B324 Bench Scale Bioremediation of Crude Oil in Low Intertidal Zone

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Oil contamination of coastal areas from offshore spills usually occurs in the intertidal zone. In the present work, the effects of tide on the biodegradation processes in sandy intertidal zone were investigated and the rate of biodegradation of crude oil was predicted with nor-hopane as a biomarker. Polyethylene boxes (19cm x 24cm x 13cm) were used as microcosm. To simulate intertidal environments, each plot was repeatly filled and eluted with seawater every 12 hours. Control plot I was only contaminated with 3%(v/v) of Arabian light crude oil. Formalin (0.5%, v/v) was added to the control plot II in order to monitor abiotic hydrocarbon losses (poisoned control). Treated plot I contained only slow release fertilizer (effects of indigenous microorganisms). Treated plot II was inoculated with hydrocarbon-degrading microorganisms and slow release fertilizer. The oil extracts were analyzed by gravimetric measurements, TLC/FID and gas chromatography. At the end of the experiment, the biodegradation rate of aliphatic and aromatic in the treated plot was 50% and 27%, respectively. In the control plot, the biodegradation rate was 5.3% and 3.2%, respectively. The asphalts in the crude oil was refractory to biodegradation. Nor-hopane was used as a biomarker in these studies because the n-C17/pristane and n-C18/phytane ratios were inadequate for that purpose due to the substantial biodegradation rates of the branched alkanes. In the treated plots, TGCDHC (total GC detectable hydrocarbon)/nor-hopane ratio was found to decrease more rapidly.

B325 Isolation and Characterization of Denitrifying Monoterpene Degraders

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Enrichment cultures capable of various monoterpenes degradation under 02-free dentrifying conditions were established with ditch samples from forest, and the transformations of monoterpenes were observed in the cultures. Geraniol(4mM), linalool and nerol were totally degraded after an incubation period of 6 weeks, 4 weeks and 4 weeks, respectively. Molecular methods involved with PCR cloning and sequencing of environmental 16S rRNA genes were used for the characterization of microbial communeties of enrichment samples. From the enrichment showing positive activity for the degradation of geraniol, linalool and nerol, 22, 3 and 5, respectively, bacterial isolates were obtained.