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Full Length Research Paper

The environmental impact of palm oil mill effluent (pome) on some physico-chemical parameters and total aerobic bioload of soil at a dump site in Anyigba, Kogi State, Nigeria

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Abstract

The effect of POME on the integrity of the soil was investigated. Soil samples from the palm oil mill effluent (POME) dumpsite as well as a non-POME site were tested for physico-chemical properties such as pH, water holding capacity, available phosphorus, organic carbon, total nitrogen, mineral assay and cation exchange capacity. Furthermore, the total aerobic bacteria counts of the samples at 2, 30 and 40^{o}C were assayed. Results showed significant differences ($P \leq 0.05$) and ($P \leq 0.01$) in pH, water holding capacity, organic carbon, total nitrogen, cation exchange capacity and available phosphorus. 30^{o}C had the highest average microbial bioload ($1.64 \times 10^{9} \pm 0.2$) and so, the most favourable for growth. Bacterial counts from the POME dumpsite were found to be significantly higher ($P \leq 0.05$), ($9.6 \times 10^{8} \pm 0.1$ at 20^{o}C, $1.64 \times 10^{9} \pm 0.2$ at 30^{o}C and $1.07 \times 10^{9} \pm 0.2$ at 40^{o}C) than the counts for the non-POME soil sites ($4.5 \times 10^{8} \pm 0.3$ at 20^{o}C, $7.6 \times 10^{8} \pm 0.3$ at 30^{o}C and $5.9 \times 10^{8} \pm 0.3$ at 40^{o}C) at all the temperatures. The implications of these results on soil environment are discussed.

Key words: Environmental impact, POME, total aerobic bacteria.