Effectiveness of single and Microbial Consortium of locally isolated beneficial Microorganisms (LIBeM) in Bioaugmentation of oil sludge contaminated soil at different concentration

ABSTRACT

An aerated static pile ASP-bioreactor system made up of acrylic material dimension (60 $cm \times 40$ cm $\times 20$ cm)as developed to examine the potential of single and microbial consortium of LIBeM to remediate oil sludgentaminated soil at different concentration levels. Three different strains of LIBeM namely P. aeruginosa-BAS-Cr1, paucimobilis-ReTOS-Cr1 and S. maltophilia-RAS-Cr1 were used in this study was obtained from Environmental crobiology Laboratory, Universiti Malaysia Sabah. Five sets of experiment filled with 10 kg of soils contaminated th 5% and 10% of oil sludge were carried out as Treatment 1 (contaminated soil+P. aeruginosa-BAS-Cr1), eatment 2 (contaminated soil+S. paucimobilis-ReTOS-Cr1), Treatment 3 (contaminated soil+S. maltophilia-RAS-1), Treatment 4 (contaminated soil+Microbial Consortium; P. aeruginosa-BAS-Cr1+S. paucimobilis-ReTOS-1+S. maltophilia-RAS-Cr1) and Treatment 5 (contaminated soil+indigenous bacteria in soil; NA). Their ability tograde hydrocarbon in the soil was investigated during 60 days incubation periods. Physical and chemicalalyses were carried out from each of the treatment and control plot on a weekly basis to check for pH, moisturentent, temperatures and Total Petroleum Hydrocarbon (TPH). The results showed that single strain P. aeruginosa-AS-Cr1 has the highest oil degrading capacity compared to microbial consortium with 80% and 85.2% at bothncentration studied. The percentage of TPH removal by P. aeruginosa-BAS-Cr1 is 3-fold higher than NA, thusnfirmed that the addition of oil selective degrading bacteria was much better than the control plot. Highgradation of long chain alkanes were observed between the control and treatment plot suggested thatoaugmentation using single and microbial consortium had decrease the level of oil sludge in contaminated soil.