ABSTRACT

A COMPARATIVE STUDY ON THE EFFECTIVENESS OF COMMERCIL PROBIOTIC *Lactobacillus* sp. AND *Bacillus subtilis* ATCC 6633 ISOLATE IN PREVENTING *Vibrio parahaemolyticus* INFECTION IN THE CULTURE OF PACIFIC WHITELEG SHRIMP (*Litopenaeus vannamei*)

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Vibrio parahaemolyticus is one of the pathogenic bacteria of *Acute Hepatopancreatic Necrosis Disease* (AHPND) of whiteleg shrimp (*Litopenaeus vannamei*). One of the means to resolve the issue is through the supplementation of probiotics to enhance shrimp immunity and to inhibit the development of the pathogens. This study was undertaken to compare the performance between commercial grade *Lactobacillus* sp. probiotics and the isolate of *Bacillus subtilis* ATCC 6633 to enhance the immune response as well as whiteleg shrimp resistance against infection by *V. parahaemolyticus*. Completely randomized design (CRD) was used with four treatments and three reps: positive control (feed and challenge test), negative control (feed with no challenge test), treatment A (feed + *Lactobacillus* sp. 10^6 CFU/kg feed + challenge test), and treatment B (feed + *B. subtilis* ATCC 6633 10^6 CFU/kg feed + challenge test). Total *Hemocyte Count* (THC), *Differential Hemocyte Count* (DHC), *Mean Time to Death* (MTD), *survival rate*, *Lipid droplet* accumulation, clinical symptoms, and quality of the water were data recorded. It was discovered that the supplementation with *B. subtilis* isolate provided significant effect ($P<0.05$) on THC, the number of the hyaline cells on the test on DHC test, MTD test, survival rate, and lipid droplet level. *B. subtilis* ATCC 6633 at the level of 10^6 CFU/ml demonstrated more effectiveness when tested with the commercial grade *Lactobacillus* sp. probiotics to enhance theimm.

Keywords: Immune response, Probiotics, Whiteleg Shrimp (*Litopenaeus vanamei*), *Vibrio* sp.

ABSTRAK

STUDI PERBANDINGAN EFEKTIVITAS PROBIOTIK KOMERSIL *Lactobacillus* sp. DAN ISOLAT *Bacillus subtilis* ATCC 6633 DALAM MENCEGAH SERANGAN *Vibrio parahaemolyticus* PADA BUDIDAYA UDANG VANAME (*Litopenaeus vannamei*)

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Vibrio parahaemolyticus merupakan salah satu bakteri patogen penyebab penyakit *Acute hepatopankreatic nekrosis diease* (AHPND) terhadap udang vaname. Salah satu upaya untuk mengatasi masalah ini adalah dengan menggunakan probiotik, yang dapat meningkatkan imunitas udang dan menekan pertumbuhan patogen. Tujuan dari penelitian ini yaitu untuk membandingkan efektivitas probiotik *Lactobacillus* sp. komersil dan isolat *B. subtilis* ATCC 6633 dalam respon imun dan ketahanan udang vaname terhadap *V. parahemolyticus.* Rancangan yang digunakan adalah Rancangan Acak Lengkap (RAL) dengan 4 perlakuan 3 kali ulangan yaitu Kontrol + (pakan dan diuji tantang), Kontrol – (pakan dan tidak diuji tantang, perlakuan A (pakan+ *Lactobacillus* sp. 10^6 CFU/kg pakan dan diuji tantang), perlakuan B (pakan+ isolat *B. subtilis* ATCC 6633 10^6 CFU/kg pakan dan diuji tantang). Data yang dikumpulkan yaitu *Total hemosit count* (THC), *Differensial hemosit count* (DHC), *Mean time death* (MTD), Tingkat kelangsungan hidup, *Lipid Droplet*, Gejala klinis dan Kualitas air. Hasil penelitian menunjukkan bahwa pemberian Isolat *B.subtilis* memberikan pengaruh yang berbeda nyata ($P<0,05$) terhadap THC, DHC sel hyalin, MTD, TKH, dan *Lipid droplet.* Pemberian isolat *B. subtilis* ATCC 6633 10^6 CFU/ml menunjukkan efektivitas yang lebih baik dibandingkan probiotik *Lactobacillus* sp. komersial dalam meningkatkan respon imun dan menekan tingkat kematian pada udang vaname (*Litopenaeus vannamei*) yang terinfeksi *V. parahaemolyticus*.

Kata Kunci: Probiotik, respon imun, Udang vaname (*Litopenaeus vanamei*), *Vibrio* sp.