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AN ASSESSMENT OF SEASONAL INFLUENCE IN A TROPICAL BRACKISH WATER MANGROVE DURING BIODEGRADATION

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ABSTRACT

Eagle Island Microcosm was used to monitor biodegradation of Bonny light crude oil (BLCO) seasonally for a period of 90 days. Solid phase continuous flow biodegradation system (SPCFBS) was applied which involved sediments from the Eagle Island River behind Rivers State University of Science and Technology, Rivers State, Nigeria and it consisted of the solid phase while the liquid phase was the same River water. BLCO was incorporated into the solid phase; positive control consisted of a microcosm with sediments that were incorporated with olive oil while the negative control consisted of a microcosm in which Bonny light crude oil was incorporated into the solid phase and sodium azide was introduced into the liquid phase. The resident heterotrophic aquatic micro flora was exposed to three different concentrations (5,000, 50,000 and 100,000 mg/kg). The percentage decrease in TPH in the test sediment over a 90-day period for the rainy and dry seasons were 30.6% and 33.5% in 5,000mg/kg; in the positive control sediment, 100% on the 60th and 90th days in 100,000mg/kg . In the test systems, there was no significant increase in microbial populations with time. The microbial population in the positive control increased with time while there was no growth in the negative control. The results suggest that all the crude oil concentrations of the sediments are biodegradable if there is an extension of the period of degradation.

Keywords: Biodegradation, Eagle Island Microcosm, Liquid Phase, Solid Phase, Micro Flora, Sediment