

Pathogenicity of *Vibrio parahaemolyticus* in farmed juvenile white leg shrimp (*Litopenaeus vannamei*)

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Abstract

Vibrio infection (*Vibrio parahaemolyticus*) occurred in white leg shrimp (*Litopenaeus vannamei*) farms in Delwar Bushehr region in 2019. *V. parahaemolyticus* invasive bacteria were isolated from hemolymph and hepatopancreas of diseased shrimps. The pathogenicity of *V. parahaemolyticus* was examined in 30 samples of healthy farmed shrimp (*L. vannamei*) with an average weight of 4 ± 0.76 gr and an average length of 5.5 ± 0.61 cm, which were sampled from farms. Injection of bacterial suspension into the hemolymph and tail muscle of shrimp in the amount of 0.05 ml with concentrations of 106, 105, 104 cells/ml by means of a 2 ml insulin syringe through the second pair of preopods to the hemolymph sinuses and through the third abdominal segment under the cuticle of the muscle. The moribund shrimps were collected and after the isolation of bacteria on TSA and TCBS medium, the samples were fixed in Davidson's solution for pathological study. The prepared tissue sections of hepatopancreas and tail muscle were stained with hematoxylin and eosin (H & E) and Giemsa. *V. parahaemolyticus* in the diseased shrimp with a hepatopancreatic infection of *V. parahaemolyticus* showed bacterial invasions and multiplication. This condition was followed by necrosis of hepatopancreatic cells subsequent granulomatous encapsulation of the invaded tubules, and production in the hepatopancreatic tubules caused systemic bacterial dissemination which resulted in marked necrosis in the heart and lymphoid organ. On the other hand, the shrimps with percuticular infection in the spongy connective tissue in the telson and systemic dissemination were followed by the occurrence of bacterial phagocytosing haemocytes in the various tissues. Intramuscular injection of 105 – 106 colony forming units per shrimp resulted in mortalities of 50 -90%. The injected shrimp exhibited systemic infection in the moribund condition and granulomatous encapsulation in the injected sites on day's 2-10 post injection. Therefore, under appropriate conditions and in the event of stress, this bacterium can be considered a pathogen in farmed white leg shrimp.

Keywords: *Vibrio parahaemolyticus*, *Litopenaeus vannamei*, Hepatopancreatic necrosis, Pathogenicity.