

Cherax quadricarinatus bacilliform virus (CqBV) infection in redclaw freshwater crayfish *Cherax quadricarinatus* from Chile

Redclaw crayfish *Cherax quadricarinatus* are freshwater crayfish native to Northern Australia. Due to their large size, multiple spawning and non-burrowing, non-aggressive behaviour they are a popular species for crayfish farming. Redclaw were imported into Chile from Mexico in 2002 from an OIE-listed disease negative farm. This pilot program aimed to study the introduction of this species into Chile and to examine pathogens and their potential release into the natural environment. Crayfish were kept at a quarantine station in Santiago, Chile and sampled on three occasions for histological analysis.



Figure 1: Map of Chile showing Santiago



Figure 2: Female Redclaw Crayfish



Figure 3: Pond at quarantine station in Santiago

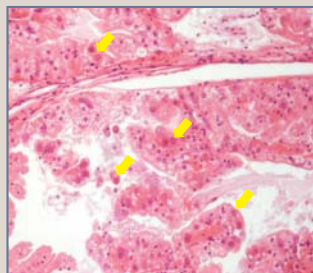


Figure 4: Hepatopancreocytes containing hypertrophied nuclei can be seen spread throughout the tubule epithelia (arrow). Tubules appear degenerate with loss of structure. H&E Stain

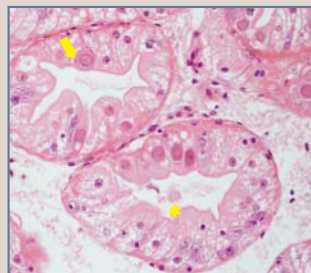


Figure 5: Infected cells are sloughed into the lumen of the tubules following detachment of infected cells from their neighbours (arrow) H&E Stain

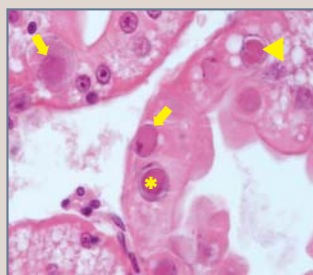


Figure 6: Hypertrophied nuclei show marginal chromatin (arrows), leading to the appearance of intra-nuclear compartmentalisation (arrow head). Eosinophilic viroplasm is present within infected nuclei (arrow). H&E Stain

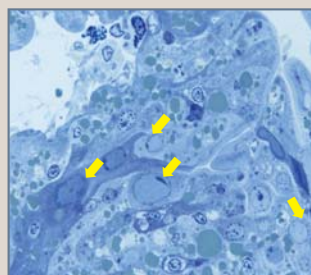


Figure 7: Semi-thin section of hepatopancreas showing hypertrophied nuclei with marginalised chromatin (arrows) within epithelial cells. Toluidine Blue Stain

Histology revealed a putative viral infection within the hypertrophied nuclei of the hepatopancreatic tubule epithelia; the pathology compatible with *Cherax quadricarinatus* Bacilliform Virus (CqBV) infections. Juvenile and subadult crayfish from the first generation offspring reared in Chile were further examined using Transmission Electron Microscopy (TEM).

TEM revealed a non-occluded bacilliform virus in hypertrophied nuclei. Virions were rod-shaped (262 x 88nm) with an electron dense core (225 x 50nm) surrounded by a trilaminar membrane consistent with CqBV infection.

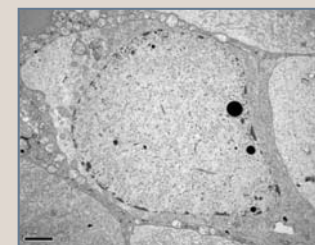


Figure 8: TEM of hypertrophied nuclei from an infected cell containing rod-shaped bacilliform virions. Virions are present in transverse and longitudinal section. Scale bar = 2µm

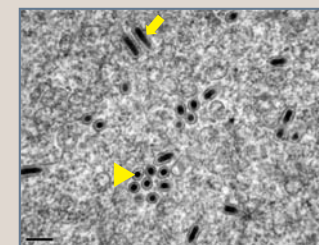


Figure 9: Longitudinal (arrow) and transverse (arrow head) section through bacilliform virions. The central core is surrounded by a trilaminar membrane TEM, Scale bar = 0.2µm

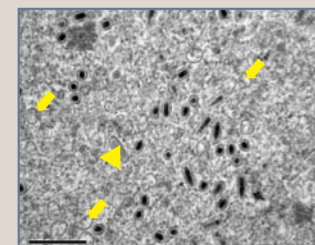


Figure 10: Virions are formed within the nucleus (arrow head), putative trilaminar membranes are free within the viroplasm (arrows) TEM, Scale bar = 0.5µm

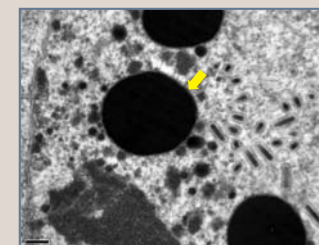


Figure 11: Putative nucleolar remnants are seen as spherical electron dense bodies scattered throughout the viroplasm (arrow). Scale bar = 2µm

At present there is no crayfish farming industry in Chile however interest in developing a fishery is growing, with introduction of non-native species the likely fishery target. The presence of CqBV in imported *C. quadricarinatus* serves to emphasise the need for extreme caution when importing crayfish for fishing or farming. Although some of these diseases may not be notifiable, they may still have significant potential to negatively affect native populations.