

Kesinee Laisutisan 2009: Relationship between Prevalence of Baculo-like Virus (BLV) and Hepatopancreatic Parvo-like Virus (HPLV) in Hepatopancreas of Broodstocks on Growth and Survival Rate of Farm-reared Giant Freshwater Prawn (*Macrobrachium rosenbergii* de Man). Doctor of Philosophy (Fisheries Science), Major Field: Fisheries Science, Department of Fishery Biology. Thesis Advisor: Associate Professor Chalor Limsuwan, Ph.D. 173 pages.

Histopathological examination of giant freshwater prawn (*Macrobrachium rosenbergii*) postlarvae (PL) revealed two types of viral infections in nuclei of hepatopancreatic (HP) tubular epithelium. Histologically, the first pathogen was a baculo-like virus (BLV), recognized by the presence of enlarged nuclei with marginated nucleoli and eosinophilic inclusions that completely filled the nucleus of the HP tubular epithelium. Transmission electron microscopy (TEM) of infected HPs revealed the presence of BLV particles of approximately 250-300 nm in enlarged nuclei. The second virus was a hepatopancreatic parvo-like virus (HPLV). Spherical intranuclear inclusions were easily observed in the HP tubular epithelium. TEM of infected HPs revealed intranuclear inclusions containing small virus-like particles of approximately 20-24 nm in diameter. However, polymerase chain reaction tests for shrimp hepatopancreatic parvovirus (HPV) and monodon baculovirus (MBV) previously reported from Thailand were all negative suggesting that both viruses in this study were genetically distinct from HPV and MBV.

The PL from the broodstocks of *M. rosenbergii* in which no virus was detected and the PL from broodstocks which tested positive for BLV, HPLV and dual infections (BLV 40%, HPLV 20% and dual infections 10%) were raised in nursery tanks with three replicates for 25 days. Results showed that the average survival rate of prawn from the virus free group of $72 \pm 2.0\%$ was statistically higher ($P < 0.05$) than the $63 \pm 1.0\%$ from the group that was infected with these viruses. To determine whether BLV and HPLV were related to prawn mortalities or growth retardation in cultured *M. rosenbergii*, both groups of PL (Group 1 virus free Group 2 infected with BLV 20%, HPLV 50% and dual infections 10%) were raised in earthen ponds for 180 days. The prawns were sampled and divided into small and large-sized prawns at 60, 120, 150 and 180 days for histological studies to determine the viral infections. Results showed that production and percentage survival rate of prawns from the virus-free group was 202.55 ± 0.78 kg/rai and $63.49 \pm 0.35\%$, respectively compared with 198.25 ± 1.22 kg/rai and $68.43 \pm 0.76\%$ in the group that was infected with viruses. Percentage infection rate of prawns from this group at 60 and 120 days revealed that BLV infection in the small-sized prawns (15 and 12.5%) was higher than that in the large-sized prawns (10 and 5%). There was dual infection with both viruses (15 and 5%) in small-sized prawns and (10 and 2.5%) in large-sized prawns. However, at day 150 the BLV pathogen was not observed in either size group. In contrast, the HPLV infection was found in prawns throughout the culture period. The percentage infection rates in small-sized prawns at days 120, 150 and 180 were 22.5, 15.0 and 12.5% respectively, which were similar to the large-sized prawns infection rates of 20.0, 12.5 and 12.5%, respectively. These results indicated that the infection rates of these two viruses did not increase during the culture period and that the virus infections did not affect growth in *M. rosenbergii*. A survey of *M. rosenbergii* PL and broodstocks from five hatcheries located in Petchaburi, Ratchaburi, Suphanburi, Kanchanaburi and Chanthaburi provinces were also studied.

Student's signature

Thesis Advisor's signature