Ostreid herpesvirus-1 infection in Pacific Oysters (*Crassostrea gigas*) - New Zealand

A thesis presented in partial fulfilment of the requirements for the degree

Of

Master of Veterinary Studies

At

Massey University
Palmerston North, New Zealand

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2015

Institute of Veterinary, Animal and Biomedical Sciences
Massey University
Palmerston North, New Zealand
2015

Abstract

Ostreid herpesvirus-1 (OsHV-1) was associated with summer mortalities in New Zealand Pacific oysters in 2010-2011. During the mortality investigation, a cohort of Pacific oyster spat, negative with OsHV-1 from a South Island hatchery, were followed forward after transfer to a grow-out farm with high oyster mortalities in the North Island. One important finding in this short longitudinal study was the temporality of OsHV-1 nucleic acid detection by real time PCR assay and onset of Pacific oyster mortality. The research described in this thesis was undertaken to further support the causal link between OsHV-1 infection and oyster mortality. To achieve this aim, an *in situ* hybridisation (ISH) assay was developed to elucidate OsHV-1 infection in Pacific oysters collected from the same short prospective study. OsHV-1 presence and distribution in spat indicated by ISH signal were then correlated with the existence of any histopathological findings in oyster tissues.

Hybridisation of the labelled probe with the target region in the OsHV-1 genome on infected cells produced dark blue to purplish black cell precipitates during colorimetric detection. *In situ* hybridisation signals were seen predominantly in the stroma of the mantle and gills at day 5. Towards day 7 and 9, OsHV-1 infected cells were distributed in various tissues as indicated by the widespread distribution of ISH signals. Histopathological abnormalities were mostly non-specific, however, a progressive pattern of focal and mild to widespread haemocytosis seemed to coincide with the appearance of OsHV-1 infected cells in spat collected at different time-points. The results of this study further supported the view that OsHV-1 was causally involved in summer mortalities observed in farmed oysters in New Zealand. Further studies to

elucidate OsHV-1 pathogenesis in Pacific oysters in association with other causal variables such as elevated temperature are recommended.

Acknowledgement

I would like to express my gratitude to the Investigation and Diagnostic Centre & Response, Ministry for Primary Industries and Massey University for supporting my research.

To my supervisors at IVABS, Massey University - Dr. Matthew Perrott, Dr. Magda Dunowska and Dr. Stuart Hunter, thank you for the patience, support and guidance.

I would like to acknowledge Dr. Colin Johnston who spearheaded the summer mortality investigation on Pacific oysters at IDC&R, Wallaceville and co-started this project.

I would like to convey my special appreciation to Dr. Brian Jones for extensively reviewing the results of this work.

Thanks to Dr. Christiane Löhr, Veterinary Pathologist from Oregon State University for sharing her expertise in interpreting some histology slides.

I thank Evelyn Lupton of the Pathology Department, IVABS, Massey University, for the help.

I am grateful to my colleagues at the Animal Health Laboratory at Wallaceville, especially to Dr. Wendy McDonald and Dr. Joseph O'Keefe for allowing me to work on this investigation; and to the members of Bacteriology and Aquatic Animal Lab

particularly to Cara Brosnahan and Dr. Suzi Keeling for their valuable help and for sharing their work during the course of this project.

I am very thankful to the support of my Immunology teammates, Dr. Richard Spence, Dr. Reinhold Kittelberger, Dr. Rick Clough, Michaela Hannah, Richard Swainsbury, Judy Jenner and Dr. Clive Pigott.

Special thanks to the most important person in my life, my wife Ickel, who supported me in every way; and to my five wonderful daughters, who are not kids anymore, Gale, Julia, Cay, Babes, and Alyson.

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