

**DIFFERENT BIOFILTER MEDIA AND WATER QUALITY
FLUCTUATION IN AN INTEGRATED HYBRID TILAPIA (*Oreochromis sp.*)
– LOOSE LEAF LETTUCE (*Lactuca sativa var. crispera*) PRODUCTION
SYSTEM**

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ABSTRACT

Integrated aquaculture-hydroponics systems were operated in closed recirculating system without daily discharge of water or organic matter during 35 days of culture period. During the culture period, three kinds of biofilter media (broken shells, charcoals and gravels) were evaluated for their efficiency in relation to biofilter efficiency (E), water quality and filter media economics. Specific growth rate (SGR) and survival rate of hybrid tilapia (*Oreochromis sp.*) as well as fresh weight of loose leaf lettuce (*Lactuca sativa var. crispata*) were investigated. The trickling filter combined with the nutrient film technique (NFT) accomplished the biological filtration in maintaining water quality for tilapia culture system. Results showed that pH and total ammonia nitrogen (TAN) concentration of rearing water differ significantly ($P < 0.05$) among the filter media during five weeks of experiment. There were significant differences ($P < 0.05$) among the treatments in unionized ammonia ($\text{NH}_3\text{-N}$) concentration at initial stage, third week and fourth week of the experiment. Significant differences ($P < 0.05$) were observed among treatments in biofilter efficiency (E) at the initial stage and first week of the experiment. There were significant differences ($P < 0.05$) among the treatments in nitrite ($\text{NO}_2\text{-N}$) concentration at second week and third week of the experiment. All filter media were efficient in maintaining the water quality parameters within the acceptable range for production of tilapia. However, broken shell and gravel would be more economical to be used as they are cheaper than charcoal media. No significant differences ($P > 0.05$) were observed among treatments in the water temperature, dissolved oxygen, SGR and survival rate of tilapia, as well as fresh weight of lettuce. Broken shell is recommended to be used in biofilter by having low cost and excellent filter