

The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway 2011

Cecilie Sviland

Haakon Hansen

Tor Atle Mo

Asle Moen

Britt Bang Jensen



Surveillance and control programmes for terrestrial and aquatic animals in Norway

Annual report 2011

Project managers at the Norwegian Veterinary Institute:
Ståle Sviland and Hege Hellberg

Publisher

Norwegian Veterinary Institute
PO Box 750 Sentrum
N-0106 Oslo
Norway

Fax: + 47 23 21 60 01

Tel: + 47 23 21 60 00

E-mail: postmottak@vetinst.no

www.vetinst.no

ISSN 1890-9973

Title:

The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway 2011

Authors:

Cecilie Sviland, Haakon Hansen, Tor Atle Mo, Asle Moen, Britt Bang Jensen

Date: 6th March 2012

Front page photo: Colourbox

Any use of the present data should include specific reference to this report.

Example of citation:

Sviland C, Hansen H, Mo TA, Moen A, Jensen BB. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway 2011. *Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2011*. Oslo: Norwegian Veterinary Institute 2012

The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway 2011

Cecilie Sviland, Haakon Hansen, Tor Atle Mo, Asle Moen, Britt Bang Jensen

In 2011, Gyrodactylus salaris reappeared in one salmon river. No Atlantic salmon or rainbow trout farms were found infected.

Introduction

During the period of 1975 to 2010 pathogenic strains of *Gyrodactylus salaris* have been detected on Atlantic salmon (*Salmo salar*) fingerlings/parr in 48 rivers, 13 hatcheries/farms with Atlantic salmon parr/smolt and 26 hatcheries/farms with rainbow trout (*Oncorhynchus mykiss*). In addition, a non-pathogenic strain of *G. salaris* has been found on Arctic charr (*Salvelinus alpinus*) in several lakes. The policy of the Norwegian Authorities is to eradicate *G. salaris* from infected rivers and farms. In farms, the eradication procedure is carried out by eliminating the hosts (salmon and rainbow trout) and thereby eliminating the parasite because it lacks specialized free-living stages and do not need intermediate hosts in its life-cycle. In rivers, the eradication procedure is carried out by treatment with rotenone, a poison that kills all the fish hosts. In addition, the use of acidified aluminium sulphate is under development. In contrast to rotenone, aluminium sulphate will kill the parasite but not the fish host. By December 31 2011, *G. salaris* was confirmed eradicated from 20 rivers and from all hatcheries/fish farms. The eradication has not yet been confirmed for three additional rivers. Thus, at the end of 2011, the parasite was present or suspected to be present in 25 Norwegian rivers.

G. salaris is a notifiable (List 3) disease in Norway and it is listed as "Other significant disease" in the World Organisation for Animal Health (OIE). Surveillance of *G. salaris* has been performed in Norwegian salmon rivers since late 1970s (1, 2, 3, 4, 5, 6, 7, 8, 9,10). Surveillance is not performed in infected rivers or farms.

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

Aim

The surveillance programme aims to detect and trace any spread of *Gyrodactylus salaris* to new river systems or fish farms (or to rivers and farms cleared of infection).

Materials and methods

At least 30 wild Atlantic salmon are sampled from each river. Fingerlings/parr/smolts are caught by means of electrofishing. In some of the large rivers, sampling is done at different locations far apart. The fish are killed and then preserved as whole in 96 % ethanol. At least 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 National Veterinary Institute in Harstad where the samples are examined under a stereo microscope at 10 - 15 times magnification. The whole surface including body, head and fins are examined for wild Atlantic salmon while fins only are examined for farmed fish.

When *Gyrodactylus* specimens are found, these are sent to the National Veterinary Institute in Oslo (the OIE reference laboratory for the disease) for species determination. The methods used for species identification follows those in the Gyrodactylosis (*Gyrodactylus salaris*) chapter in the Manual of diagnostic tests for aquatic animals from the World Organisation for Animal Health (OIE) (http://www.oie.int/fileadmin/Home/eng/Health_standards/aahm/2010/2.3.03_Gyrodactylosis.pdf).

Results

Altogether, 3,783 specimens from 112 rivers and 3,106 specimens from 93 farms were examined in 2011 (Tables 1 and 2). One new infection with *G. salaris* was detected in samples from the river Måna, which is included in the surveillance program. There were no new infections with *G. salaris* detected in any farm in samples included in the surveillance program.

Conclusion

During 2011, *G. salaris* reappeared in one river within a region with several other infected rivers.

