

WATER QUALITY ASPECTS OF WASTEWATER FROM AN INTENSIVE FISH CULTURE SYSTEM

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ABSTRACT

Wastewater including its constituent biosolid and algal chip from a sump receiving discharge from *Clarias gariepinus* tank were analyzed (in duplicates) for cations. The water chemistry of the culture water was also monitored and reported. The result revealed varied levels of the monitored minerals for the segregated components of the aquatic wastewater, which could have profound impact on aquacultural development and the environment. The mean temperature was $29 \pm 0.8^\circ\text{C}$; pH 6.75 ± 0.47 , carbon dioxide; 12.6 ± 2.75 mg/L; dissolved oxygen 10.77 ± 2.02 mg/L and ammonia 0.42 ± 0.09 mg/L all conformed with the standard recommended levels for fish health and productivity. All samples were found to be rich elements within range in calcium (1.109-1.815%), nitrogen (4.060-9.720%), phosphorus (0.240-2.440%), potassium (0.160-0.510%), magnesium (0.110-0.374%), zinc (313.9-662.0ppm), copper (51.70-102.00ppm), manganese (256.10-524.10ppm), sodium (202, 10-963.80ppm), and a somewhat low range of iron (1.00-2.00ppm). The composition of biosolid in eutrophic nutrients was 9.72%, 2.44% and 0.51% for N.P.K. respectively. Phosphorus is the limiting factor in eutrophication and its composition in the wastewater/biosolid was high enough to produce blooming. The N.P.K. levels in algae chip were 4.06%, 0.24% and 0.16% respectively. A preliminary investigation of beta-carotene and chlorophyll composition of the biosolid component in the wastewater gave 42.808mg/L chlorophyll a and 12.9mg/L of chlorophyll b and 4.3-08mg/g of beta-carotene while the bacterial load and diversity revealed a high population of coliform in all the samples indicating faecal contamination and suggesting possible health risk to fish and man on consumption of the fish.

Keywords: algae chip; biosolid; environmental pollution; wastewater.