# ***Heterosporis* sp.** *Yellow perch parasite*

*Heterosporis sp.* is a parasite of fish that infects muscle cells. Infected fillets have white, opaque areas in the muscle and appear "freezer-burned" or as if the tissue has already been cooked. This parasite was first identified in yellow perch from Catfish Lake in the Eagle River Chain of Lakes (Vilas County) Wisconsin in 2000. Since then, it has been detected in other lakes in Wisconsin, Michigan, Minnesota, and Canadian waters of eastern Lake Ontario. The percent of infected fish in these waters can range from less than 5% to about 30%. Prior to 2000, *Heterosporis* sp. infections were only reported in tank reared aquarium species such as angelfish and cichlids in Europe, bettas in Thailand, and Japanese eels in Taiwan. The source of *Heterosporis* infections in North America is unknown.

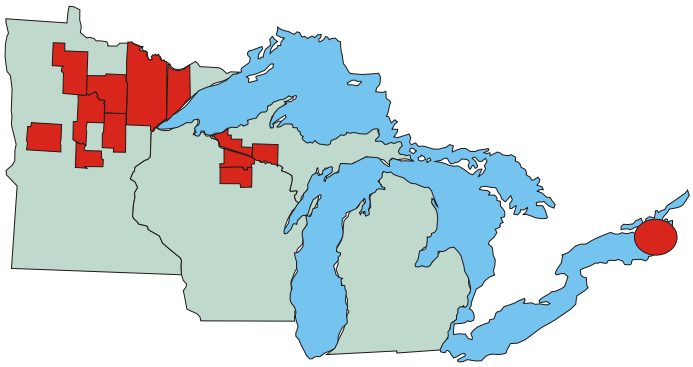
A yellow perch infected with *Heterosporis*. Notice the areas of infection where the muscle is white, opaque and appears freezer-burned or cooked. (Photograph by Dr. Dan Sutherland, University of Wisconsin-La Crosse)

Although the parasite was first observed in yellow perch, natural infections can occur in walleye, northern pike, trout-perch, burbot, pumpkinseed, sculpin and rockbass. Studies at the University of Wisconsin-La Crosse have shown other species can be infected under laboratory conditions: rainbow trout, Coho salmon, brook trout, brown trout, lake trout, white suckers, mosquito fish, channel catfish, fathead minnow, and largemouth bass. Bluegill, lake sturgeon, smallmouth bass, and golden shiners were exposed to spores, but did not become infected.

**The *Heterosporis* Life Cycle.** *Heterosporis* is a microsporidan parasite and part of its life cycle includes the formation of spores inside muscle cells. The spores are the infective stage of the parasite. Infection occurs when a fish eats an infected fish, or when a fish is exposed to spores in the water. Spores are released into the water when an infected fish dies and decomposes and can remain infective in water for at least two months at room temperature and up to one year in refrigerated water. Based on lab studies, opaque areas of infection in the muscle are visible to the eye about 5 weeks after a fish becomes infected. Over time, the entire muscle mass of a fish will be filled with spores and the entire fillet will become white and opaque.

*Heterosporis* spore bundles and spores

## *Heterosporis* distribution (as of March 2005)



**Lakes where *Heterosporis* infections have been confirmed. (The county is included in parentheses).**

**Wisconsin**
Catfish (Vilas)
Eagle River Chain of Lakes (Vilas)
Big Arbor Vitae (Vilas)
Lac Vieux Desert (Vilas)
Robinson (Vilas)
Big St. Germain (Vilas)
Echo (Oneida)
Columbus (Oneida)

**Michigan**
Lac Vieux Desert (Gogebic)
Lake Emily (Iron)

**Ontario**
Eastern waters of Lake Ontario

**Minnesota**
Mille Lacs (Aitkin)
Vermillion (St. Louis)
Leech (Cass)
Gull (Cass)
Winnibigosh (Cass)
Steamboat (Cass)
Basswood (Lake)
Clitheral (Ottertail)
Horsehead (Ottertail)
Bass (Itasca)
Sand (Itasca)
Andrusia (Beltrami)
Alexander (Morrison)

**Species naturally infected with *Heterosporis*:**

**In Wisconsin:** yellow perch, walleye, pumpkinseed, sculpin, trout-perch, rock bass, and burbot; **In Minnesota:** yellow perch, walleye, and northern pike; **In Michigan**: yellow perch; **In Ontario:** yellow perch, rock bass, and pumpkinseed

**Controlling the spread of *Heterosporis***

Fisheries biologists, anglers, commercial fishermen, bait harvesters and others who are involved with on-the-water activities can take the following precautions to prevent the spread of *Heterosporis* as well as the spread of other aquatic invasive species:

- Do not discard infected fish in a lake or river; place them in the garbage.

- Empty live wells and bilges away from water, in an area where the water will be absorbed into the ground.

Several methods have been found to effectively kill *Heterosporis* spores:

- Thoroughly dry boats, nets and other gear after using them, but before entering a new waterbody. Gear must be completely dry for a minimum of 24 hours for dessication to effectively kill the spores.

- Immerse gear in a chlorine bleach solution for five minutes (3 cups of household bleach in 5 gallons of water). Metal gear may be corroded when immersed in chlorine solutions. After gear has been disinfected, rinse it with clean water to remove residual chlorine. Keep chlorine solutions away from natural waterbodies. Fish and other aquatic life can be killed by trace amounts of chlorine in the water.

- Freezing at -4 °F for 24 hours (home freezer) will also kill the spores.

Until more is known about the susceptibility of other species of fish to infection by *Heterosporis*, fish should not be moved from lakes known to be infected with *Heterosporis* to other waters.

***Heterosporis* is not a human health concern** *Heterosporis* infections in the muscle will decrease the quality and change the texture of a fillet. People may choose not to consume infected fish for these reasons. Based on studies at the Centers for Disease Control in Atlanta, GA., there is no evidence that *Heterosporis* can infect people.

***For more information, visit www.glfc.org/heterosporis.htm***

**Great Lakes Fishery Commission**

SPORT FISH RESTORATION