



## ZOOTECHNICAL PERFORMANCES OF DIFFERENT CARBON SOURCES ON BIOFLOC COMPOSITION AND GROWTH OF TILAPIA (*Oreochromis mossambicus*)

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### Abstract

Biofloc technology (BFT) is a novel technique of enhancing water quality in aquaculture systems through balancing carbon and nitrogen, with the added value of producing proteinaceous feed *in-situ*. The present study was carried out to evaluate the physio-chemical characteristics of different locally available carbon-treated bioflocs, and their suitability as a proteinaceous feed over traditional fish meal in enhancing the growth of *Oreochromis mossambicus*, in zero-water exchange culture systems. Carbon treatments: Wheat Flour (WF), Molasses (MOL), and Rice Bran (RB), and the controls were randomly assigned and duplicated. Mixed-sex of *O. mossambicus* fingerlings with an initial body weight  $\pm$  SD ( $3.6 \pm 0.2$ g) were added to each tank at the rate of 40 fish  $m^{-3}$  and fed with commercial feed at 3% of their body weight. Carbon was only added to the treatment tanks in a 15:1 carbon to nitrogen ratio. Fish weight was measured weekly throughout the 60 days of the culture period. Biofloc samples, was structurally analyzed using Scanning Electron Microscope (SEM) and biochemically analyzed in terms of crude protein, lipid, fiber, ash and moisture. Total Weight Gain (TWG), Specific Growth Rate (SGR), and Feed Conversion Ratio (FCR) were used to evaluate the growth of the fish. One way ANOVA was used for analysis of data. Protein content was significantly higher in WF ( $19.24 \pm 0.40\%$ ) and RB ( $18.18 \pm 0.50\%$ ). WF showed significantly higher ash ( $4.20 \pm 0.10\%$ ) and moisture ( $73.92 \pm 0.07\%$ ) contents, while MOL indicated the highest fiber ( $7.38 \pm 0.27\%$ ) and carbohydrate ( $82.52 \pm 0.23\%$ ) contents ( $P < 0.05$ ). There was no significant difference in lipid content. In SEM images the morphological structure differed slight between treatment groups. TWG and SGR were significantly enhanced in RB treated biofloc ( $90.53 \pm 0.39\%$  and  $4.21 \pm 0.07\%$  respectively) with a significantly lower FCR of  $0.59 \pm 0.01$ . Hence, RB is recommended as a better carbon source in biofloc-based *O. mossambicus* culture, to encourage the low-cost production and higher production rates.

**Keywords:** Biofloc, *Oreochromis mossambicus*, Rice bran, Wheat flour, Molasses