

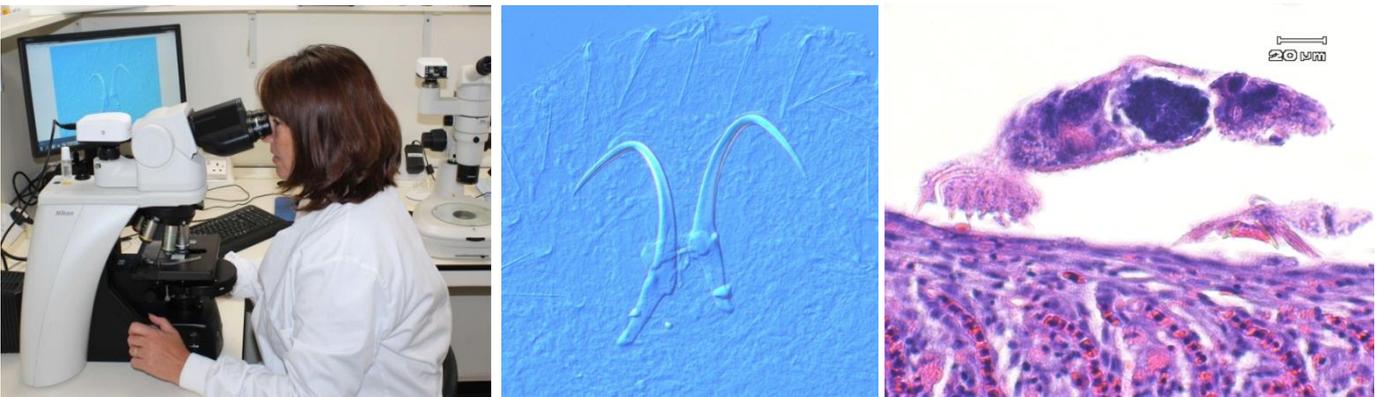
Gyrodactylus sprostonae

National Fisheries Services

Mortality investigations conducted by National Fisheries Services, Brampton have revealed a parasite, called *Gyrodactylus sprostonae* as the cause of serious losses in carp fisheries. These include mortalities of high value specimen fish from large, well-managed fisheries. The sudden increase in disease cases, number of outbreaks in England and high economic losses to fisheries, suggest that this parasite is an important emerging pathogen of carp warranting further attention. We are continuing to monitor this parasite during our mortality investigations and are working with fishery owners and academic partners to improve our understanding of this parasite.

What is *Gyrodactylus sprostonae*?

Gyrodactylus sprostonae is a small monogenean parasite that infects the gills of common carp (*Cyprinus carpio*) and crucian carp (*Carassius carassius*). We have also recorded infections in goldfish (*Carassius auratus*) and the non-native silver carp (*Hypophthalmichthys molitrix*). Individual parasites measure less than 0.5mm long and attach by means of paired hooks known as the haptor. It is the size and shape of these hooks that allow the parasite to be identified. Monogenea are parasitic worms, more commonly known as 'flukes'. They typically attach to the skin, fins and gills of fish and are commonly found in our fisheries. However, only a small number of species are known to cause disease problems. Whilst we have recorded heavy infections of many monogenea in fisheries, *G. sprostonae* is the first species to cause multiple, large scale losses.



Parasite detection requires microscopic examinations (left). The main identifying features of *G. sprostonae* are its attachment hooks (centre) which are used to lodge the parasite firmly to the gill tissue (right).

How is *Gyrodactylus sprostonae* detected?

Detection of *Gyrodactylus sprostonae* requires detailed microscopic examination of the gills. The parasites cannot be seen with the naked eye and are often deeply embedded between the gill filaments. Heavy infections of the parasite can cause notable damage to the gills, which may include excessive mucus and loss of normal gill structure, causing pale patches. However, these changes can be caused by a range of different factors and infections. As such, mortality investigations conducted by National Fisheries Services involves detailed screening for all different pathogens including parasites. Once detected, identification of different species relies on careful examination of the parasite's attachment hooks.

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What does the parasite do?

G. sprostonae attaches firmly to the gills, where it feeds on the surface cells. Due to their tiny size, low level infections of monogeneans are seldom of concern and are easily tolerated by healthy fish. However, as infection levels increase, damage to the gills becomes more severe. In the mortalities we have investigated, some fish have harboured in excess of 100,000 parasites within the gills. This has caused severe gill pathology, resulting in respiratory distress, lethargy and mortality.



A *Gyrodactylus* giving birth to their young. The young will attach alongside the parent

What is the life cycle of *Gyrodactylus sprostonae*?

G. sprostonae has a direct life cycle, giving birth to live young (left) that attach to the gills next to the mother. No other organisms are required for the parasite to complete its life cycle. At the time of birth, each parasite already has a juvenile within it, allowing rapid development of the population if conditions allow. Parasite reproduction is often temperature driven, increasing through spring and summer. When conditions allow, individual parasites may give birth every day and so infections can build up very quickly.

Why are some species so damaging?

Skin and gill flukes are common parasites found in most of our fisheries. In most cases, infection levels are kept low by good environmental conditions and the natural defences of the fish host. However, periods of stress, overcrowding or poor water quality can upset this balance, causing infections to rise. The introduction of novel parasites can also lead to sudden disease problems in fish due to a lack of effective defences. The best example of this was the introduction of *Gyrodactylus salaris* to Norway in the 1970s, leading to large scale mortalities of Atlantic salmon parr, with huge economic and ecological impacts.

The importance of monitoring and good fishery management

Examples like *G. salaris* highlight the need to monitor parasites and ensure prompt detection of new and emerging diseases. We continue to monitor parasites, as well as all other pathogens during our mortality investigations, working to protect our fisheries. We also conduct detailed parasite examinations during health checks to identify novel parasites and unusual disease conditions. This work has already identified many new and emerging disease conditions as well as many important non-native pathogens.

Good fishery management can help reduce the risk of triggering many fish health problems. Maintaining good environmental conditions, nutrition and health can help fish fight infection and keep parasites at low numbers. Always get fish health checked prior to stocking and operate good biosecurity at your fishery.

What can you do?

Always report signs of dead or dying fish to the Environment Agency immediately. For further information on *G. sprostonae* or any fish health or disease problem in fisheries, please contact: National Fisheries Services - Fish Health, Ageing and Species, Environment Agency, Bromholme Lane, Bampton, Huntingdon, PE28 4NE. Tel: 02084 745244 or 07825 111723; Email: fish.health@environment-agency.gov.uk

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