

WOAH Reference Laboratory for White Tail Disease of *Macrobrachium rosenbergii* Aquatic Animal Health Laboratory, C. Abdul Hakeem College



1. Overview

White Tail Disease (WTD) is a serious viral infection affecting post-larvae and juveniles of the giant freshwater prawn (*Macrobrachium rosenbergii*).

- It is caused by two viruses acting together: *Macrobrachium rosenbergii* nodavirus (MrNV) and extra small virus (XSV) and causing 100% mortality within 3 to 5 days..
- The clinical sign is a milky, white, or opaque discoloration of the abdominal (tail) muscles.
- These viral pathogens have vertical and horizontal transmission of infection.
- WTD has been diagnosed by RT-PCR and immunological methods

2. Expertise, services and facilities (photos)

- Published 23 International publications covering various aspects of WTD
- Written a Chapter on *Sarothroviruses for Encyclopaedia of Virology, 4th Edition*
- Nominated as Chair, Study Group of *Nodaviridae* and *Sarothroviridae* by International Committee on Taxonomy of Viruses.
- Providing positive control and reagents to diagnosis of WTD. Supplied positive controls to twenty WOAHL member countries and domestic research organizations.
- Established well-equipped Laboratory exclusively for WTD and accredited by ISO 17025:2017. Having sufficient stock of MrNV/XSV and diagnostic reagents.



3. Recent Innovations, research highlights, technical developments

Recently, different studies have been carried out on diagnostics and control measures for WTD of freshwater prawn.

- An antibody-based **lateral flow immune assay (LFA)** has been developed for the early detection of MrNV in the post-larval stage of *M. rosenbergii*. It is farmer friendly and suitable for field level test (Snehal...Sahul Hameed et al., 2021).



- **The recombinant major capsid protein (r-MCP) was found to be an effective immunostimulant** to stimulate the immune system of prawn to protect the post-larvae of *M. rosenbergii* from WTD infection (Farook..Sahul Hameed et al., 2014).
- Somrit et al. (2020) found the role of **glycans as binding molecules for MrNV attachment** in susceptible tissues such as the gills and any strategy that target the virus – host surface glycans interactions helps to reduce MrNV infection in prawn.
- Prawns fed with a combination of **dsRNA of MrNV and XSV capsid genes** showed high relative percent survival whereas 100% mortality was observed in prawn fed with control dsRNA coated feed. This study showed that oral administration of dsRNA is effective, feasible and economical to control MrNV infection in the hatcheries and nurseries (Kumar et al., 2013). The dsRNA specific to MrNV-capsid gene was encapsulated into virus like particles (VLP) and delivered to prawn by immersion (**Thongsum** et al., 2026) to control WTD infection.
- RNAi technology and immersion application should be foreseen as one of the practical, powerful means to fight against prawn viral infection in field application.
- The recent technical development related to WTD include **field level diagnostic kit (LFIA) for early detection of MrNV, recombinant viral capsid protein as immunostimulant and dsRNA to control WTD infection.**

4. How can we support Members?

- **Financial support** either from WOAHL or home country through WOAHL is very much needed to maintain WOAHL Reference Laboratory
- It is difficult to transfer the biological materials to other member countries after COVID period. **So, we need support from WOAHL to transfer the materials among the member countries.**
- We have research materials like viral pathogens, recombinant viral proteins and antibodies for collaborative research with any interested member countries.
- Larval and post-larval stages of freshwater prawn are highly susceptible to MrNV/XSV and adults are resistant to MrNV/XSV and also WSSV. We need financial support to carry the research to find out the factors responsible for resistance. This study would help to develop control and preventive strategies against MrNV/XSV in larval and post-larval stages. This would help to revive the freshwater prawn culture in large-scale in prawn growing countries.
- We have **well-equipped laboratory** to train scientific and non-scientific staff in molecular diagnostic and cell culture techniques.
- We have **repository for fish cell lines and holding 75 cell lines** from a variety of fish.
- We also have **viral repository holding important viral pathogens of shrimp, prawn and fish.**

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