

Dermocystidium infections in fisheries

What is Dermocystidium?

Species of *Dermocystidium* are small, spore-forming parasites that are very closely related to fungi. They usually affect the body, fins or gills of fish causing raised rounded cysts that can appear unsightly. Infections are relatively uncommon in fisheries, although we have seen an increase in cases in recent years, particularly in carp. These have included heavy infections of raised cysts covering large areas of the skin and fins of affected fish, leading to inflammation and localised tissue damage.



A typical *Dermocystidium* cyst on a carp fin.

What do these infections look like?

Dermocystidium cysts typically appear as smooth, raised rounded swellings on the skin, fins and gills. Less frequently cysts may be found surrounding the eyes, mouth and nares. These often appear white or pale pink in colour, with a granular appearance and pink or reddened edges. *Dermocystidium* infections are most frequently seen in spring and early summer. The appearance of these cysts can vary between fish species - in carp and crucian carp individual cysts can measure up to 2 cm across and can occasionally be mistaken for carp pox (a benign viral infection that causes white waxy lumps on the skin). In perch, the cysts are very small, often less inflamed and usually restricted to the fins. These infections are very subtle and very rarely lead to any significant host response.

What species of fish are affected?

Infections of *Dermocystidium* have been reported from a range of different fish species including common carp and koi, crucian carp, perch, eel, salmon and even bullheads. It is thought that these may be caused by different species of *Dermocystidium*, although this requires further clarification. Staff at our National Fisheries Laboratory have been working with partners to clarify the genetic characteristics of *Dermocystidium* to help give us a better understanding of species diversity and the role of these infection in fisheries.



Dermocystidium cyst along the jaw of a crucian carp (top) and spores within (inset). A heavy infection of raised cysts on the body of mirror carp (bottom)

How is Dermocystidium spread?

The life cycle and transmission of *Dermocystidium* are poorly understood. Cysts appear to develop through the spring and early summer, increasing in size from small discrete swellings to larger, red and inflamed lesions covering larger areas of the skin, fins and gills.

These cysts eventually rupture, releasing the white thread-like hyphae (long branching threads) along with millions of tiny spores into the water. Each spore

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measures just a few thousandths of a millimetre and are very characteristic when seen under the microscope. It is thought that fish become infected through ingestion of spores. It is thought that infections can persist from year to year in fisheries by overwintering cysts and the spores can survive in a dormant state if conditions are unfavourable for growth.

What does Dermocystidium do?

Different species of Dermocystidium affect fish in slightly different ways. Infections in common carp, crucian carp and eels can cause quite large cysts leading to localised tissue damage, loss of skin integrity and damage to the fins. Infections in perch are typically less obvious and rarely cause any notable tissue damage.

In heavy infections, Dermocystidium can cover large regions of the body. Such infections can also originate below the epidermis, causing swelling of the surrounding tissues as they enlarge. As lesions swell, the skin covering the cysts gets progressively thinner, where it is possible to see the white thread-like contents inside. Most of the damage caused to fish occurs when the mature cysts rupture, causing inflammation and damage to surrounding tissue. The pathology caused by these infections is usually localised and for healthy fish in healthy environments, the lesions usually heal quickly. However, these small lesions can also provide an entry for secondary infections, so it is always important to remain vigilant.



Advanced Dermocystidium cysts on the dorsal fin of common carp showing inflammation and secondary infection.

We have never observed Dermocystidium causing mortality in fisheries and infections are often seen in otherwise healthy fish that then recover without any further complications.

Minimising any impacts from Dermocystidium

Compared with many other disease conditions, relatively little is known about Dermocystidium and the factors that lead to the development of these infections. As it normally affects only a small number of fish without serious problems, there is seldom any need for intervention or specific management measures. Generally these lesions should be left well alone and any handling of affected fish minimised as much as possible. As with most disease conditions, the best thing to do is to maintain healthy fishery conditions to prevent stress, promote healing and minimise the risk of secondary infections developing.

What should I do if I observe these infections?

If you are concerned about any aspect of fish health or encounter dying or diseased fish please report these to our **incident hotline immediately: 0800 80 70 60**.

If you suspect Dermocystidium we are keen for these to be reported to us so we can monitor these infections and help fisheries that need it. Taking images can be very useful as a record of skin abnormalities and these can be sent to us for expert opinion.

For further information of Dermocystidium, or any other fish health condition, please contact our National Fisheries Laboratory on 02084 745244 or 07825 111723, or e-mail us: fish.health@environment-agency.gov.uk

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