

## Documents

Baharuddin, N.-A.S.<sup>a</sup>, Ghani, W.-A.W.A.<sup>a</sup>, Othman, S.F.C.<sup>a</sup>, Nawi, M.F.<sup>b</sup>, Hamid, T.H.T.A.<sup>a</sup>

**The effect of supplementation of *Lactococcus lactis* strain as probiotic on the growth and survival of *Litopenaeus vannamei***

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<sup>a</sup> International Islamic University Malaysia, Kulliyah of Science, Department of Biotechnology, Jalan Istana, Bandar Indera Mahkota, Kuantan, 25200, Malaysia

<sup>b</sup> International Islamic University Malaysia, Kulliyah of Science, Department of Marine Science, Jalan Istana, Bandar Indera Mahkota, Kuantan, 25200, Malaysia

### Abstract

Acute Hepatopancreatic Necrosis Disease (AHPND) or Early Mortality Syndrome (EMS) is a bacterial disease in shrimps caused by pathogen *Vibrio parahaemolyticus*. It has culminated in huge loss in global shrimp production due to mass mortality. A probiotic strain *Lactococcus lactis* strain FA1 was recently isolated from shark intestine, showing inhibition towards the growth of the pathogen. Due to inhibitory potential, the effect of probiotics strain on growth performance of shrimp infected with *V. parahaemolyticus* was evaluated. The probiotic strain was incorporated into feed for juvenile shrimps *Litopenaeus vannamei* for 3 weeks before which they were then challenged with pathogen *Vibrio parahaemolyticus*. The study compares 4 shrimp groups: Control (Without any treatment); Group A (Probiotic treated, uninfected); Group B (Probiotic treated, infected) and Group C (No probiotic, infected). The survival and growth performance (weight and length gain) of shrimps were evaluated in the following 30 days. Statistical analyses (ANOVA; Post Hoc Tukey) were used to compare between shrimp groups. In general, infected shrimp demonstrated some of the key symptoms of AHPND (pale or white hepatopancreas), transparent body and erratic swimming behaviour. The supplementation of probiotics resulted in an improved survivability ( $65\pm 1\%$ ) compared to infected shrimp ( $45\pm 1\%$ ). The probiotic treated shrimp group showed to have better % body weight gain, in which weight gain between group B (treated/infected) and group C (untreated/infected) were significantly different (at  $P=0.046$ ); and so, to group A (treated/uninfected) when compared with group C ( $P=0.047$ ). There is however no significant difference in % length gain between the groups. Meanwhile, some of the infected shrimps were able to show recovery from the infection. Pre-infection probiotic treatment showed better performance compared to post-infection probiotic treatment. This indicated that the strain *Lactococcus lactis* is highly suitable for use as the future probiotic in shrimp aquaculture. © Articles by the authors; Licensee SMTCT, Cluj-Napoca, Romania.

### Author Keywords

acute hepatopancreatic necrosis disease; early mortality syndromes; *Lactococcus lactis*; *Litopenaeus vannamei*; shrimp probiotics

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**Correspondence Address**

Hamid T.H.T.A.; International Islamic University Malaysia, Jalan Istana, Bandar Indera Mahkota, Malaysia; email: hazyamin@iium.edu.my

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