

Nutrient removal effectivity of seaweeds as biofilter and water pollution control in hybrid grouper aquaculture wastewater at low salinity

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Abstract

This research aims to determine the performance and nutrient removal effectivity of seaweeds species, namely *Ulva fasciata*., *Sargassum illicifolium*, *Gelidium* sp., and *Dictyota* sp. as a biofilter in hybrid grouper aquaculture wastewater at low salinity (14-17 ppt). This study used a Completely Randomized Design with 3 replications. The statistical analysis was carried out by Analysis of Variance continued with the Least Significance Difference test, and the Kruskal-Walis test with the Mann-Whitney analysis, and T-test with a confidence level of 95%. The concentrations of ammonia, nitrate, phosphate, and water quality parameters were observed every 4 days. The seaweeds removal of N and P in water, and Specific Growth Rate were also observed. The results showed that *U. fasciata* was able to remove or reduce ammonia by 75.95% and nitrate by 79.53%, which were the highest compared to other treatments, while *Dictyota* sp. was able to reduce the highest phosphate by 87.5% for 20 days. The highest SGR was achieved by *U. fasciata* at 1.91 %day⁻¹. The highest N content uptake by seaweeds was 104.4%, and the total P of 182.3% occurred in *U. fasciata*. Overall, *U. fasciata* has the highest performance and effectiveness as a biofilter that is able to reduce nutrient waste in low-salinity from grouper aquaculture, for re-circulation or before being discharged into the environment to reduce eutrophication and Harmful Algal Blooms (HABs) in open water system. The highest growth rate of *U. fasciata* can be used as food with highly nutritional and economical value. Keywords : seaweeds, biofilter, hybrid grouper, wastewater, nutrient removal