

Effects of Locally Available Carbon Sources on the Growth and Survival of Guppy (*Poecilia reticulata*) Fingerlings in a Biofloc System

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BioFloc Technology (BFT) is based on *in-situ* microorganisms that recycle nutrition by assimilating the toxic nitrogenous waste to improve the water quality in aquaculture facility. This study was conducted to identify the effects of locally available Carbon (C) sources on water quality management and growth of Guppy (*Poecilia reticulata*) fingerlings in a BFT system. Six BFT treatments with three C sources were checked as Rice Bran (RB), Molasses (MOL), Wheat Flour (WF), 1:1 mix of RB: MOL (RBMOL), 1:1 mix of WF: MOL (WFMOL), and 1:1 mix of RB: WF (RBWF). Control (CON) was maintained without any carbon source. Male Guppy fish (0.25 ± 0.02 g and 2.23 ± 0.09 cm) were cultured in fiber-reinforced plastic tanks (30 fish/80 L tank) for 42-days and fed with a commercial diet (3 % BW/day) once a day. C/N ratio was maintained at 15:1 by adding relevant carbon sources. Growth performance and feed utilization of fish and water quality (Temperature, DO, pH, Ammonia, Nitrite and Nitrate) were evaluated. Feed Conversion Ratio in all the BFT treatments (0.99 ± 0.08 to 1.31 ± 0.18) were significantly lower than that of CON (2.27 ± 0.41). The final weight of fish in all BFT treatments were significantly higher than CON (0.46 ± 0.09 g) except for MOL (0.56 ± 0.10 g). RBWF (0.74 ± 0.14) and RB (0.71 ± 0.13) treatments showed significantly higher weights than the MOL. The final length of fish in RB (3.07 ± 0.22 cm), RBWF (3.02 ± 0.19 cm) and WF (2.97 ± 0.27 cm) were significantly higher than the CON (2.75 ± 0.24 cm) and MOL (2.76 ± 0.19 cm). Percentage Average Daily Gain and %Specific Growth Rates of RBWF (4.66 ± 0.23 and 2.58 ± 0.08) and RB (4.60 ± 0.49 and 2.56 ± 0.16) treatments were significantly higher than CON (1.64 ± 0.43 and 1.24 ± 0.25). Survival rates were between 42% (RB) and 69% (RBWF). Temperature (27.87 °C), DO (7.72 mg/L), and pH (7.81) were within the favorable range. Total Ammonia Nitrogen (TAN) levels of all the treatments were below 1.09 mg/L without any significant differences with CON. Nitrite levels of BFT treatments were lower than 0.53 mg/L. The use of BFT systems with a 1:1 mix of Rice Bran: Wheat Flour (RBWF) as the carbon source has increased the growth performance, survival, feed utilization, and floc quality in terms of inhabited microorganisms of Guppy reared in biofloc system. Therefore, it can be concluded that 1:1 RBWF mixture is the best carbon mixture among the tested carbon sources for maintaining BFT systems for Guppy culture tanks.

Keywords Biofloc technology, Guppy, *Poecilia reticulata*, carbon sources