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

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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.

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