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MICROBIAL BIODEGRADATION OF CRUDE PETROLEUM OIL AS AFFECTED BY SALINITY

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ABSTRACT

The petroleum oil spills during oil extraction processes causes considerable environmental pollution. The aim of the present study was isolation and characterization of halo-tolerant petroleum oil-biodegrading bacteria to be used for bioremediation of petroleum oil contaminated non-saline and saline soil and seawater. Nineteen bacterial isolates were isolated from petrol contaminated soil on Mineral Salt Medium (MSM) supplemented with crude petroleum oil as a sole source of carbon. The total hydrocarbons biodegradation (THB) activity was determined by 2,6-dichlorophenol indophenol (2,6-DCPIP) method. The most active three isolates were identified by 16S-rRNA gene sequencing as *Bacillus axarquiensis*, *Bacillus thuringiensis* and *Bacillus cereus*. The aromatic petroleum compounds were completely degraded by the consortium of *B. thuringiensis* and *B. cereus* after only 14 days of incubation under non-saline MSM condition as appeared from the GC/MS analysis. Presence of dioxygenases genes was detected *in-silico* in the three bacterial strains as well as activity determination. *B. thuringiensis* and *B. cereus* can be effectively used individually or co-culture for petroleum oil biodegradation in the contaminated environment including sea-water and salty soil.

Key words: *B.axarquiensis*, *B.cereus*, *B. thuringiensis*, bioremediation, dioxygenases, petroleum oil.