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The post-treatment surveillance programme for *Gyrodactylus salaris* in Norway 2020

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Authors

Haakon Hansen, Saima Nasrin Mohammad, Hilde Irene Welde, Marit Måsøy Amundsen

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Content

Summary

For 2020, *Gyrodactylus salaris* was not detected in any of the rivers included in the surveillance programme. Ranavassdraget including Tverråga (156.Z) in Nordland County was declared free from *G. salaris* in 2020. Thus, at the end of 2020, the parasite is confirmed present in eight Norwegian rivers.

Introduction

During the period 1975 - 2020, pathogenic strains of *Gyrodactylus salaris* have been detected on Atlantic salmon (*Salmo salar*) fingerlings/parr in 51 rivers, 13 hatcheries/farms with Atlantic salmon parr/smolts and 26 hatcheries/farms with rainbow trout (*Oncorhynchus mykiss*). The latest detection was in 2019, in River Selvikvassdraget, in Vestfold and Telemark County, where infected fish were found on samples analysed in the surveillance program. In addition, both pathogenic and non-pathogenic strains of *G. salaris* have been found on Arctic char (*Salvelinus alpinus*).

The policy of the Norwegian authorities is to eradicate *G. salaris* from infected watersheds and farms (Anon 2014). In farms, this is carried out by eliminating the hosts (Atlantic salmon and rainbow trout). This ensures elimination of the parasite since it lacks specialised free-living stages and does not use intermediate hosts in its life cycle. In rivers, the eradication is done by chemical treatment. In most instances rotenone has been the preferred chemical, but one exception to this is the treatment of River Lærdalselva in 2011-2012, where acidified aluminum sulphate was used to eradicate the parasite.

By 31.12.2020, *G. salaris* was confirmed eradicated from 39 rivers and from all hatcheries/fish farms. In additional four rivers, eradication measures have been completed, but eradication has not yet been confirmed.

Gyrodactylus salaris is a notifiable (List 3) disease in Norway and it is listed under “Fish diseases” by the World Organisation for Animal Health (OIE). Surveillance of *G. salaris*, aiming to declare freedom from the parasite in treated rivers, has been ongoing since the early 1980s. The Norwegian Veterinary Institute (NVI) coordinates the surveillance programme and publishes the overall results in annual reports available on the NVI website (www.vetinst.no).

An adequate surveillance, covering both space and time, is required to ascertain freedom from infection with *G. salaris* in the treated rivers. Declaring a river free from parasites requires examination of salmon juveniles sampled over a time period of a minimum of five years after an eradication measure is completed. This time frame is based on a smolt age of four years, adding one year safety margin. In rivers with higher smolt age, the time to ascertain freedom from infection is increased proportionally.

The NVI is responsible for the sampling in the rivers, but County Environmental Departments and other institutions/companies are commissioned to carry out the actual sampling. The NVI is responsible for both examination of the fish samples and subsequent species identification if specimens of *Gyrodactylus* are detected.

Aims

The post-treatment surveillance programme for *Gyrodactylus salaris* aims to document the absence of the parasite in previously infested rivers after the implementation of eradication measures. This documentation provides the basis for the Norwegian Food Safety Authority to declare the salmon populations free from infection.

Materials and methods

Wild Atlantic salmon juveniles are sampled along the whole anadromous part of the river. The programme recommends sampling of at least 10 salmon juveniles near the river outlet to the sea, and further 10 salmon at every second kilometre, all the way up to the migration barrier in the main river as well as in the tributaries. Thus, the total number of sampled fish is dependent of the length of the anadromous part of the river system. Fingerlings and parr with a preferred size ranging from 7 - 12 cm are caught by means of electrofishing. The fish are killed and then preserved whole in 96 % ethanol.

All samples are sent to the NVI where the whole surface of the fish, including head, gills and fins, is examined under a stereo microscope at 10 - 15 times magnification.

When *Gyrodactylus* specimens are detected, species determination is performed by NVI. NVI is the OIE reference laboratory for "Infection with *Gyrodactylus salaris*" and the methods used for species identification follow those given by the OIE Manual of Diagnostic Tests for Aquatic Animals.
http://www.oie.int/index.php?id=2439&L=0&htmfile=chapitre_gyrodactylus_salaris.htm

Results and discussion

Altogether, 775 salmon juveniles from five watercourses were examined in 2020 (Table 1). *G. salaris* was not detected in any of the rivers.

Ranavassdraget including Tverråga (156.Z) in Nordland County was declared free from *G. salaris* in October 2020, five years after it was treated (Table 2).

***Table 1**: Details of the watercourses and the number of Atlantic salmon (AS) examined for* Gyrodactylus salaris *in 2020.*

County	River	No. of AS examined	Positives
Nordland	Fusta (152.Z)	150	0
Nordland	Ranavassdraget (156.Z)	141	0
Nordland, total		**291**	**0**
Troms and Finnmark	Signaldalselva (204.Z)	240	0
Troms and Finnmark	Kitdalselva (204.8Z)	45	0
Troms and Finnmark	Skibotnelva (205.Z)	199	0
Troms and Finnmark, total		**484**	**0**
Total		**775**	**0**

***Table 2**: The number of Atlantic salmon juveniles from the River Ranavassdraget (156.Z) examined during the post-treatment surveillance programme between 2016 and 2020 (Nordland County).*

Watercourses	Watercourse code	2016	2017	2018	2019	2020	Positives
Ranavassdraget	156.Z	121	140	142	141	141	0
Total all years	**685**						**0**

References

1. Anon (2014). Handlingsplan mot lakseparasitten *Gyrodactylus salaris* for perioden 2014-2016. Miljødirektoratet 2014. 114 s.

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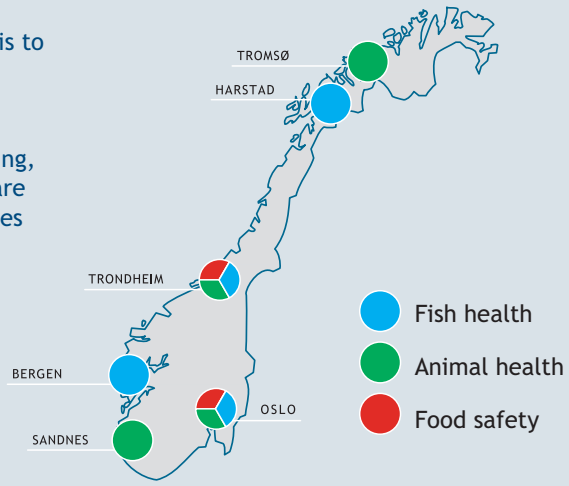

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