Effects of carbon sources on the culture of giant river prawn in biofloc system during nursery phase

ABSTRACT

A six-week nursery culture of giant river prawn Macrobrachium rosenbergii was conducted in a zero-water exchange biofloc technology (BFT) system. Water quality, microorganisms, proximate composition and growth performance of prawn were compared by using five different carbon sources: wheat bran (WB), rice flour (RF), molasses (MO), maize starch (MS) and palm kernel expeller (PKE). These carbon sources were added at a carbon-nitrogen ratio of 15:1. Fifteen 125 L polyethylene tanks with water volume of 100 L were used for this experiment. Each tank was stocked with 100 postlarvae (average initial weight 21.9 ± 2.3 mg). Each treatment was randomly assigned in triplicate. The water quality parameters viz. temperature, pH, dissolved oxygen and ammonia-N did not differ ($P > 0.05$) among five different carbon treatments. MO based BFT system had significantly ($P < 0.05$) lowest nitrite-N and the highest biofloc volume than other treatments. The postlarval survival (88.6 %) was significantly higher ($P < 0.05$) in MS treatment and followed by RF (73.0 %), MO (68.3 %), WB (61.0 %) and PKE (56.3 %) treatments, respectively. Significantly ($P < 0.05$) better FCR (2.21) was obtained in MS treatment. The final weight, weight gain and specific growth were similar ($P > 0.05$) among the five treatments. Higher gross return, net return and benefit-cost ratio were obtained in MS group than WB, MO and PKE. Significantly ($P < 0.05$) the highest lipid (1.97 % dry weight) was obtained in MS bioflocs and followed by RF, WB, MO and PKE bioflocs, respectively. The present study indicated that MS carbon source for biofloc technology enhanced M. rosenbergii postlarval survival and growth.

Keyword: Macrobrachium rosenbergii; Biofloc; Growth; Nursery; Zero water exchange; Carbon sources