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Effect of drilling wastes on urease activities and Substrate Induced Respiration (SIR) in wetland soil of delta and Bayelsa states of Nigeria

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The effect of drilling waste on urease activities and substrate induced respiration in wetland soil of Niger Delta area of Nigeria was investigated using Fadama, Mangrove and meander soils respectively. Urease activity and substrate induced respiration (SIR) were measured after 1,7,14,28,42,56,70,105 and 140 days of incubation to evaluate the effects of drilling waste on some soil biochemical parameters. Results obtained indicated that Fadama soil urease activities varied from 13.5 - 2.10mg NH4– Hg-1 dry soil in drilling waste, Mangrove soil urease activities varied from 13.5 - 2.22mg NH4– Hg-1 dry soil in drilling waste and Meander soil urease activities varied from 14.7 to 3.10mg NH4– Hg-1 dry soil in drilling waste. Also, the substrate induced respiration in Fadama and Mangrove soils ranges from 2.05 – 0.05ml and 2.98 – 0.06ml CO2/Kg/24hours drilling waste respectively. Analysis of enzyme activities indicated positive relationship between urease activities and SIR ($r = 0.78$, $p \leq 0.05$ Fadama, $r = 1$, $p \leq 0.05$ Mangrove, and $r = 1$, $p \leq 0.05$ Meander). There was also a positive relationship between 5%, 10% and 15% treatment levels in Fadama, Meander and Mangrove soils.

Keywords: Soil enzymes, Substrate induced respiration (SIR), Heavy metals, drilling waste.