mortality events (Bragg & Bragg 1958).
- Increases mortality of injured adults and tadpole deaths, however it is often an underlying causal factor to a traumatic injury or after an infectious agent has set in.
 Some amphibian populations experience extensive die-off events caused by saprolegrinais, disease events do not seem to exacerbate natural breeding population fluctuations (Gahl 2007).
- natural breeding population fluctuations (Gahl 2007). • Research suggests mortality of post-embryonic amphibians contributes significantly to population declines (Biek et al. 2002).



- Bath treatment with antifungal agents such as benzalkonium chloride, copper sulfate, or potassium permanganate
- Natural defense against fungal infections are mucous production and skin sloughing makes it hard for spores to attach.





• No human health concerns associated with Saprolegnia



Obama's appetite for frog legs may be wiping out frogs though.

WORK CITED

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