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AQUACULTURE WASTEWATER TREATMENT BY CONSTRUCTED WETLANDS PLANTED WITH *SPATHIPHYLLUM WALLISII* AT LABORATORY-SCALE

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Abstract

Untreated wastewater from aquaculture industry causes environmental pollution issues due to the high concentration of organic matter and nutrients. In this study, constructed wetlands (CWs) planted with the ornamental plants *Spathiphyllum wallisii* were established to treat aquaculture wastewater in Vietnam. Although studies on *S. wallisii* in CWs treating domestic wastewater treatment have been reported, little is known about the use of *S. wallisii* in CWs in aquaculture wastewater treatment. The results showed that the wetland planted with *S. wallisii* using gravel and rice husk (C2) had the highest COD removal rate of 92.6%, followed by the wetland planted with *S. wallisii* using gravel and coconut fiber (C1) and the wetland planted with *S. wallisii* using gravel (C3) with COD removal rates of 83.7% and 79.6%, respectively after 16 days, meanwhile the COD removal rate in the control system was only 26.5%. During the experimental period, NH_4^+-N concentrations in all the four systems decreased. After 16 days, the NH_4^+-N removal rates in the wetland C2 and C3 were above 99%. NO_3^--N concentrations slightly increased in the four systems, indicating the occurrence of nitrification. PO_4^{3-}-P concentrations fluctuated across all the four systems during the experimental period, with a notable increase observed in the wetland C1. The study demonstrated the ability of CWs planted with *S. wallisii* using rice husk and coconut fiber in combination with gravel in aquaculture wastewater treatment. This approach presents as an environmentally-friendly technology, contributing to the sustainable development of the aquaculture industry and environmental protection.

Key words: aquaculture wastewater, constructed wetlands, *Spathiphyllum wallisii*, treatment

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