

Sporulating *Haplosporidium nelsoni* in *Crassostrea gigas* in a production bay in Ireland

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Abstract

This report describes the finding of *Haplosporidium nelsoni* DNA in cohorts of *Crassostrea gigas* oysters analysed during reoccurring mortality events between 2008 and 2014 in one production bay in SW Ireland (Castlemaine harbour). OsHV-1 μ Var is considered endemic in this bay and *Vibrio aestuarianus* has been detected since 2006. *H. nelsoni* DNA was detected by PCR in 43 out of 172 oysters and included the finding by histology and *in situ* hybridisation of one oyster with sporulating *H. nelsoni* in the digestive tubule epithelium. This is the first detection of the parasite in this bay and the first observation of a systemic infection with *H. nelsoni* in Ireland. Although *H. nelsoni* does not cause disease in *C. gigas* results from a PCR survey indicated that oysters of all age classes examined over a 7 year period were positive for *H. nelsoni* DNA and might suggest that *H. nelsoni* is more common in the environment in this bay than previously thought.

Introduction

The Irish *Crassostrea gigas* industry relies heavily on imports of spat sourced primarily from France. This reliance has been identified as the likely route of introductions of disease agents such as micro-variants of OsHV-1 (Peeler et al., 2012) and may also be responsible for the introduction of *Vibrio aestuarianus* and *Haplosporidium nelsoni*. In Ireland, OsHV-1 μ Var is considered endemic in 35 of the 43 bays in which *C. gigas* oysters are cultured (Declaration from Ireland for disease-free status for Ostreid herpesvirus (OsHV-1 μ Var) for six compartments, 2015). This report concentrates on Castlemaine harbour in the SW of Ireland where market sized oysters are produced.

This bay has experienced significant mortality

episodes since 2006. Over that period mortalities have occurred almost annually between June and late October and have affected all age classes with reported levels ranging from as low as 10% above background, to up to 100%. OsHV-1 μ Var is now considered endemic in the bay and is consistently detected by PCR in spat and juvenile oysters sampled during mortality episodes when sea water temperature exceeds 16 °C (Clegg et al., 2014; Morrissey et al., 2015). In addition, *Vibrio aestuarianus* has been consistently detected in oysters undergoing mortality in this bay (McCleary and Henshilwood, 2015). In July 2013, reports of mortality affecting all age classes of oysters from spat to adult were received from operators in Castlemaine harbour. Reported mortality levels ranged from 20 to 100%. Thirty randomly selected *C. gigas* oysters

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