

# Haplosporidium nelsoni and Haplosporidium americanum, in the Pacific oyster, *Crassostrea gigas*, and the European flat oyster, *Ostrea edulis*, in Ireland

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Fig. 1. The European flat oyster *Ostrea edulis*



Fig. 2. The Pacific oyster *Crassostrea gigas*

## Background

Haplosporidian parasites have caused significant mortalities in commercially important shellfish species worldwide (Ford and Haskin, 1982; Burreson et al., 2000; Burreson and Reece, 2006). *Haplosporidium nelsoni* is the disease agent of the highly pathogenic Multinucleate Sphere X (MSX) disease in the eastern oyster, *Crassostrea virginica*. The Pacific oyster *Crassostrea gigas* is thought to be resistant to this disease but reports of *H. nelsoni* in this species have taken place. The Olympia oyster, *Ostrea conchaphilla*, is thought to be a possible host species for this pathogen. To date, *H. nelsoni* has been detected in North America, the Gulf of Mexico ranging from Florida to as far south as Venezuela, in Canada, Japan, Korea, more recently in China and in Europe it has been reported in *C. gigas* in France. *Haplosporidium americanum* is another member of the phylum haplosporidia. Unlike *H. nelsoni* it is not known to have had a detrimental effect on oyster populations and production. *H. americanum* is found in Europe (Netherlands and Spain). This study is the first reporting of *H. nelsoni* and *H. americanum* in oysters in Ireland.

## Materials and Methods

- *Crassostrea gigas* (n=556) and *Ostrea edulis* (n=895) were screened for a variety of pathologies and pathogens from two sites (Cork harbour, Co. Cork and Lough Foyle, Co. Donegal).
- Both histology and cPCR were carried out on all oyster samples.



Fig. 3 Map of Ireland showing Cork Harbour and Lough Foyle.

## Results

- During the screening of heart smears, *H. nelsoni*-like plasmodia were observed in one *C. gigas* (0.17%) and in one *O. edulis* (0.11%).
- *H. americanum*-like microcells were observed in one heart smear from *O. edulis* (0.11%).
- In the PCR using generic and specific primers for *H. nelsoni* (Renault et al., 2000) products were amplified at the expected size in each corresponding oyster and in the shell cavity fluid of another *C. gigas*.
- DNA was isolated, purified and sequenced. Sequencing confirmed the DNA to be *H. nelsoni* (Accession # U19538.2, AB080597.1, X74131.1) and *H. americanum* (Accession # AY781176).

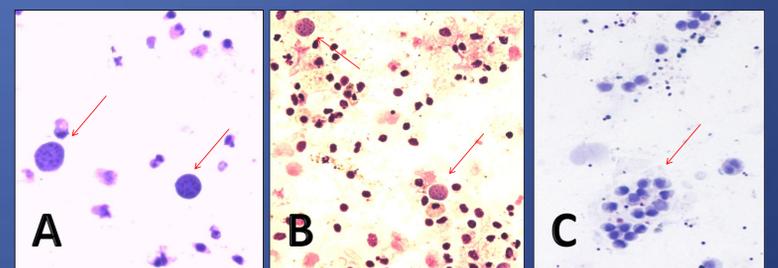


Fig. 4. A *H. nelsoni*-like plasmodia in *C. gigas* heart smear (x40)  
B *H. nelsoni*-like plasmodia in *O. edulis* heart smear (x40).  
C *H. americanum*-like cells in *O. edulis* heart smear (x100).

## Conclusions

- It is uncertain what effect, if any, both haplosporidians will have on oyster stocks in Ireland in the future in particular in *O. edulis* stocks.
- The influence of climate change on potential changes in host parasite dynamics will be investigated in future studies

**Acknowledgements:** This project was part funded by the Ireland Wales Programme 2007-2013 INTERREG 4A European Regional Development Fund (ERDF).