Table 1. Number of rivers and number of fish examined for *Gyrodactylus salaris* in 2011

County	No. of rivers	Species	No. of fish examined	Detections
Finnmark	9	Atlantic salmon	510	0
Troms	7	Atlantic salmon	240	0
Nordland	13	Atlantic salmon	404	0
Nord-Trøndelag	11	Atlantic salmon	318	0
Sør-Trøndelag	7	Atlantic salmon	213	0
Møre og Romsdal	23	Atlantic salmon	742	1
Sogn og Fjordane	13	Atlantic salmon	458	0
Hordaland	3	Atlantic salmon	91	0
Rogaland	7	Atlantic salmon	210	0
Vest-Agder	5	Atlantic salmon	186	0
Aust-Agder	2	Atlantic salmon	63	0
Telemark	2	Atlantic salmon	80	0
Vestfold	3	Atlantic salmon	135	0
Buskerud	1	Atlantic salmon	12	0
Oslo	1	Atlantic salmon	12	0
Akershus	3	Atlantic salmon	46	0
Østfold	2	Atlantic salmon	63	0
Total	112		3783	1

Table 2. Number of fish farms and number of fish examined for *Gyrodactylus salaris* in 2011

County	No. of farms	Species	No. of fish examined	Detections
Troms	6	Atlantic salmon	180	0
Nordland	12	Atlantic salmon	360	0
Nord-Trøndelag	1	Atlantic salmon	30	0
Sør-Trøndelag	14	Atlantic salmon, rainbow trout	547	0
Møre og Romsdal	14	Atlantic salmon, rainbow trout	452	0
Sogn og Fjordane	11	Atlantic salmon, rainbow trout	409	0
Hordaland	24	Atlantic salmon, rainbow trout	798	0
Rogaland	7	Atlantic salmon	210	0
Oppland	4	Rainbow trout	120	0
Total	93		3106	0

References

1. Mo TA, Norheim K. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. In: Fredriksen B, Mørk T (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2001. Oslo: National Veterinary Institute; 2002. p. 155-9.
2. Mo TA, Norheim K. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. In: Heier BT (editor). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2002. Oslo: National Veterinary Institute; 2003. p. 137-41.
3. Mo TA, Norheim K. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. In: Mørk T, Hellberg H (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2003. Oslo: National Veterinary Institute; 2004. p. 135-7.
4. Mo TA, Norheim K. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. In: Mørk T, Hellberg H (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2004. Oslo: National Veterinary Institute; 2005. p. 137-9.
5. Mo TA, Norheim K. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. In: Brun E, Hellberg H, Mørk T, Jordsmyr HM (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2005. Oslo: National Veterinary Institute; 2006. p. 134-7.
6. Mo TA, Norheim K, Jansen PA. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. In: Brun E, Hellberg H, Mørk T, Jordsmyr HM (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2006. Oslo: National Veterinary Institute; 2007. p. 143-5.
7. Mo TA, Norheim K, Jansen PA. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. In: Brun E, Jordsmyr HM, Hellberg H, Mørk T (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2007. Oslo: National Veterinary Institute; 2008. p. 145-8.
8. Mo TA, Kristensen A-M, Norheim K, Jansen PA. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. Annual report 2008. In: Brun E, Jordsmyr HM, Hellberg H, Mørk T (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Oslo: National Veterinary Institute; 2010.
9. Mo TA, Kristensen A-M, Hansen H, Norheim K, Jensen BB. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. Annual report 2009. In: Karlsson A-C, Jordsmyr HM, Hellberg H, Sviland S (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Oslo: National Veterinary Institute; 2010.
10. Hansen H, Norheim K, Mo TA, Jensen BB. The surveillance and control programme for *Gyrodactylus salaris* in Atlantic salmon and rainbow trout in Norway. In: Sviland S, Hellberg H (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2010. Oslo: Norwegian Veterinary Institute; 2011. ISSN 1503-1454.

The Norwegian Veterinary Institute (NVI) is a nationwide research institute in the fields of animal health, fish health, and food safety. The primary mission of the NVI is to give research-based independent advisory support to ministries and governing authorities. Preparedness, diagnostics, surveillance, reference functions, risk assessments, and advisory and educational functions are the most important areas of operation.

The Norwegian Veterinary Institute has its main laboratory in Oslo, with regional laboratories in Sandnes, Bergen, Trondheim, Harstad og Tromsø, with about 360 employees in total.

www.vetinst.no



Veterinærinstituttet
Norwegian Veterinary Institute

The Norwegian Food Safety Authority (NFSA) is a governmental body whose aim is to ensure through regulations and controls that food and drinking water are as safe and healthy as possible for consumers and to promote plant, fish and animal health and ethical farming of fish and animals. We encourage environmentally friendly production and we also regulate and control cosmetics, veterinary medicines and animal health personnel. The NFSA drafts and provides information on legislation, performs risk-based inspections, monitors food safety, plant, fish and animal health, draws up contingency plans and provides updates on developments in our field of competence.

The NFSA comprises three administrative levels, and has some 1300 employees.

The NFSA advises and reports to the Ministry of Agriculture and Food, the Ministry of Fisheries and Coastal Affairs and the Ministry of Health and Care Services.

www.mattilsynet.no

