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Effect of biodegradation on the physical properties of palm oil mill effluent (Pome) using mixed culture of fungi (Article)

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Abstract

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This study investigated the effects of biodegradation by the mixed culture of fungi (*Pithomyces sacchari* and *Pestalotiopsis maculans*) on selected physical properties of palm oil mill effluent (POME). Mixed culture inoculum (4% v/v) was added to autoclaved and raw POME samples, which were subjected to biodegradation at 120rpm and 35°C for six days. The pH, electrical conductivity, total dissolve solids and biosolids of the digested samples were quantified at 24 h intervals. These parameters for the autoclaved sample, at the end of the digestion period, were 6.88, 4.38mS/cm, 2.28 g/L and 25.6 g/L, respectively. These values were higher than 6.34, 4.24mS/cm, 2.22 g/L and 22.87g/L L for the raw POME sample, respectively. The kinetic studies of the degradation of POME, based on the concentration of the biosolids, were also investigated. The kinetic studies show that the degradation of the raw POME sample best fits the zero order kinetic model ($R^2 = 0.96$), while the degradation of the autoclaved POME sample best fits the first order kinetic model ($R^2 = 0.83$). However, the digested POME may require further treatment in order to meet standard suitable for discharge into the water body.

Author keywords

Biodegradation First order Mixed culture Pestalotiopsis maculans Pithomyces sacchari Zero order

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