

Possibility of preventing Acute Hepatopancreatic Necrosis Disease (AHPND), a killer disease in cultured shrimp caused by a unique strain of *Vibrio parahaemolyticus* if the strain enters into Sri Lankan culture systems

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Acute Hepatopancreatic Necrosis Disease (AHPND), initially termed as early mortality syndrome (EMS) is recognized as a newly emerging disease in cultured penaeid shrimp including black tiger shrimp (*Penaeus monodon*) and Pacific White shrimp (*Litopenaeus vannamei*). The disease was first reported in China in 2009 and over the last 5 years it spread through many Asian countries and even to Mexico. It is now confirmed that the causative agent of AHPND is a unique strain of *Vibrio parahaemolyticus* that cause massive sloughing off of tubular epithelial cells of hepatopancreas resulting 100% mortality in shrimp in grow-out ponds. AHPND bacteria are believed to colonize shrimp gut and release toxins that enter hepatopancreas. Sri Lankan shrimp farmers have not experienced massive mortality due to AHPND. However, monitoring total *Vibrio* and *V. parahaemolyticus* in culture water and in shrimp gut is very important in planning strategies for the prevention/control of AHPND if it is observed; bio-augmenters and probiotics could be used to control harmful bacteria. Therefore, *Vibrio* sp. and *V. parahaemolyticus* were monitored in culture water and in shrimp gut (using standard procedures) over two production cycles in two randomly selected groups of shrimp grow out ponds in the North Western province. Locally produced bioaugmenter /probiotic was used (for culture water and shrimp respectively) for the experimental group of ponds while control pond water and shrimp were managed under the normal procedures of farmers. Culture water of experimental ponds had a significantly lower count of *V. parahaemolyticus* (35.5 ± 6.9 CFU mL⁻¹) and total *Vibrio* count (419.5 ± 36.3 CFU mL⁻¹; $P < 0.05$) compared to those values of control ponds (918.8 ± 78.2 CFU mL⁻¹ and 3745 ± 221 CFU mL⁻¹). Guts of shrimp from experimental ponds were negative for *V. parahaemolyticus* (0 CFU mL⁻¹) and total *Vibrio* count in the gut was $1.28 \pm 0.12 \times 10^4$ CFU mL⁻¹; those values of control ponds were 7.23×10^2 CFU mL⁻¹ and $1.31 \pm 0.11 \times 10^7$ CFU mL⁻¹ respectively. Results show that the water in shrimp culture ponds as well as gut of shrimp are colonized heavily by different species of *Vibrio* including *V. parahaemolyticus* and the use of locally produced bioaugmenter /probiotic has the ability to control the populations of *V. parahaemolyticus* and other *Vibrio* sp. Further studies are required to find out whether the unique strain of *V. parahaemolyticus* that causes AHPND is present or not in our shrimp culture systems and if it is present whether that unique strain also could be controlled by the same local bioaugmenter/probiotic.