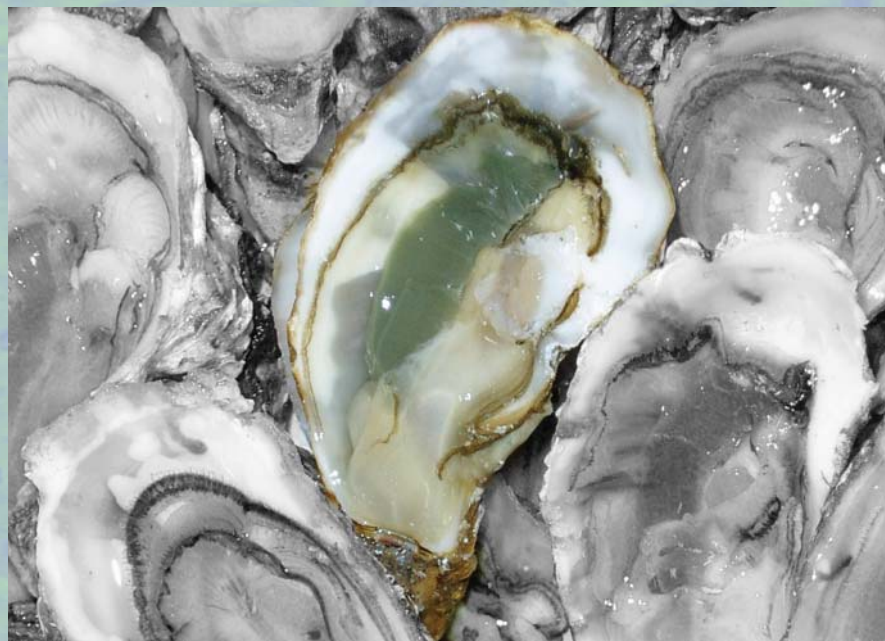


The surveillance and control programme
for bonamiosis and marteiliosis in
European flat oysters (*Ostrea edulis* L.)
in Norway

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Surveillance and control programmes for terrestrial and aquatic animals in Norway.
Annual report 2010

Editors

Ståle Sviland and Hege Hellberg

Publisher

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Front page photo: Hege Hellberg

ISSN 1503-1454

Example of citation:

Hellberg H, Medhus A, Hansen H, Fineid B. The surveillance and control programme for Bonamiosis and Marteilliosis in European flat oysters (*Ostrea edulis* L.) and the blue mussel (*Mytilus edulis* L.) 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.

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The surveillance and control programme for Bonamiosis and Marteilliosis in European flat oysters (*Ostrea edulis* L.) and the blue mussel (*Mytilus edulis* L.) in Norway

Hege Hellberg, Agathe Medhus, Haakon Hansen, Birgitte Fineid

Marteilia refringens and *Bonamia ostreae* were not observed in samples tested in 2010.

Introduction

The protozoan parasites *Bonamia ostreae* and *Marteilia refringens* have been identified as the main threats to commercial flat oyster production in Europe, and bonamiosis and marteilliosis are classified as List II diseases by the European Union (1). In 2004 Norway was recognized as an approved zone with regard to *B. ostreae* and *M. refringens* (2). *Bonamia ostreae* was detected in samples from a wild flat oyster population in Arendal in 2008 (3). The Norwegian Food Safety Authority (NFSA) established a control zone to prevent further spread of the pathogen (4). Results indicated that the prevalence and intensity of infection was very low level and increased mortality has not been reported. The blue mussel is a susceptible species for marteilliosis and the parasite has been detected in these mussels in Sweden. Blue mussels were included in the Norwegian surveillance programme in 2010. The Norwegian Veterinary Institute has more information on bonamiosis and marteilliosis at the following web addresses:

<http://www.vetinst.no/nor/Faktabank/Alle-faktaark/Bonamia-og-bonamiose>

<http://www.vetinst.no/nor/Faktabank/Alle-faktaark/Marteilliose>

<http://www.vetinst.no/eng/Research/Publications/Surveillance-and-Control-Programs-annual-reports>

Aim

The aim of the programme is to document the health status of Norwegian flat oysters regarding *Bonamia ostreae* and *Marteilia refringens* and blue mussels regarding *M. refringens*.

Materials and methods

Sampling

Sampling and inspection is carried out by the Norwegian Food Safety Authority District Offices according to Directive 2006/88/EC and Decision 2002/878/EC (1, 5). All samples are shipped live to the Norwegian Veterinary Institute in Bergen for analysis.

Three sites are included in the oyster surveillance while an additional site is included for the blue mussel surveillance. For the general surveillance programme 30 samples are taken from each site twice a year. In case of extended surveillance the sample size is extended to 150 twice a year. The sample plan is summarized in table 1.

