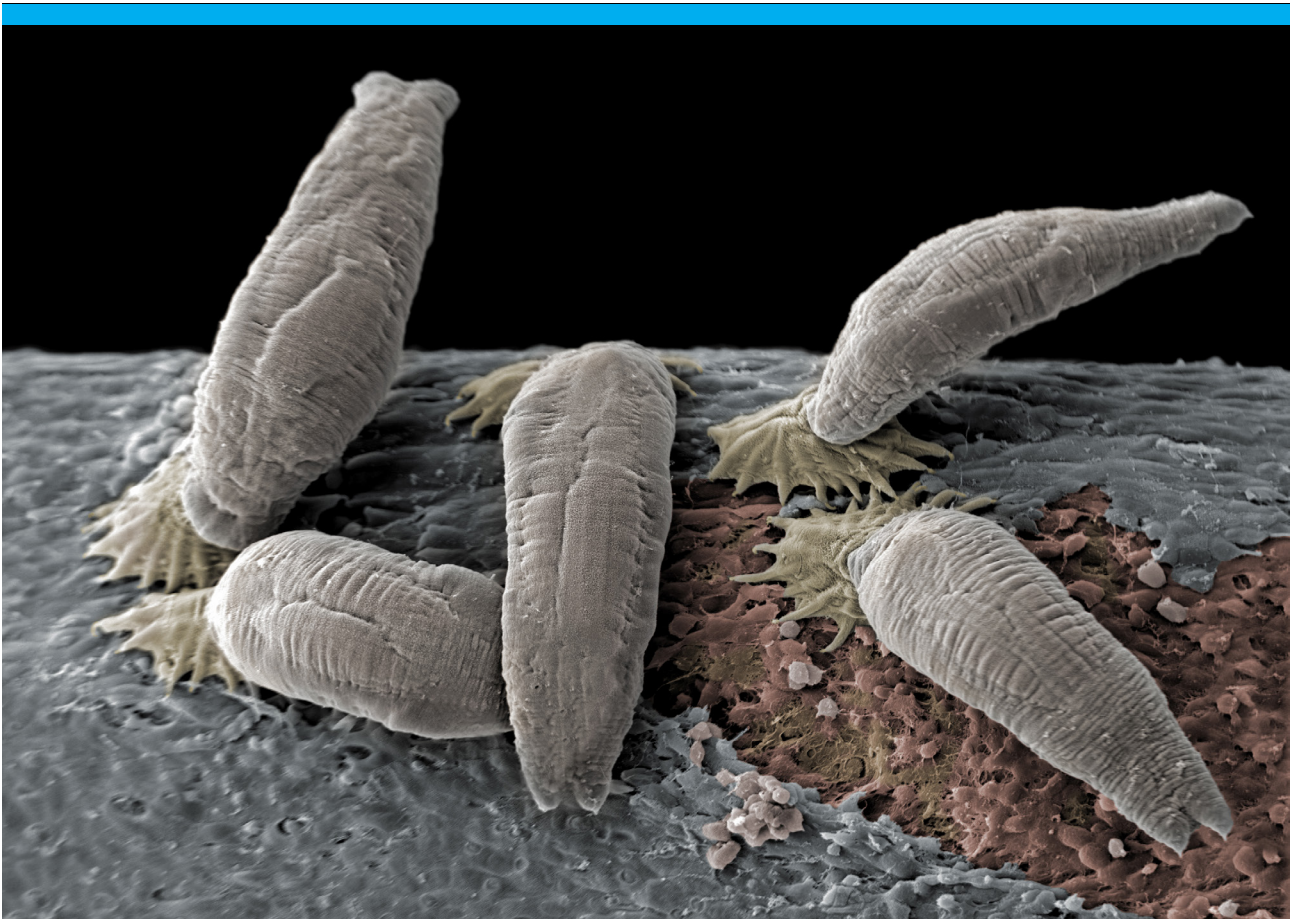


The surveillance programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway 2017



Veterinærinstituttet
Norwegian Veterinary Institute



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Authors

Sigurd Hytterød, Mari Darrud, Karin Johansen, Siw Larsen, Saima Nasrin Mohammad and Haakon Hansen

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Summary

In 2017, *Gyrodactylus salaris* was not detected in any of the rivers or fish farms included in the surveillance programme.

Introduction

During the period of 1975 to 2017, pathogenic strains of *Gyrodactylus salaris* have been detected on Atlantic salmon (*Salmo salar*) fingerlings/parr in 50 rivers, 13 hatcheries/farms with Atlantic salmon parr/smolts and 26 hatcheries/farms with rainbow trout (*Oncorhynchus mykiss*). The latest detection was in 2015, in River Kitdalselva, in Troms County, where infected fish were found during a rotenone treatment. 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 (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 rotenone treatment. One exception is the treatment of River Lærdalselva in 2011-2012, where acidified aluminum sulphate was used to eradicate the parasite.

By December 31st 2017, *G. salaris* was confirmed to be eradicated from 32 rivers and from all hatcheries/fish farms. In additional 11 rivers, eradication measures have been completed, but eradication has not yet been confirmed. Thus, at the end of 2017, the parasite is confirmed present in 7 Norwegian rivers.

G. salaris is a notifiable (List 3) disease in Norway and it is listed as "Other significant disease" 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).

