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

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Marteilia refringens *were not observed in any of the samples tested in the 2008 surveillance.* **Bonamia ostreae** *was however, detected in samples from a wild population from Aust-Agder. This is the first diagnosis of bonamiosis in Norway.*

Introduction

The protozoan parasites *Bonamia ostreae* and *Marteilia refringens* are identified as the main threats to commercial flat oyster production in Europe (1, 2, 3). Bonamiosis and marteiliosis are classified as List II by both the European Union and Norway. In 2004, Norway was recognized as an approved zone with regard to *B. ostreae* and *M. refringens* (4).

Aim

The surveillance programme was introduced in order to describe the health status of Norwegian flat oysters and as a measure to maintain Norway's status as an approved zone free from *Bonamia ostreae* and *Marteilia refringens*.

Materials and methods

Sampling

Sampling and inspection is carried out by the Norwegian Food Safety Authority District Offices according to Directive 91/67/EEC and Decision 2002/878/EC (5, 6). Thirty to 150 oysters are sampled from each site spring and autumn and shipped live to the National Veterinary Institute in Bergen for analysis.

Analysis

Oysters are prepared for histological examination according to the current edition of OIE "Manual of Diagnostic Tests for Aquatic Animals" (7). In addition, gills are sampled for molecular biology and stored at –70 º C. Putative positive samples are referred to EU Community Reference Laboratory for mollusc disease in La Tremblade, France for confirmative analysis.

Results

In 2008, a total of 222 oysters from four sites (Table 1) were examined. *Marteilia refringens* was not observed. In the autumn-samples from a wild population in Aust-Agder, small spherical or ovoid structures (2-5 µm wide) were observed within haemocytes in several individuals. Stained sections, paraffin embedded blocks and frozen gill tissue from nine oysters were sent to the "Community Reference Laboratory for Diseases of Bivalve Molluscs" (IFREMER) in France for additional testing. Histological examination, *In Situ* Hybridization (ISH) and polymerase chain reaction (PCR) was performed on the material in accordance with Decision 2002/878/EC (6). *B. ostreae* was identified by histology and PCR in one and by PCR in another individual. Sequencing of PCR-product presented 100 % identity with *B. ostreae* actin gene. ISH did not yield a signal. Prevalence has not yet been established. There has been no reports on increased mortality in the affected population in 2008.

Table 1. Number of oysters per sample site tested for bonamiosis and marteiliosis in 2008

Sample site	Spring 2008	Autumn 2008	Total 2008
Vestfold	30	30	60
Aust-Agder	40	50	90
Hordaland	30	30	60
Hordaland	12	-	12
Total: 4	**112**	**110**	**222**

Discussion

In 2007, *Bonamia*-like structures were observed in samples from Aust-Agder and samples referred to EU reference laboratory for ISH and PCR, *B. ostreae* was not detected (8). However, a recommendation was given to increase the sample size from the population in question. In 2008, sampling was increased to 40 individuals in spring and 50 in the autumn and *B.ostreae* was identified by light microscopy and PCR. The lack of signal by *in situ* hybridization might indicate that infection is very low.

The detection of *B. ostreae* has caused a suspension of the disease free status as regards bonamiosis, and the Food Safety Authority has initiated measures to prevent further spread.

Based on the examinations carried out in the surveillance and control programme for bonamiosis and marteiliosis at the National Veterinary Institute in 2008, no suspected or confirmed cases of marteiliosis were registered within the approved zone.

References

1. Steins NA. *Ostrea edulis* in crisis. ESSFiN Concerted Action Workshop 2 Northern Waters, Aarhus, Denmark. 1997.

2. Grizel H. *Marteilia refringens* and oyster disease - recent observations. Mar Fish Rev 1979; 41: 38-9.

3. Pichot Y, Comps M, Tige G, Grizel H, Rabouin M-A. Recherches sur *Bonamia ostreae* gen. n., sp. n., parasite nouveau de l'huitre plate *Ostrea edulis* [Studies on *Bonamia ostreae* gen. n., sp. n., a new parasite of the European flat oyster, *Ostrea edulis* L., Fr]. Rev Trav Inst Pêch Marit 1981; 43: 131-40.

4. EFTA Surveillance Authority Decision No. 225/04/COL of 9 September 2004.

5. Council Directive 91/67/EEC concerning the health conditions governing the placing on the market of aquaculture animals and products.

6. 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*).

7. Anonymous. Diseases of Molluscs. In: "Manual of Diagnostic Tests for Aquatic Animals – 2006". part 2,. Paris: World Organisation for Animal Health.

8. Hellberg H, Hopkins KA. 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 2007. Oslo: National Veterinary Institute; 2008. p. 155-158.

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The National 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 Affaires and the Ministry of Health and Care Services.

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