

A PRELIMINARY STUDY ON THE EFFICIENCY OF TILAPIA EFFLUENT AS HYDROPONIC NUTRIENT

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Aquaponics is a sustainable food production unit that combines a traditional aquaculture with hydroponics in a symbiotic environment. Aquaculture effluent is led to a hydroponic unit to be filtered out by the plants as vital nutrients, after which cleansed water is recirculated back to the aquaculture. The objective of the study was to probe the suitability of *Tilapia e.* Circular aquariums of about 0.2 cubic meters, were established and *Tilapia* were introduced at a rate of 10/aquarium as aquaculture unit. Hydroponic unit with *Ipomea aquatica*, planted at a rate of 25 per plot was kept above the aquariums. Two aquaponic replicates and a control were established. Water quality of the effluent and vegetative growth of *Ipomea aquatica* were measured every week; from January to March, 2017. Water quality parameters (TS, TSS, TDS, pH, EC, DO) of aquaculture effluent utilized by the hydroponic plants were analyzed statistically using paired t-test against the control set up. Correlation between the mean vegetative growth (plant height, stem circumference) and water quality parameters were evaluated with Pearson's correlation, simple linear regression and ANOVA using Minitab 17 statistical package. Pearson's correlation between TS and height ($r=0.996$, $p=0.000$), TS and circumference ($r=0.985$, $p=0.001$) showed a strong positive correlation between the variables. Significant positive linear correlation was observed between TS and plant height ($r=+0.995$), TDS and height ($r=+0.978$) as well as TSS and height ($r=+0.984$). Significant positive linear correlation was observed between TS -circumference ($r=+0.997$), TDS – circumference ($r=+0.974$) and TSS – circumference ($r=+0.934$). Significant difference in treatment and control was observed in EC ($p=0.000$), TS ($p=0.001$), and DO ($p=0.000$) but not in pH ($p=0.399$). The analysis revealed that the nutrients were absorbed by the plant from the effluent efficiently. The result recommends that *Tilapia* is a good choice for recirculating aquaponic systems.

Keywords: Aquaponics, hydroponics, effluent, *Tilapia*,

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