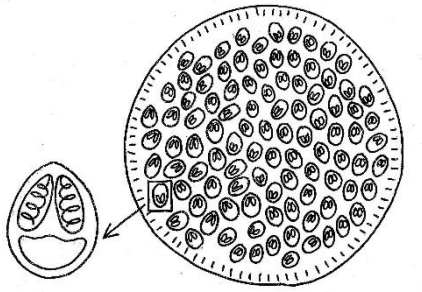
Myxosporidian parasites



A drawing of a myxosporidean cyst and the maturing spores within it.

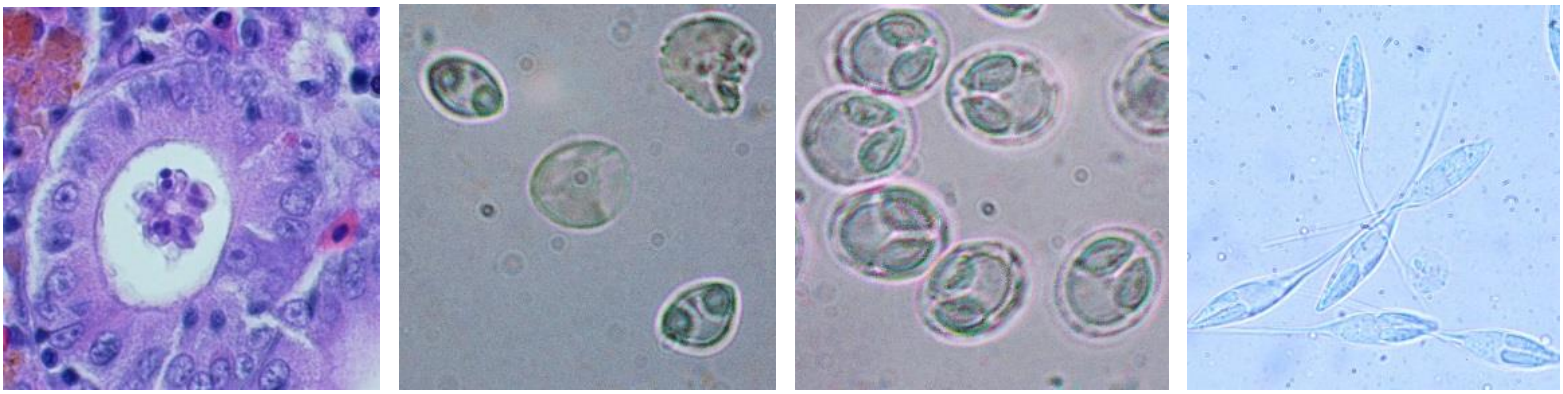
What are myxosporidian parasites?

Myxosporideans are tiny parasites (known individually as spores) that multiply within cysts. These cysts can sometimes be seen with the naked eye. They are very common in fish and can infect every organ. Myxosporideans infect a wide range of animals and around 1,400 different species have been found in fish. The life cycle of these parasites is very complex, with many stages of growth and multiplication. Some species also need other hosts (such as aquatic worms) to complete their life cycle.

The common myxosporidean parasites of fish

There are many species of myxosporidean parasites found in freshwater fish in the British Isles. Some species will only infect fish in one group (such as salmonids or cyprinids). The most common are:

- Sphaerospora species that infect the gills, swim bladder and kidney of cyprinids.
- Myxidium species that are commonly found in the kidney and gall bladder of cyprinids.
- Myxobolus species which are found in the skin, muscle, gills and kidney.
- Henneguya species that are commonly found in the gills, muscle and gonads of pike and perch.
- *Tetracapsula bryosalmonae* which causes Proliferative Kidney Disease (PKD) in salmonids.
- Zschokkella species which are commonly found in the gut of eel.
- Ceratomyxa species which are typically found in the gall bladder and gut.

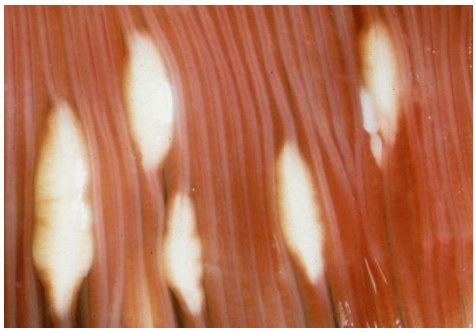


Individual myxosporidean spores of species of Sphaerospora, Myxidium, Myxobolus and Henneguya (from left to right) viewed under a microscope.

What do myxosporidean parasites do?

Most myxosporidean parasites do not cause disease problems, but some can be very damaging and may cause mortality. Large infections can cause irritation, inflammation, individual cell enlargement and necrosis (when tissue cells die) of the surrounding tissue.

When myxosporideans infect the skin and muscle, their cysts cause localised damage to the tissue. If they infect the gills of fish, they can damage them and reduce their surface area. This means that the fish can't take in as much oxygen and could die.



Typical myxosporidean cysts in the gills of a fish.

If fish are infected with myxosporideans in the gut, they can become sluggish, lose weight, develop a dark colouration and retain fluid in the body cavity (known as dropsy) that can cause bulging eyes. Infections in the swim bladder can cause swelling and internal bleeding. Fish infected with Sphaerospora in the swim bladder will show major signs of distress and may also start swimming around in circles. If Sphaerospora infects the kidney, it can cause enlargement and necrosis. This will affect how the kidney works and in some cases, could kill the fish.

Minimising the problems linked with myxosporidean parasites

Though in some cases these parasites can kill fish, they generally only lead to a loss of condition. This makes the fish more likely to become infected by other, more harmful parasites and diseases (pathogens). The most effective way of reducing problems is through good fisheries management, including:

Reducing stress in the fish population

It is easier for parasites to infect fish that are stressed. Stress can be caused by high stock densities, poor habitat and poor water quality.

Careful management of stock levels

High stock densities makes it more likely that fish will ingest the infective parasite spores, causing infections to spread quicker.

Maintaining good fishery habitat

This can reduce the stress levels in fish by providing suitable cover and food. It can also help improve water quality.

Regular monitoring of water quality

This can help you detect problems before they occur. Problems with water quality can make fish more likely to become infected by parasites and other pathogens, leading to heavier levels of infection.

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