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Original Article

Simultaneous Reclamation of Sago Starch Processing Effluent Water and *Rhizopus oligosporus* Cultivation at Different pH Conditions

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ABSTRACT

Industrial sago starch extraction from the sago palm (*Metroxylon sagu*) generates large volumes of wastewater, known as sago effluent that is generally discharged into nearby water bodies without proper treatment. This practice has led to severe environmental pollution that prompts the development of biotechnological treatments of sago effluent. In this study, *Rhizopus oligosporus* was grown in sago effluent at several initial pHs (pH 4, 5, and 6) during submerged fermentation to determine the optimum pH for high protein fungal biomass (HPFB) production while simultaneously reducing the starch content and high organic loads of sago effluent. Our results showed that the growth of *R. oligosporus* was the highest (3.8 g/L) when the initial pH of the sago effluent was 4. The same pH also gave the best reduction of starch, biochemical oxygen demand and chemical oxygen demand of the sago effluent following the *R. oligosporus* fermentations, which were 96.70%, 89.81%, and 78.30%, respectively. In addition, nitrate concentration was found to be reduced from 0.266 to 0.257 g/L, while the nitrite level dropped from 0.040 to 0.029 g/L. The present findings presented the potential of *R. oligosporus* for the production of HPFB as well as for treating sago effluent.

Keywords: *Rhizopus oligosporus*, *Metroxylon sagu*, sago effluent, water reclamation, high protein fungal biomass (HPFB)