

WOAH Reference Laboratory for EHNV, YHV1 and AbHV

CSIRO Australian Centre for Disease Preparedness (ACDP)

1. Overview

The ACDP Fish Diseases Laboratory (AFDL) is Australia’s National Reference Laboratory for aquatic animal infectious diseases. We specialise in applied research and diagnostic testing for pathogens of aquatic animals, including finfish, crustaceans and molluscs, with an emphasis on exotic and newly emerging pathogens.

AFDL applied research and diagnostic testing is undertaken according to ISO 9001 and ISO 17025 and, as well as contributing to our WOAHP Reference Laboratory responsibilities, we also contribute to improving capability for other significant pathogens

2. Expertise, services and facilities (photos)

- Disease investigation and identification of infectious agents (pathogens)
 - Development and validation of diagnostic tests for exotic and emerging diseases
 - Applied research on infectious diseases of aquatic animals
 - Advice to Australian State and Commonwealth Government agencies and industry
 - Contributing to national and international Proficiency Testing programs
 - Training and technology transfer
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- Real-time and conventional PCR
 - Virus isolation and identification
 - Sanger, Illumina and MinION sequencing
 - Histology, TEM and immunohistochemistry
 - *In vivo* pathogenicity trials to PC3
 - Generation of reference material



3. Recent Innovations, research highlights, technical developments

WOAH ad hoc Group for *Megalocytivirus pagrus 1*

- [International committee for Taxonomy of Viruses \(ICTV\) established *Megalocytivirus pagrus 1* and genotypes include red seabream iridovirus \(RSIV\), infectious spleen and kidney necrosis virus \(ISKNV\) and turbot reddish body iridovirus \(TRBIV\).](#)
- [M. pagrus 1](#) (RSIV, ISKNV and TRBIV notifiable to WOAHP from 1 January 2025).
- [Concerns over availability of validated diagnostic methods capable of detecting all three genogroups → ad hoc Group was established.](#)
 - Reviewed literature and developed the Technical Disease Card for Member information. 
 - Undertaking interlaboratory comparability (ILC) studies with 10 laboratories globally.
 - Authoring the draft WOAHP Aquatic Manual Chapter for infection with *Megalocytivirus pagrus 1*.

Generation of apparently healthy infected animals by natural routes of infection.

- [Absence of apparently healthy, naturally-infected populations of animals for validation studies.](#)
- [Generating animals using natural routes of infection \(immersion for *M. pagrus 1* and cohabitation with injected prawns for WSSV and YHV1\).](#)
- [Planned sampling of animals before the appearance of clinical signs of disease, targeting a C_T range of >30](#)
 - *M. pagrus 1*: 4 tanks containing 24 barramundi with kidney from 6 fish from each tank sampled at 24, 48, 72 and 96 post exposure.
 - WSSV: 12 conjoined tanks of 30 prawns, with 6 prawns from each tank sampled at 16, 23, 31, 40 and 48 hours post exposure and frozen.
 - YHV1: Samples from a previous pathogenicity project evaluated as suitable and testing completed.

Effect of pooling on DSe and DSp for detection of *M. pagrus 1* and WSSV in apparently healthy animals.

- [Samples tested with two real-time PCR assays.](#)
- [Estimates of DSe and DSp determined for testing pools of 5 \(one POS + 4 NEG\).](#)
- [M. pagrus 1; estimates of DSe and DSp determined for testing kidney individual apparently healthy fish.](#)
- [WSSV: estimates of DSe and DSp determined for testing pools of 5 \(one POS + 4 NEG\) for gills, pleopods, swabs and muscle biopsies.](#)
- [YHV1; pools created and tested and estimates will be determined after M. pagrus1 and WSSV are completed.](#)

Complicated analysis using Bayesian Latent Class Models (BLCM) and generation of the estimates of DSe and DSp for testing both individual and pooled samples is currently being finalised.

- [Started with a simplistic approach then had the opportunity to use BLCM](#)
- [Used a different BLCM model to the WSSV work we did, but have undertaken equivalence testing with the new model](#)

Completing the reports for Australian Government Department of Agriculture, Fisheries and Forestry, who funded the research, then publish to for updates to the WOAHP *Aquatic Manual* chapters.

4. How can we support Members?

- Provide expert diagnostic support for detection and confirmation of aquatic pathogens.
- Support outbreak investigation and epidemiological analysis through collaborative partnerships.
- Share diagnostic protocols, validation data and reference materials to strengthen laboratory testing capability.
- Deliver tailored training programs and workshops in aquatic animal disease diagnostics.
- Facilitate capability development (e.g. PCR, sequencing, virus isolation techniques).
- Facilitate and coordinate proficiency testing and inter-laboratory comparison (ILC) programs.
- Collaborate on applied research projects, including emerging disease characterisation and diagnostic test development.

Contact information

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