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Effect of Organic and Inorganic Fertilizers on Natural Food Composition and Performance of African Catfish (*Clarias Gariepinus*) Fry Produced under Artificial Propagation

Abstract

Demand for fish in both rural and urban areas is very high in Tanzania. In recent times, the African catfish, *Clarias gariepinus*, has gained popularity in the aquaculture sector of Tanzania. However, many aquaculture farmers face the challenge of unreliable supply of seed due to difficulties of reproducing in captivity and high larvae mortality. The study was conducted to determine the effect of organic and inorganic fertilizers on natural food composition and performance of African catfish (*C. gariepinus*) fry produced under artificial propagation. The results indicated that natural food (phytoplankton) abundance was significantly higher ($p < 0.05$) in di-ammonium phosphate (DAP) fertilizer applied tanks compared to other treatments. Zooplankton diversity was also greater in chicken manure applied tanks compared to other treatments. Individual final mean weight, weight gain and specific growth rate were not significantly different ($P > 0.05$) for DAP fertilizer and chicken manure treatments across stocking densities (5 fry/m^2 and 10 fry/m^2). However, there were significantly higher for these treatment groups than for the control group. Water quality parameters were found to be within the optimum range for both experiments. In conclusion, the study suggests that higher phytoplankton abundance can be attained with DAP fertilized tanks. It also suggests that zooplankton diversity is higher for tanks which receive applications of chicken manure. Fish growth performance was higher for tanks that received chicken manure treatment at low stocking density (5 fry/m^2). Therefore, it is recommended that for better growth and survival in aquaculture practices, catfish fry should be raised in DAP or chicken manure fertilized tanks at low stocking density (5 fry/m^2).