NITRIFYING CAPACITY OF WATER SPINACH ROOTS *(Ipomoea aquatica)* IN AQUAPONICS SYSTEM

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ABSTRACT

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The purpose of this study was to determine the effects of water spinach at its optimal density to absorb waste ammonia (NH_3), nitrite (NO_2-), and nitrate (NO_3-) optimally in order to determine its nitrifying capacity in aquaculture system as well as to increase the growth and yield of both water spinach and tilapia. For this study, IBC tank were used for the aquaponics set up where each tank had 60 tilapia. Number of spinach was used as treatment that served as a natural filter and the study was conducted for 30 days. The treatment with 40 plants (T_1) showed the highest absorption rates for ammonia, nitrite, and nitrate compared to the other treatments. Also, this treatment (T_1) had the lowest nitrification rate of 1.0024 mg/week-cm². Meanwhile treatment with 30 plants (T_2) had a nitrification rate of 2.889 mg/week-cm², and the treatment with 20 plants (T_3) exhibited the highest nitrification rate of 4.3358 mg/week-cm². These results with previous research that suggests nitrification rates decrease as the media area per unit volume increases. Overall, the findings indicate variations in nitrification effectiveness among different plant

densities, with the lowest density (T_3) demonstrating the highest nitrification rate. However, treatment with 40 plants (T_1) has the best growth of water spinach and highest survival rate of tilapia. Water quality measurements in all treatments changes in environmental conditions, specifically the weather, resulted in variations within the experiment. Factors that were monitored, including temperature, pH, and dissolved oxygen levels moved, increases and decreases, across the treatments, Ammonia, Nitrification Capacity, Aquaponics, Water Spinach Roots.

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