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Evaluation of Nitrogen and Phosphorus Wastes Produced by Nile Tilapia (*Oreochromis niloticus* L.) Fed *Azolla*-Diets in Earthen Ponds

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ABSTRACT

Nitrogen (N) and phosphorus (P) wastes produced by Nile tilapia *Oreochromis niloticus* L. fed *Azolla*, an aquatic atmospheric nitrogen fixing fern, was evaluated for 90 days in pond experiment. Six isonitrogenous (29.2% crude protein) and isoenergetic (16.9 Kj · g^{-1}) diets A_0, A_{10}, A_{20}, A_{30}, A_{40} and A_{50}, containing 0%, 10%, 20%, 30%, 40% and 50% of *Azolla* meal (AM) respectively, as partial fishmeal (FM) substitutes, was provided to experimental fish. The *Azolla*-free diet A_0 served as a control. Fish specific growth rate (SGR) was higher with the control diet, the lower values being obtained in A*50*-fed fish ($P < 0.05$). Crude protein and P content in experimental fish showed similar values. Evaluation of the nutrient wasted show identical values (84.8% - 87.8% of supplied) for total P (TP); while total N (TN) discharged into ponds by fish increased significantly when AM level greater than 30% in diets ($P < 0.05$), amounting 63.9% - 74.2% of that supplied. From these findings, the fern *Azolla* could be used in diet to sustain Nile tilapia growth and as "environmentally-friendly" ingredient to limit P loss, while providing N to the field, beneficially in tropical marshland pond where this nutrient is already limiting.

KEYWORDS

Azolla; Aquaculture; Environment; Fish Meal Replacement; *Oreochromis niloticus*; Nitrogen; Phosphorus; Nutrient Balance

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