

Abstract

A method for the aerobic treatment of palm oil mill effluent (POME) was investigated in shake-flask experiments using a consortium developed from POME compost. POME was initially centrifuged at 4,000 g for 15 min and the supernatant was enriched with $(\text{NH}_4)_2\text{SO}_4$ (0.5%) and yeast extract (0.25%) to boost its nitrogen content. At optimum pH (pH 4) and temperature (40°C) conditions, the chemical oxygen demand (COD) of the effluent decreased from 10,350 to 1,000 mg/L (90.3%) after 7 days. The total bacterial population determined by plate count enumeration was 2.4×10^6 CFU/mL, while the fungal count was 1.8×10^3 colonies/mL. Bacteria of the genera *Pseudomonas*, *Flavobacterium*, *Micrococcus*, and *Bacillus* were isolated, while the fungal genera included *Aspergillus*, *Penicillium*, *Trichoderma*, and *Mucor*. When the isolated species were each inoculated into separate batches of the raw effluent, both pH and COD were unchanged. However, at 75 and 50% POME dilutions, the COD dropped by 52 and 44%, respectively, while the pH increased from 4 to 7.53. POME treatment by aerobic method is sustainable and holds promising prospects for cushioning the environment from the problems associated with the use of anaerobic systems.

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