

ID 112

Effect of different bio filter materials on water quality and growth performance of *O. niloticus* reared in a simple recirculating system

D.M.S.I. Gunadasa^{1*}, K. Radampola¹, K.S.S. Atapaththu²

¹Department of Fisheries and Aquaculture, Faculty of Fisheries and Marine Sciences & Technology, University of Ruhuna, Sri Lanka.

²Department of Limnology & Water Technology, Faculty of Fisheries and Marine Sciences & Technology, University of Ruhuna, Sri Lanka.

Abstract

Bio filter is an essential component of the Recirculatory aquaculture system (RAS), which is an environmentally friendly culture system used in aquaculture industry. The present study evaluated the effect of different bio filter materials on water quality and growth performance of *O. niloticus* reared in a simple recirculating system. Control treatment (CT- with no bio filter) and three treatments using bio filters with different filter material ie: PC (Lids of plastic pet bottles), BB (bio balls), and RT (clay roof tiles) were maintained for 35 days. Each treatment had three replicates (12 tanks). Six fingerlings of *O. niloticus* (1.54±0.54g) were stocked in each tank (21.6 L). CT tanks were supplied with continuous aeration and water was partially exchanged every three days. Bio filters were operated for 24h with no water exchange during whole period. Growth and feed performance of fish and water quality parameters, (Temperature, DO, pH, Ammonia, Nitrite, Nitrate, phosphate, Ca²⁺ Hardness, Salinity, TDS, Conductivity) were analyzed throughout the study period. Final body weights (12.23±2.62 - 14.36±4.70g) and lengths of fish (9.10±0.73 - 9.30±1.06 cm) were not significantly different among treatments. CT showed significantly lower %ADG, %SGR and higher FCR values compared to that of fish in all bio filter treatments. Ammonia concentration of water in CT was ranged between 0.57±0.04 - 1.77±0.07 mg. Ammonia-N and nitrite-N were increased during first 7 days and then started to decrease in all bio filter treatments. However final nitrate-N in all Bio filter tanks (PC-14.39 ±1.80 mg/L, BB-12.59 ±0.38 mg/L, RT-12.92 ±0.34 mg/L) were significantly higher at the end of study period compared to CT treatment (1.71 ±0.15 mg/L). Conductivity, phosphate, salinity (ppt), TDS (g/L) and Ca²⁺ Hardness recorded significant higher values in Bio filter treatments. DO and pH were not significantly different among treatments. Growth performance, ammonia oxidizing efficiency and water quality parameters of bio filter treatments were better compared to control treatment. The results suggests that the Lids of plastic pet bottles (PC) and Pieces of clay roof tiles (RT) could be used as an alternative filter media instead of commercially used bio balls.

Keywords: Bio Balls, Bio filter, Filter medium, Nitrification, *O. niloticus*

***Corresponding Author:** sandaka118@gmail.com