ABSTRACT

IKO IMELDA ARISA. Application of probiotic, prebiotic and synbiotic to enhance the immune response of shrimp Litopenaeus vannamei against Vibrio harveyi infection. Under direction of WIDANARNI and MUNTI YUHANA.

Probiotic, prebiotic and synbiotic are now widely used in aquaculture and showed their capability in controlling the bacterial disease. The aim of this study was to test the effectiveness of probiotic, prebiotic and synbiotic in enhancing the immune response of shrimp against Vibrio harveyi infection. This research comprised of 5 treatments, namely: control P0(+), control P0(-), 1% probiotic (P1), 2% prebiotic (P2) and synbiotic (1% probiotic+2% prebiotic: P3). Probiotic SKT-b (dose 10^6 CFU/ml) was supplemented into bacterial feed. Prebiotic used in this study was oligosaccharides derived from sweet potato varietie of Sukuh (2% of the feed weight). Shrimp used in this study was Litopenaeus vannamei larvae (±3.5 g in weight). Shrimp were cultured aquaria 60x35x30 cm^3 filled with 40 L seawater for 28 days. Immune response parameters observed including total hemocyte, phagocytic activity and phenoloxidase activity (PO). Each parameter was observed 9 times, i.e at 0, 7 and 14 day of culture and after a challenge test, i.e at the 6, 12, 24, 72, 120 and 168 hours post infection. Post-test results showed that the highest survival P3 treatment (100%), followed by P1(90%), P2(83%), and P0(+)(60%) showed by respectively. The results of the immune response observed during the study showed the highest in P3 (total hemocyte 3.36±0.05-9.32±0.05x10^6 cells/ml, phagocytic activity of 16.48±0.14-77.55±0.22% and PO activity 0.128±0.03-0.591±0.01) and the lowest was P0(+) (total hemocyte 3.15±0.16-4.53±0.33x10^6 cell/ml; phagocytic activity 10.15±0.10-20.78±0.34% and PO activity 0.128±0.03-0.181±0.03). From this study, we concluded that the addition synbiotic into the feed can improve the immune response of shrimp better than the other treatments.

Keywords: probiotic, prebiotic, synbiotic, Vibrio harveyi, Litopenaeus vannamei