INTISARI

PENGARUH PADAT TEBAR DAN SALINITAS AIR PAYAU BUATAN TERHADAP PERTUMBUHAN DAN PERFOMA FISIOLOGIS UDANG VANAME (*Litopenaeus vannamei* Boone, 1931)

Budidaya udang vaname (*Litopenaeus vannamei*) saat ini masih jarang dilakukan di pedalaman karena tidak tersedianya air payau sebagai media untuk pemeliharaannya. Air payau buatan merupakan solusi untuk mengatasi permasalahan tersebut. Penelitian ini bertujuan untuk (1) menentukan padat tebar budidaya udang vaname menggunakan media air payau buatan berdasarkan daya dukung, (2) mengkaji pengaruh salinitas air payau buatan terhadap pertumbuhan dan konsentrasi glukosa hemolim udang vaname (3) mengetahui kandungan mineral Mg, Ca, Na dan K pada salinitas media air payau buatan (4) mengkaji tingkat kerja osmotik (TKO) udang vaname yang dibudidaya menggunakan media air payau buatan. Penelitian ini terdiri atas dua tahap disusun menggunakan rancangan acak lengkap (RAL). Wadah yang digunakan ember V=55 L yang diisi air media 50 L. Benih udang yang digunakan berukuran 1,77 g/ekor dengan panjang rata-rata 6,3 cm. Selama pemeliharaan udang diberi pakan buatan bentuk butiran dengan ransum 5%/biomassa dengan frekuensi 5 kali/hari. Masing-masing ember diaerasi menggunakan blower yang diatur aliran udara 3 lpm. Rata-rata oksigen terlarut sebesar 5,3 mg/L. Konsumsi oksigen udang vaname sebesar 0,49 mg/O_2/h dan daya dukung sebesar 234,69 g/50L atau equivalen padat tebar (*stocking density* = SD) 40 ekor/50L ukuran benih udang awal 1,77 g/ekor. Perlakuan tahap pertama terdiri atas 3 padat tebar yaitu SD (40 ekor/50L), SD-50% (20 ekor/50L), dan SD+50% (60 ekor/50L) diulang 5 kali. Perlakuan tahap kedua menentukan salinitas terbaik dengan 5 perlakuan salinitas 10, 15, 20, 25 dan air laut sebagai kontrol (35 ppt) masing-masing diulang 3 kali. Percobaan pertama didapatkan pertumbuhan dan perfoma fisilogis terbaik pada padat tebar 20 ekor/50L menghasilkan sintasan (SR) 87±8,36%, laju pertumbuhan spesifik (SGR) 3,26±0,76%/hari dan konsentrasi glukosa hemolim sebesar 30,73±5,28 mg/dl, yang berbeda nyata ($P<0,05$) dengan padat tebar lain. Percoaban tahap kedua diperoleh perfoma udang terbaik pada salinitas 20 ppt dengan SR 70,00±5,00%, SGR 1,55 ±001%/hari, konversi pakan (FCR) 1,72±0 dan glukosa hemolim 73,44±4,44 mg/dl, yang berbeda nyata ($P<0,05$) dengan salinitas yang lain. Kandungan mineral Mg (138,51-272,16 mg/L), Ca (156-212 mg/L), Na (4365-7017 mg/L) dan K (71-186 mg/L) pada air payau buatan lebih rendah dibandingkan air laut. TKO udang vaname terendah didapatkan pada salinitas 15-20 ppt yang berarti mendekati iso-osmotik. Berdasarkan penelitian ini dapat disimpulkan bahwa budidaya udang vaname menggunakan air payau buatan dengan salinitas 20 ppt, padat tebar 20 ekor/50L menghasilkan pertumbuhan dan perfoma fisiologis terbaik. Disarankan dilakukan penambahan mineral Mg dan Ca pada air payau buatan untuk meningkatkan pertumbuhan dan perfoma fisiologis.

Kata kunci: air payau buatan; konsumsi oksigen; osmoregulasi respon stres; udang vaname

ABSTRACT

EFFECTS DENSITY AND SALINITY OF ARTIFICIAL BRACKISH WATER ON THE GROWTH AND PHYSIOLOGICAL PERFOMANCE OF WHITE LEG SHRIMP (Litopenaeus vannamei Boone, 1931)

Culture of vannamei shrimp (*Litopenaeus vannamei*) is currently rarely practiced inland areas due to the unavailability of brackish water as a medium for their life. Artificial brackish water is a solution to solve this problem. This study aims to (1) determine the stocking density of vaname shrimp using artificial brackish water media based on carrying capacity, (2) examine the effect of artificial brackish water salinity on the growth and concentration of vanname hemolymph glucose (3) determine the mineral content of Mg, Ca, Na and K in artificial brackish water media salinity (4) examines the osmotic work (OW) of vannamei shrimp cultivated using artificial brackish water media. This study consisted of two stages arranged using a completely randomized design (CRD). The container used was a V=55 L plastic bucket filled with 50 L of media water. The shrimp seeds used were 1.77 g/head with an average length of 6.3 cm. During the culture, shrimps were given granulated artificial feed with a ration of 5%/biomass with a frequency of 5 times/day. Each bucket is aerated using a blower which is regulated by an air flow of 3 lpm. The average dissolved oxygen is 5.3 mg/L. The vannamei shrimp oxygen consumption was 0.49 mg/O2/h and the carrying capacity was 234.69 g/50L or the stocking density equivalent (SD) of 40 individuals/50L with initial shrimp seed size of 1.77 g/head. The first stage treatment consisted of 3 stocking densities namely SD (40 shrimps/50L), SD-50% (20 shrimps/50L), and SD+50% (60 shrimps/50L) repeated 5 times. The second stage of treatment determines the best salinity with 5 treatments of salinity 10, 15, 20, 25 and seawater as a control (35 ppt) each repeated 3 times. The first experiment found the best growth and physiological performance at a stocking density of 20 individuals/50L resulting in a survival rate (SR) of 87 ± 8.36%, a specific growth rate (SGR) of 3.26 ± 0.76%/day and a hemolymph glucose concentration of 30. 73±5.28 mg/dl, which was significantly different ($P<0.05$) from other stocking densities. The second stage of the experiment obtained the best shrimp performance at 20 ppt salinity with SR 70.00 ± 5.00%, SGR 1.55 ± 001%/day, feed conversion (FCR) 1.72 ± 0 and hemolymph glucose 73.44 ± 4 .44 mg/dl, which was significantly different ($P<0.05$) from the other salinities. The mineral content of Mg (138.51-272.16 mg/L), Ca (156-212 mg/L), Na (4365-7017 mg/L) and K (71-186 mg/L) in artificial brackish water is lower than seawater. The lowest vaname shrimp OW was found at a salinity of 15-20 ppt, which means it is close to iso-osmotic. Based on this research, it can be concluded that the cultivation of vannamei shrimp using artificial brackish water with a salinity of 20 ppt, a stocking density of 20 individuals/50L produces the best growth and physiological performance. It is recommended to add Mg and Ca minerals to artificial brackish water to increase growth and physiological performance.

Keywords : artificial brackish water; osmoregulation; oxygen consumption; stress responses; white leg shrimp;