

# Prevalence of the protozoan parasite *Haplosporidium nelsoni* in the eastern oyster, *Crassostrea virginica*, within the Damariscotta River Estuary, in Maine, USA, in 2014 and 2016 as measured by PCR

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## Abstract

*Haplosporidium nelsoni* is a protozoan parasite that causes a devastating disease in the Eastern oyster, *Crassostrea virginica*, along the East coast of North America. Until recently, *H. nelsoni* had not reached epizootic levels in Maine. However, in the summer of 2010, this parasite was responsible for significant mortalities among cultivated oysters in the Damariscotta River Estuary. In 2011 the commercial oyster industry began using the NEH MSX-resistant strain.

This study investigated the prevalence of *H. nelsoni* in both natural-bed and commercial oyster sites located in the Damariscotta River Estuary in the summer of 2014 and 2016 using a PCR-based assay specific for the parasite. Oysters were sampled from each site at various timepoints. Positive PCRs were noted in up to 53% of animals sampled at a particular site and timepoint. *H. nelsoni* was noted at every site but prevalence was generally lower than previously reported.

The results indicate that the switch from a MSX susceptible strain of oysters to an MSX tolerant/resistant strain has reduced the prevalence of the parasite compared to our previous survey, if not significantly, but that the parasite is still present in both cultivated and natural bed populations.

## Introduction

The Eastern oyster, *Crassostrea virginica*, constitutes an important commercial fishery along the East coast of North America. In this area, consumer demand has permitted the development of a thriving oyster aquaculture industry. About 70% of the total production of harvested oysters in Maine, USA came from the Damariscotta River Estuary in 2010 (D.M.R., 2010).

Unfortunately, disease issues have become a major concern to the industry. One particular disease affecting the eastern oyster is known as MSX (multinucleated sphere unknown) and is caused by the protozoan parasite, *Haplosporidium nelsoni*. *H. nelsoni* has shown devastating effects on cultured and wild oysters, killing 90-95% of the oysters it infects (Haskin and Andrews 1988).

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