Table 1. Sampling plan for 2010

Sample site	Oyster			Mussel		
	Spring	Autumn	Total	Spring	Autumn	Total
Østfold*	-	-	-	30	30	60
Vestfold**	30	30	60	30	30	60
Aust-Agder	150	150	300	30	30	60
Hordaland	30	30	60	30	30	60
Total	210	210	420	120	120	240

Analysis

Oysters and mussels are prepared for histological examination and analysed according to the current edition of OIE "Manual of Diagnostic Tests for Aquatic Animals" (6). In addition, selected gills samples from oysters may be analysed by real-time PCR for the presence of *B. ostreae* (7). Putative positive samples are referred to the EU Community Reference Laboratory for mollusc disease in La Tremblade, France for confirmative analysis.

Results

In 2010, a total of 374 oysters from four sites (Table 1) were examined by histology. In addition, real time PCR was performed on selected samples from Hordaland and Vestfold. *Marteilia refringens* and *B. ostreae* were not observed. A total of 150 mussels were examined by histology. *Marteilia refringens* was not detected. Apart from losses due to low water temperatures and ice, there have been no reports on increased mortality in the sampled populations in 2010.

Table 2. Number of oysters and mussels per sample site tested for bonamiosis and marteiliosis in 2010. A total of 3 out of 3 oyster sites were sampled for and 3 out of 4 mussel sites were sampled.

Sample site	Oyster			Mussel		
	Spring	Autumn	Total	Spring	Autumn	Total
Østfold*	-	-	-	30	30	60
Vestfold**	17	30	47	-	-	-
Aust-Agder	144	123	267	30	30	60
Hordaland	30	30	60	-	30	30
Total	191	183	374	60	90	150

* Only sampled for mussels. ** No mussels received in 2010.

Discussion

Bonamia ostreae and *Marteilia refringens* were not detected in samples analysed in the surveillance and control programme for bonamiosis and marteiliosis in 2010. These results are supported by research from other institutions (8)

Infections with *B.ostreae* can persist in wild oyster populations at very low prevalence without causing disease outbreaks or increased mortality (9). A sample size of 30 gives a 95 % probability for detecting a prevalence of at least 10 % in an infected population under the assumption of a 100% sensitive test, while a sample size of 150 gives a 95 % probability for detecting a prevalence of at least 2% in an infected population. Based on the results of the 2009 and 2010 analyses, the possibility of an infection with *B. ostreae* in the Arendal wild flat oyster population cannot be excluded, but the prevalence could be very low (probably < 2 %).

References

1. Council Directive 2006/88/EC of 24 October 2006 on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals.
2. EFTA Surveillance Authority Decision No. 225/04/COL of 9 September 2004.
3. Hellberg H, Aakvik K. The surveillance and control programme for bonamiosis and marteiliosis in European flat oysters (*Ostrea edulis* L.) in Norway. In: Brun E, Jordsmyr HM, Hellberg H, Sviland S (editors). Surveillance and control programmes for terrestrial and aquatic animals in Norway. Annual report 2008. Oslo: National Veterinary Institute; 2010.
4. NFSA Regulation FOR 2009-06-15 nr 648: Forskrift om kontrollområde for forebygging, begrensning og utrydding av østerssykdommen Bonamiose, Risør, Tvedestrand, Arendal, Grimstad og Lillesand kommuner, Aust-Agder
5. Commission Decision 2002/878/EC of 6 November 2002 establishing the sampling plans and diagnostic methods for the detection and confirmation of the mollusc diseases Bonamiosis (*Bonamia ostreae*) and Marteiliosis (*Marteilia refringens*).
6. Anonymous. Diseases of Molluscs. In: "Manual of Diagnostic Tests for Aquatic Animals 2010". Part 2, Paris: Office International des Epizooties; 2010.
7. Robert M, Garcia C, Chollet B, Lopez-Flores I, Ferrand S, Francois C, Joly JP & Arzul I. Molecular detection and quantification of the protozoan *Bonamia ostreae* in the flat oyster, *Ostrea edulis*. Molecular and Cellular Probes, 2009; 23: 264-271.
8. Mortensen S, Skår C K, Harkestad L S, Einen A C B, Jelmert A. Finnes det bonamiose i norske bestander av flatøsters, *Ostrea edulis*? Norsk Veterinærtidsskrift 2011; 2: 67-73.
9. Narcisi V, Arzul I, Cargini D, Mosca F, Calzetta A, Traversa D, Robert M, Joly J P, Chollet B, Renault T, Tiscar P G. Detection of *Bonamia ostreae* and *B. exitiosa* (Haplosporidia) in *Ostrea edulis* from the Adriatic Sea (Italy). Diseases of Aquatic Organisms, 2010; 89: 79-85.

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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.

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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.

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