

Isolation and preliminary characterization of hydrocarbon degrading bacteria from petroleum contaminated soils

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Petroleum hydrocarbons (PHs) are being accumulated in the environment due to a variety of anthropogenic activities and are considered as pollutants. These compounds badly affected on flora, fauna and micro-organisms. Removal of these compounds from the environment is very difficult and a costly process. It is known that certain micro-organisms are capable of degrading PHs as a natural process. Therefore, the key aim of this study was to isolate PHs degrading bacteria for potential candidates to be used in future bioremediation process. By using enrichment culture technique, eight bacterial strains were isolated from sub surface soil samples that have been exposed to petroleum hydrocarbons during long period of time. These isolates were subjected to screen their ability to degradation of diesel in petri plate assay. Out of them five bacterial strains that produced varying degrees of clear zones on diesel amended mineral salt medium were also capable to grow on diesel and kerosene amended mineral salt broth as a sole carbon source. This indicates the ability of these strains to biodegrade petroleum hydrocarbons. Increase of turbidity in mineral salt broth amended with 1% (v/v) diesel and 1% (v/v) kerosene was used as an indication for the ability of those bacterial strains to grow on diesel and kerosene. Bio chemical characterizations were done for certain PHs degrading isolates. Further studies are needed to determine whether they can degrade other petroleum hydrocarbons and their growing ability in different concentrations of various PHs, such as benzene, toluene, ethyl benzene, xylene and producing ability of bio-surfactant and bio-polymer by these bacterial strains to be employed them successful bioremediation of petroleum hydrocarbons in practice.

Key words: Petroleum hydrocarbons, biodegradation, soil bacteria, oil spills

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