

Marteiliosis

Overview

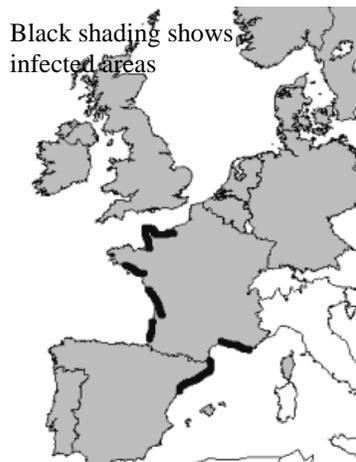
- Outbreaks occur mainly during the summer as water temperatures increase
- Can cause economic losses in shellfish
- No treatment
- Notifiable disease in the UK
- Known to be widespread in continental Europe

Introduction:

Marteiliosis, also known as Aber disease, is a disease caused by *Marteilia refringens* affecting both wild and cultivated native oysters (*Ostrea edulis*). In Europe the first report of the disease was in France in 1967. It has not been identified in oysters within the UK to date.

Geographical distribution:

M. refringens has caused mortalities in *Ostrea edulis* (native oyster) in France, Portugal, Spain, Italy, Greece and Morocco. *M. refringens* has not been isolated within the UK, and is not believed to be present in our native oyster stocks.



Susceptible species:

Marteilia species affect a wide range of shellfish. *M. refringens* has been isolated in *O. edulis*, *Mytilus edulis*, (blue mussels) *Mytilus galloprovincialis* (Mediterranean mussels) and *Crassostrea gigas* (Pacific oysters)

Experimentally *O. angasi* (Australian flat oyster), *O. puelchana* (Argentinean oyster) and *Tiostrea chilensis* (New Zealand dredge oyster) have all been infected.

Epizootiology and Clinical Signs:

M. refringens is a protistan parasite belonging to the paramyxean group affecting the epithelial cells of the gut or gills of *O. edulis* causing the disease known as Marteiliosis.

The complex life cycle begins with an initial infection of the epithelial cells of the gills where the parasite then migrates to the digestive-gland epithelium and onto the gut lumen before being released. Infected oysters may shed large numbers of parasite before they die.

The development of the disease is related to water temperature and in France mortalities in infected stocks start in the early summer as the water temperature rises, peak in August and decrease over the winter as the water temperature drops.

In France the mortalities coincide with seasonal changes; Marteiliosis begins in May and peaks between June and August, after which there is a decrease over the winter months and the parasite then remains quiescent from February to April. However in Dutch waters oyster stocks remain unaffected despite the presence of *M. refringens*. To date the absence of mortalities in these shellfish is unexplained.

Whilst the exact mode of infection of *M. refringens* is unknown, it is thought it may be transmitted horizontally from infected shellfish through the water column, and taken up passively across the gills of susceptible stock. However, there is no experimental evidence to support direct horizontal transmission of *M. refringens*, and alternate theories suggest that intermediate hosts, or free-living stages, may be part of the parasites life cycle. Recent studies have implicated free living copepods in the transmission of the parasite to oysters.

Diagnosis:

Diagnosis of infected oysters is made by histology, cytology or molecular techniques. Histological examination of epithelia of the stomach, intestine, digestive tubules, tract, and the lumen of the intestine will show the presence of *M. refringens* in infected oysters

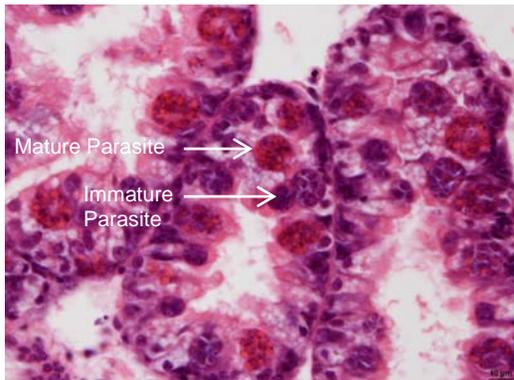
Cytological examination can be carried out by the use of imprints. Smears of the digestive gland are fixed, stained and examined microscopically. Molecular techniques such as Polymerase Chain Reaction (PCR) may also be used to confirm the identification of *M. refringens*.

To obtain a definitive result a combination of two tests is used by Cefas. Initially, histological examination is used to scan material for *Marteilia* spp. if this reveals the presence of *Marteilia* spp. then a PCR test is implemented to confirm the species.

Disease signs:

Clinical signs may include dead and weakened gaping oysters. Visceral tissue within the oyster may become pale in colour and in some instances the mantle can become translucent. In highly infected oysters the infected tissue may appear shrunken and slimy.

However these clinical signs are indicative of many shellfish diseases, and histopathological or PCR analysis should be used to confirm the presence of the parasite.



Digestive tubules of an oyster showing both immature and mature *Marteilia* parasites

Treatment, Control

No treatment has proven effective in controlling Marteiliosis and the only effective measure is the prevention of infection. Within the UK there are import restrictions in place in order to reduce the risk of infection entering the country via infected oysters.

Marteilia infects a number of bivalve species with *O. edulis* (native oyster) being the species of commercial importance.

References:

Fish Diseases and Disorders: Vol 1 Protozoan and Metazoan Infections, 2nd Edition by P.T.K. Woo

http://www.oie.int/eng/normes/fmanual/A_00035.htm