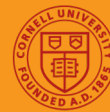


Perkinsea Infection



College of
Veterinary Medicine



BASICS

Severe Perkinsea Infection (SPI) is a disease of tadpoles caused by parasitic single-celled organisms in the Phylum Perkinsea.

Perkinsea organisms live in fresh water. Tadpoles become infected by **INGESTING INFECTIOUS PARASITES** or when parasites enter through mucous membranes in the mouth and gills or through the skin. Once in the body of the tadpole, the parasites multiply and spread throughout the internal organs via the blood and lymphatic system.

Tadpoles of numerous species of frogs, including Southern leopard frog, Mississippi gopher frog, gopher frog, American bullfrog, wood frog, green frog, Florida cricket frog, and spring peeper, have been reported with SPI. **ADULT FROGS ARE NOT AFFECTED.**

SPI causes large-scale die-offs of tadpoles with up to 95% mortality due to organ failure. **CLINICAL SIGNS** in infected tadpoles include bloating, subcutaneous edema, skin reddening, areas of white skin discoloration, swimming in circles, and inability to dive. Internally, enlargement of the liver, spleen, and kidneys results from invasion by the parasites. Death occurs rapidly from multi-organ failure, so tadpoles are typically in good body condition.

Rarely, infected tadpoles remain asymptomatic or survive.

DIAGNOSIS of SPI is made by histopathologic evidence in internal organs with confirmation by PCR testing.

There is **NO TREATMENT** for SPI.



**POPULATION
IMPACT**



**INGESTION
AND DIRECT
CONTACT**



**FROG
TADPOLES**



DETAILS

Severe Perkinsea Infection, also known as **DERMOMYCOIDES**, is an emerging disease of frogs and is the third most common infectious disease of frogs after ranavirus infections and chytridiomycosis. It leads to population declines by severely reducing the numbers of tadpoles added to frog populations. Recovery of the Mississippi gopher frog, a federally protected species, has been severely affected by outbreaks of SPI.

SPI was first reported in 1999 in bullfrog tadpoles in New Hampshire. Since then, it has occurred in other states, including New York, and is likely distributed throughout North America. The infection has also been reported in Panama and Ecuador and in captive tree frog tadpoles in the United Kingdom.

Perkinsea parasites have a direct life cycle. Free-living zoospores are ingested by tadpoles or enter via mucous membranes in the mouth and gills or through the skin. In the tadpole, the zoospores develop into trophozoites which multiply throughout the tissues of the tadpole causing damage, ultimately resulting in organ failure. When the tadpole dies, trophozoites develop thick walls to become hypnospores. These resting stages remain in the sediment until they reenter the water, sporulate to become infective zoospores, and enter a new host.

OUTBREAKS of SPI typically occur between June and September in temperate regions but can be seen year-round in southern areas. Outbreaks result in the sudden deaths of hundreds to thousands of tadpoles over weeks to months and can recur in affected locations.

PRECAUTIONS AND PREVENTION Perkinsea hypnospores can survive in the environment for long periods of time and are highly resistant to disinfectants, such as bleach. Biosecurity measures are especially important to prevent spread of the organism. When working in the field, organic material, such as mud and plant debris, should be thoroughly removed

from boots, clothes, and equipment before being disinfected. Wild tadpoles and frogs should not be moved between habitats, and captive animals should not be released into the environment. All newly acquired captive frogs should be initially quarantined from other amphibians until it has been confirmed that they are disease free. Dispose of dead animals by incineration or deep burial to prevent scavenging.

Below: Tadpole group swimming in a stream.
Photo courtesy of Melissa Fadden.

