



## Potentializing the Screened Hydrocarbon Degrading Bacterial Community for the Restoration of Hydrocarbon Contaminated Sites

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**ABSTRACT:** The wide spread use of petroleum products leads to contamination of soil and aquatic environment. The discovery of petroleum hydrocarbon brought a lot of relief to the world's energy requirement because of ease of sourcing and conversion. The ease of production, refining and distribution has also brought with it an ever-increasing problem of environmental pollution. One of the ways through which petroleum pollutants can be removed is by solubilization and emulsification. It is the biological factors they affect in our environment and biodegradation of petroleum and individual hydrocarbon they adversely affect the agricultural lands nearby leading to the accumulation of hydrocarbons in the soil followed by barrenness. The soil sample were collected from oil spill sites in Jaipur. These samples were screened for bacterial oil degradation using 1000ppm diesel on Bushnell and Hass salt medium. Hydrocarbon-oxidizing bacteria, fungi and algae are distributed widely in nature. Microbial activities are very important for the renewal of our environment and maintenance of the global carbon cycle. The level of petroleum hydrocarbon degradation was determined in-vitro optimization condition of hydrocarbon degradation by microbes through growth kinetics method at each 4 days interval. The substances that can be degraded or transformed by microorganisms are a huge number of synthetic compounds and other chemicals having ecotoxicological effects like hydrocarbons. So, through the study we are tackling and solving these problems so as to permit the use of microorganisms in bioremediation technologies. Study aims to isolate bacteria capable of degrading hydrocarbon. The soil samples were collected from oil spill sites in Jaipur and study emphasizes to provide a better solution for bioremediation of spilled petroleum hydrocarbons in soil ecosystems. All bacterial isolates able to grow on crude oil were isolated from various hydrocarbon contaminated sites. We isolated *Proteus* sp., *Streptococcus* sp., and *Enterococcus* sp., and tested the synergism. *Proteus* sp. was found to be the most promising. *In vitro* optimization studies revealed pH to be 7.0 and temperature 37°C and can degrade hydrocarbon till 1000ppm concentration by all the isolates. During, plasmid profiling yielding a band of 4.5 kb common for all indicates it as plasmid responsible for the hydrocarbon degradation. These organisms were studied to determine their biodegrading activities on Hydrocarbon (Diesel) as a sole carbon source using media. Results from this study clearly indicate *Proteus* sp. can be explored further for mitigation of hydrocarbon to be explored for land reclamation of oil spill site. © 2016 iGlobal Research and Publishing Foundation. All rights reserved.

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