
BACHELOR OF SCIENCE (VET) RESEARCH THESES

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Molecular epidemiology of iridovirus infection in Murray cod and ornamental fish

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Research support: The Faculty of Veterinary Science
Supervisor: Professor RJ Whittington

In 2003 an outbreak of iridoviral disease in Murray cod (*Maccullochella peelii peeli*) in an aquaculture facility in Victoria, Australia resulted in 90% losses. Viral inclusions in affected tissues did not stain in an immunoperoxidase test for epizootic haematopoietic necrosis virus infection, the only systemic iridoviral disease of fish known to occur naturally in Australia. A molecular epidemiological approach was undertaken to determine the relationship between this new virus and other iridoviruses. DNA was extracted from formalin-fixed paraffin-embedded tissues of affected Murray cod, and primers were designed to amplify DNA from the major capsid protein, ATPase, and RNA polymerase genes, as well as the CY15 and IRB6 amplicons. There was extremely high nucleotide sequence homology between the Murray cod iridovirus (MCIV) and tropiviruses, particularly infectious spleen and kidney necrosis virus (ISKNV) (≥ 99.9 % identity) and dwarf gourami iridovirus (DGIV) (≥ 99.6 % identity). MCIV was distinct from Red Sea Bream Iridovirus (RSIV), with about 95% homology. MCIV, DGIV and MCIV therefore are strains of the one species of tropivirus, suggesting a common geographic origin, and the entry of MCIV into Australia through trade in ornamental fish. This was confirmed in a survey of routine mortalities in gouramis from pet shops in Sydney. PCR positive gouramis were found in two of four pet shops. Organ filtrates from affected gouramis were injected intraperitoneally into Murray cod juveniles; 29 of 30 died within 28 days with PCR results and microscopic lesions typical of iridoviral infection. Cohabitation of Murray cod with live gouramis led to transmission of the virus through water, with death of 11 of 30 Murray cod. These findings were communicated to relevant government authorities, leading to a review of import policy for freshwater ornamental fish.

H.R. Canne Prize for Excellence in the BSc(Vet)



Professor Beryl Hesketh, Pro Vice Chancellor,
College of Sciences and Technology and
Professor Leo Jeffcott, Dean, Faculty of Veterinary Science
presenting Jeff Go with the award

Studies in anaesthesia of Koi carp

Ms Bronwyn Clayton

Research support: The Faculty of Veterinary Science
Supervisor: Associate Professor Garry Cross

Koi carp are an important species in high value added ornamental aquaculture and are a useful model species for physiological studies applicable to other farmed fish. Clinical procedures are frequently required in finfish but current literature fails to provide a comprehensive guide to anaesthetic agents. Benzocaine, clove oil, AQUI-S[®] and alphaxalone were evaluated in this study. Benzocaine was found to be the most effective agent when tested at various temperatures. A dose of 75 ppm induced stage A4 anaesthesia in all subjects within 8 minutes, with recovery to stage R4 occurring in all subjects within 20 minutes of removal from the exposure bath. Significant disadvantages were seen with the other agents. Increasing doses of agents generally resulted in faster induction times with longer recovery times. Recommendations for further research include studies on maintenance of anaesthesia for lengthy procedures, and the analgesic properties of anaesthetic agents given the increasing importance of animal welfare.

