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**Controlling Water Quality through a Biofloc Technology (BFT) in Aquaculture Production Systems**

**Maduka K.L.W.T.<sup>1</sup>, Epasinghe E.D.M.<sup>1\*</sup>, Idroos F.S.<sup>2</sup>**

<sup>1</sup>*Aquaculture Research Centre, National Aquatic Resources Research and Development Agency, Colombo, Sri Lanka*

<sup>2</sup>*Centre for Water Quality and Algae Research, Department of Zoology, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*

*\*edmepasinghe@gmail.com*

**Abstract**

Information on dynamics of water quality is essential in fish rearing. The use of biofloc technology (BFT) improves fish production in regions with low water availability. This study was carried out to evaluate the use of locally available carbon sources to control total ammonia nitrogen and other water quality parameters in aquaculture production system. Completely randomized design was carried out with three different carbon sources (wheat flour, rice bran and molasses) and four different treatments [wheat flour (WF), rice bran (RB), molasses (MOL) and rice bran and molasses mix in 1:1 ratio (MIX)]. Each treatments had three replicates. Control tanks were maintained excluding additional carbon sources. Carbon to Nitrogen ratio was 10:1. The experiment was carried out in 80 L, fiber glass (15) tanks with indoor conditions for 60 days. A number of 30 male guppy (*Poecilia reticulata*) individuals were stocked in each tank (mean weight  $0.1481 \pm 0.0500$  g and standard length  $1.8 \pm 0.2$  cm). Water quality parameters; pH, dissolved oxygen (DO) and temperature were measured on daily basis. Total ammonium nitrogen, nitrite and nitrate were measured on weekly basis. The total ammonium nitrogen in the control ( $1.1746 \pm 0.1709$  mg/L) was significantly higher than the biofloc treatments ( $p < 0.05$ ). Control ( $0.0897 \pm 0.0374$ ) and wheat flour treatment ( $0.0939 \pm 0.0152$ ) showed a significantly higher nitrite values than other BFT treatments ( $p < 0.05$ ). Nitrate in control ( $1.1871 \pm 0.1331$ ) and wheat flour ( $0.3779 \pm 0.1044$ ) treatment showed a significantly high values than other BFT treatments ( $p < 0.05$ ). DO, pH and temperature variation was similar among the BFT groups ( $p > 0.05$ ). Overall results indicated that there is a significant effect which led to a paramount balance of standard water quality in aquaculture production system through different carbon sources (ricebran, molasses and ricebran:molasses mix) based biofloc system.

**Keywords:** Water quality, Carbon sources, Carbon ratio, Total ammonium nitrogen, Aquaculture production systems