

OPTIMIZATION OF A PLAQUE NEUTRALIZATION TEST CAPABLE OF ASSESSING THE EXPOSURE HISTORY OF PACIFIC HERRING TO VIRAL HEMORRHAGIC SEPTICEMIA VIRUS

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ABSTRACT

Infectious diseases can have significant impacts on wild fish populations; however, disease information is rarely integrated into population assessment models or resource management plans. An exception involves the estimation of annual disease-related mortality in a population assessment model used to forecast abundance of Pacific herring in Prince William Sound, AK. Disease inputs for this Age-Structured Analysis (ASA) model include a combination of infection prevalence data and gross lesion scores that are used to generate an estimate of annual disease mortality. Unfortunately, extrapolation of infection and lesion prevalence data into an annual mortality estimate is not germane to this host / pathogen system. We are developing an alternative approach for forecasting disease potential in Pacific herring populations that is based on known epizootiological relationships. For example, laboratory and field studies indicate that herring survivors of Viral Hemorrhagic Septicemia Virus (VHS) develop adaptive, long-lived resistance if they survive initial exposure. Therefore, a key determinant for forecasting VHSV epizootics may involve a quantitative assessment of population herd immunity. Here we report the optimization of a plaque neutralization assay that is capable of assessing the prior exposure history of Pacific herring to VHSV. Further studies are underway to apply this technique to the population scale and evaluate its utility for forecasting VHSV epizootics.

KEYWORDS

VHSV, Pacific Herring, Plaque Neutralization, Antibodies, Herd Immunity

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