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Phytoremediation Model System for Aquaculture Wastewater Using *Glossostigma elatinoides* and *Hemianthus callitrichoides*

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Abstract

The aquaculture industry has made a great contribution towards economic development of Malaysia. However, the large volume of water consumption and the wastewater discharged into the water source caused a significant environmental problem that must be controlled properly. For instance, aquaculture waste may decrease dissolved oxygen level and load high nutrient and inorganic contaminants which subsequently would cause water deterioration. Thus, to ensure the effectiveness of aquaculture practices, the suitable wastewater management approach should be acquainted. Phytoremediation, which are the application of plant-based technologies, are beginning to be accepted as sustainable and green solutions for this issue. Therefore, this research aims to explore ecological approach by developing phytoremediation model system in order to remediate inorganic pollutants produced by aquaculture industry. In this paper, the efficiency of potential aquatic plants which are *Glossostigma elatinoides* and *Hemianthus callitrichoides* to sequester cadmium and copper were investigated. To achieve this, water sample in several ponds of selected aquaculture area in Perak, Peninsular Malaysia was collected and analyzed in order to identify inorganic contaminants type and concentration. As a result, cadmium, chromium, copper, iron, lead, and zinc were among the contaminants found in the water pond. As a result phytoremediation model system was developed using two selected submerge aquatic plant species for three different concentrations (low, medium and high) of cadmium and copper. This model system was run over three different periods of time, which are week 1, week 2, and week 3. The findings of this research suggested that the capability to sequester different concentration of heavy metals for certain periods of time were varied between different species. The expected outcome of this research is to introduce cost-effective and eco-friendly technology to cater environmental pollution. Hence, having the thorough study on the effectiveness of this technology might contribute towards sustainable aquaculture practices in terms of ecological, economical, and social benefits.

Keywords: Aquaculture, Phytoremediation, Cadmium, Copper, *Glossostigma elatinoides*, *Hemianthus callitrichoides*.



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