



Australian Government
Department of Agriculture,
Fisheries and Forestry



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Government

USE OF A MULTIPLEX REAL-TIME PCR FOR THE DETECTION AND DIFFERENTIATION OF CLASS I AND CLASS II NEWCASTLE DISEASE VIRUSES (NDV) IN WILD BIRD SPECIES AND POULTRY

PROJECT SUMMARY

Background

It is well established that wild birds could act as reservoirs for paramyxoviruses as well as orthomyxoviruses (Mackenzie et al., 1984; Swayne and Slemons, 1995; Hlinak et al., 2006). This constitutes a threat not only for wild birds but also for commercial poultry. Real-time PCR technology has been used extensively for the detection of pathogens (Mackay et al., 2000). This project constitutes Phase 2 of the 2009/2010 WEDPP project entitled Development and Validation of a Multiplex Real-Time PCR for the Detection and Differentiation of Class I and Class II Newcastle Disease Viruses (NDV) in Wild Bird Species and Poultry. In Phase 1 we evaluated 6 real-time PCRs and developed a multiplex real-time PCR that can detect and differentiate class I and class II NDVs. The new multiplex real-time PCR, which combines a real-time PCR targeting the polymerase gene of class I NDVs (Kim et al., 2008) and a real-time PCR targeting the matrix gene of class II NDVs (Wise et al., 2004) was validated and was shown to be sensitive and specific. The application of the multiplex real-time PCR will help to determine the prevalence of NDV in wild birds and poultry, identify the risk posed by such NDVs, and build reliable ND preparedness. As a result a better knowledge of circulating paramyxoviruses, particularly NDV in wild birds will be established, as these viruses may be of importance not only in wild birds but also in commercial poultry. In this second phase of the WEDPP project it is proposed to use the newly developed and validated multiplex PCR to test actual wild bird samples collected from a variety of areas in Queensland. There is also the opportunity through LEADDR to transfer this technology to other state laboratories

Objectives of this project:

- To utilise the technology validated in WEDPP Project 2009-2010 to understand the epidemiology of NDV in wild birds and poultry including the transfer of NDV strains between wild birds and poultry.
- To apply the knowledge gained to improve strategies for controlling ND in wild birds and in other bird species.
- Transfer the technology to state laboratories to allow the testing of a range of samples from wild bird species from various parts of Australia.
- To attempt multiplexing the NDV multiplex real-time PCR with the avian influenza virus (AIV) real-time PCR.