The Norwegian Food Safety Authority is responsible for the sampling in fish farms. The NVI is responsible for the sampling in the rivers, but County Environmental Departments and other institutions/companies are commissioned to do the actual sampling. The NVI is responsible for examination of all the fish samples and the species identification of the parasites if *Gyrodactylus* is detected.

Aims

The surveillance programme aims to document the freedom of *G. salaris* in Norwegian farms and rivers, and to detect and trace any spread of the parasite to new river systems or fish farms (or to rivers and farms declared free from infection).

Materials and methods

The selection of rivers included in the surveillance programme is based on the risk of being infected with *G. salaris*. A total of 30 wild Atlantic salmon juveniles are sampled from each river, preferably from three different sites located far apart. In Tana, 150 salmon are sampled at 15 sites due to the large size of this watercourse. Fingerlings/parr/smolts are caught by means of electrofishing. The fish are killed and then preserved whole in 96% ethanol.

In farms and hatcheries, either 30 Atlantic salmon or 60 rainbow trout are sampled by seine net in each farm. The fish are killed and all fins (except adipose fin) are cut off and preserved in 96% ethanol.

All the samples are sent to the NVI where the samples are examined under a stereo microscope at 10 - 15 times magnification. For wild Atlantic salmon, the whole fish surface including the body, head and fins is examined, while only the fins are examined on farmed fish.

When *Gyrodactylus* specimens are detected, a species determination is performed by the NVI in Oslo, the OIE reference laboratory for the disease. The methods used for species identification follow those in the Gyrodactylosis (*G. salaris*) chapter in the Manual of diagnostic tests for aquatic animals from the World Organisation for Animal Health (OIE).

http://www.oie.int/index.php?id=2439&L=0&htmfile=chapitre_gyrodactylus_salaris.htm

Results and Discussion

Altogether, 2,217 specimens from 69 rivers and 3,615 specimens from 110 farms were examined in 2017 (Table 1).

Table 1. Number of rivers, farms and fish examined for *Gyrodactylus salaris* in 2017.

| County | Rivers | | | | Farms | | | |
|------------------|-----------|-------|----------------------|----------|------------|-------|----------------------|----------|
| | No. | Fish* | No. of fish examined | Positive | No. | Fish* | No. of fish examined | Positive |
| Finmark | 9 | AS | 412 | 0 | 1 | AS | 30 | 0 |
| Troms | 4 | AS | 136 | 0 | 5 | AS | 150 | 0 |
| Nordland | 8 | AS | 242 | 0 | 11 | AS | 334 | 0 |
| Nord-Trøndelag | 6 | AS | 189 | 0 | 7 | AS | 208 | 0 |
| Sør-Trøndelag | 4 | AS | 122 | 0 | 12 | AS/RT | 395 | 0 |
| Møre og Romsdal | 15 | AS | 405 | 0 | 25 | AS/RT | 814 | 0 |
| Sogn og Fjordane | 4 | AS | 125 | 0 | 11 | AS/RT | 435 | 0 |
| Hordaland | 1 | AS | 31 | 0 | 22 | AS/RT | 709 | 0 |
| Rogaland | 3 | AS | 108 | 0 | 8 | AS | 304 | 0 |
| Vest-Agder | 4 | AS | 76 | 0 | 0 | - | - | - |
| Aust-Agder | 0 | - | - | - | 0 | - | - | - |
| Telemark | 0 | - | - | - | 2 | AS | 62 | 0 |
| Vestfold | 2 | AS | 72 | 0 | 0 | - | - | - |
| Buskerud | 2 | AS | 70 | 0 | 2 | AS | 64 | 0 |
| Oppland | 0 | - | - | - | 3 | RT | 80 | 0 |
| Oslo | 2 | AS | 71 | 0 | 0 | - | - | - |
| Akershus | 3 | AS | 109 | 0 | 0 | - | - | - |
| Østfold | 2 | AS | 49 | 0 | 1 | AS | 30 | 0 |
| Total | 69 | | 2 217 | 0 | 110 | | 3 615 | 0 |

* AS = Atlantic salmon, RT = rainbow trout.

In 2017, *G. salaris* was not detected in any of the rivers or fish farms included in the surveillance program.

References

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

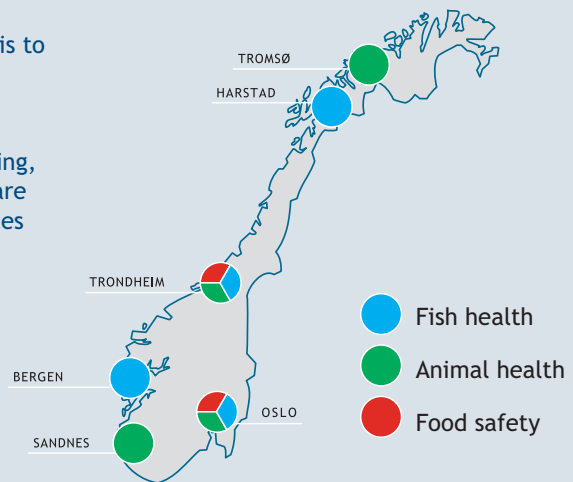
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Oslo
postmottak@vetinst.no

Trondheim
vit@vetinst.no

Sandnes
vis@vetinst.no

Bergen
post.vib@vetinst.no

Harstad
vih@vetinst.no

Tromsø
vitr@vetinst.no

www.vetinst.no



Veterinærinstituttet
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