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Phytoremediation of effluent generated by parboiling of paddy in rice mills

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Parboiled rice is gaining more popularity among Sri Lankans as it is healthier than raw rice. When paddy is parboiled, a huge amount of water is generated. Since this wastewater is high in nutrients, it may create environmental issues. This study aimed to find out a solution to overcome such issues using phytoremediation with aquatic plants. The aquatic plants, water hyacinth (*Eichhornia crassipes*), duckweed (*Lemna* sp.), azolla (*Azolla caroliniana*) and hydrilla (*Hydrilla verticillata*) were collected from fresh water ponds. The experiment was conducted with three treatments (undiluted, 50% dilution, 3-times dilution) with three replicates per each treatment. Chemical parameters, pH, Total Dissolved Solids (TDS), Electrical Conductivity, (EC) nitrate, nitrite, sulphate and phosphate of the parboiled wastewater were measured by multi-meter and colorimeter. After four weeks, EC, TDS, pH and colour were low in 50% dilution (1:1) when compared to undiluted treatment. These values were below the WHO standards for irrigation water. A dilution approach of parboiled effluent with fresh water in a 1:1 ratio (50% dilution) was best compared to other batches. In this study duckweed (*Lemna* sp.) has been selected as the best plant species to be used for phytoremediation of effluents generated in parboiling.

Keywords: Parboiled wastewater, Aquatic plants, Phytoremediation and irrigation standard

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