

Intisari

Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan aerasi *microbubble* dan probiotik terhadap tingkat stres dan respon imun humoral udang vaname (*Litopenaeus vannamei*) pada sistem budidaya resirkulasi. Penelitian ini menggunakan metode eksperimen dengan rancangan acak lengkap 2x2 faktorial dengan 2 level aerasi (*blower* dan *microbubble*) dan 2 level probiotik (pakan nonprobiotik dan pakan berprobiotik). Udang vaname berukuran 7,6 g dipelihara selama 60 hari di bak sistem resirkulasi yang diberi aerasi sesuai perlakuan yaitu menggunakan *blower* dan *microbubble*. Pakan diberikan sebanyak lima kali sehari dengan dosis 5% dari total biomassa. Uji stres dilakukan pada akhir penelitian dengan salinitas rendah 5 ppt selama 3 jam. Pengamatan parameter stres meliputi kadar glukosa hemolim dan sintasan dilakukan pada awal, panen dan setelah uji stres. Pengamatan respon imun humoral yang meliputi total protein plasma (TPP), antibakterial serum, aglutinasi alami, aktivitas *Phenoloxidase* (PO), laju ledakan respirasi, dan aktivitas *Superoxide Dismutase* (SOD) dilakukan sebelum dan setelah uji stres. Hasil menunjukkan bahwa faktor aerasi berinteraksi ($P < 0,05$) dengan faktor probiotik, sintasan tertinggi pada perlakuan aerasi *microbubble*+pakan nonprobiotik dan nilai terendah terdapat pada perlakuan aerasi *blower*+pakan nonprobiotik. Hasil penelitian menunjukkan bahwa aerasi *microbubble* dan probiotik meningkatkan sintasan, aktivitas antibakterial serum, aglutinasi alami dan SOD, akan tetapi menurunkan glukosa hemolim dan ledakan respirasi. Hal ini menunjukkan bahwa kombinasi penggunaan aerasi *microbubble* dan pakan probiotik mampu meningkatkan ketahanan stres dan respon imun udang vaname.

Kata kunci: aerasi, imun, *microbubble*, probiotik, tingkat stres, udang vaname.

Abstract

This research aimed to evaluate the effect of microbubble aeration and *BALSS* probiotic application on stress level and humoral immune response of white shrimp (*Litopenaeus vannamei*) at recirculating aquaculture system. Completely randomized design was used in this experiment with 2x2 factorial of two level aerations (microbubble and blower) and two level probiotics (nonprobiotic and probiotic diet) in three replicates. White shrimp (7,6 g) were cultured for 60 days in tanks aerated using microbubble or blower. The control and probiotic supplement feeds were given 5% of biomass/day five times a day. Salinity stress with 5 ppt for 3 h was tested at the harvest. Stress parameters including blood glucose and survival rate were observed at initial, harvest and after stress test. Humoral response immune parameters including total protein plasma (TPP), antibacterial serum, natural agglutination, *phenoloxidase* (PO), respiratory burst, and *superoxide dismutase* (SOD) were observed before and after stress test. Survival rate showed interaction ($P < 0.05$) between aeration and probiotic factors, the highest was *microbubble* aeration+ probiotic diet treatment and the lowest was blower aeration+ nonprobiotic diet treatment. The results showed that microbubble aeration and probiotic increase survival rate, antibacterial serum activity, natural agglutination and *superoxide dismutase* (SOD), but decrease hemolymph glucose and respiratory burst. This suggests that application of microbubble aeration with probiotic might increase stress resistance and humoral immune response of white shrimp.

Keywords: aeration, immune, *microbubble*, probiotic, stress level, white shrimp.