

## GS Information

Primarily affects juvenile Atlantic salmon in fresh water.  
Also infects other fish species such as rainbow trout

Fish have a white or grey appearance, often with  
secondary fungal infections

Large scale mortalities up to 95%

High mortalities occur in juvenile wild Atlantic salmon,  
effectively eradicating populations within a few years

No treatment of wild fish. Norway has used chemical  
treatments to eradicate fish from affected rivers

Notifiable disease in the UK

Known to occur in a number of countries in northern  
Europe

Fishing equipment should be cleaned, disinfected and  
dried

### Legal Obligation and Who to Notify

Under the Aquatic Animal Health (England and Wales)  
Regulations 2009 it is a legal obligation to report suspicion  
of GS in any farmed or wild fish to the Fish Health  
Inspectorate.

It is an offence under the Regulations to fail to inform the  
FHI of suspicion of GS.

#### Contact address for further information:

Fish Health Inspectorate (FHI),  
Centre for Environment, Fisheries & Aquaculture Science,  
Barrack Road,  
The Nothe,  
Weymouth,  
Dorset.  
DT4 8UB UK

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Email: [fhi@cefass.co.uk](mailto:fhi@cefass.co.uk)

Web: [www.efishbusiness.co.uk](http://www.efishbusiness.co.uk)

## *Gyrodactylus salaris* (GS)



Image courtesy Guy Mawle

## Introduction

*Gyrodactylus salaris* (GS) is an external parasite primarily affecting Atlantic salmon in freshwater. GS can occur in high densities resulting in heavy loss of salmon parr and smolts. Although not currently found in the UK, if introduced here it could rapidly spread across the country and dramatically reduce wild salmon stocks.

Disease causing agent: *Gyrodactylus salaris* is a monogenean parasite of the phylum Platyhelminthes.

## Geographical distribution

GS was first reported in Sweden and is believed to occur naturally in Russia and the Baltic regions of Finland, Latvia and Lithuania. The Baltic strain of salmon has a high level of tolerance to infection. However Atlantic salmon are highly susceptible to the parasite.

GS has also been reported in Norway, Denmark and Germany.

## Susceptible species

The main host of GS is the Atlantic salmon, although other salmonids are also susceptible including; rainbow trout, Arctic char, North American brook trout, grayling, North American lake trout and brown trout.



GS infestation on dorsal fin

## Epizootiology & clinical signs



The parasite viewed under an electron microscope

GS is a small worm like organism up to 2mm in length. It attaches to the fins, gills and skin of fish using specially modified hooks. Once attached the parasite feeds by releasing digestive enzymes on to the skin of the fish and then consumes the digested material.

Clinical signs of infection reflect the irritation that the parasite causes to fish. Behavioural changes such as flashing may be observed, with increased mucus production. Skin damage may include ulcers and small lesions, leaving the fish subject to secondary fungal infection.

The parasite can be seen under low magnification. Without magnification, heavily infected fish may have a white or grey appearance due to the extremely high numbers of parasite and possibly excess mucus production. Fungal infections may also be observed.

Experience in Norway has shown when GS is introduced to a new host population, 95% of wild Atlantic salmon parr will be lost within a few years. It is possible a single GS specimen introduced into an unaffected water system would be capable of starting an epidemic. GS has the capability to reproduce and spread very rapidly.

GS can be transmitted on infected fish. Other fish species - such as eels, minnows and sticklebacks - can transport the parasite. It can also survive for several days in damp conditions. Therefore it can be accidentally transported on damp equipment - such as fishing tackle, nets and waders - used in infected waters.

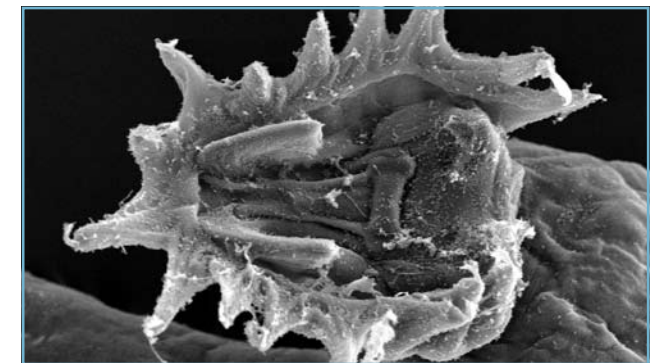
## Treatment and control

The UK is recognised as being GS free and therefore imposes controls on live fish movements from infected countries. Other potential avenues of introduction exist, such as through contaminated angling equipment.

Anglers returning from fishing excursions in countries where GS occurs should thoroughly clean and disinfect all fishing equipment. This kills any parasites and prevents accidental introductions. Countries such as Iceland and Norway may require certification confirming angling equipment disinfection before permitting fishing.

Norway has tried to eradicate GS from infected river systems by chemical means. Chemical treatment is costly, environmentally damaging, only possible under favourable conditions, and has had varying degrees of success. GS cannot survive full strength sea-water, therefore migratory fish will not reintroduce the parasite.

The most effective control on GS is to prevent its introduction into the UK. If GS was found in the UK, control measures would be implemented, including disinfection of farms and fisheries. Movement restrictions would be applied and measures taken to eradicate the disease. All contact sites would be investigated for evidence of disease in order to identify the source and spread of the infection.



The parasite's attachment organ