

# Enrichment and Characterization of Hydrocarbon Degrading Bacteria from Various Oil-Contaminated Sites in Pakistan

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Accretion of polycyclic aromatic hydrocarbons in environment due to variety of anthropogenic activities has taken this ecosystem to the brink of destruction. Since the dawn of century, various physio-chemical methods have been postulated for the removal of these noxious substances. So far, microbial degradation is the most effective way to get rid of this ecological problem. Therefore, the assessment of randomly nominated soil samples from different sites of country land (Pakistan) was performed to scrutinize the proficiency of indigenous bacteria in degrading hydrocarbons (Hi-Octane, petrol, kerosene oil, and lubricating oil). The statistically based Plackett-Burman experimental design was also applied to evaluate the cultural conditions affecting degradation potency. Potential isolates were identified through biochemical and molecular analysis followed by the Gravimetric test to estimate the degradation level. In addition, the isolated strains exhibited a significant production of bio-surfactants in their cell-free condition. Five potent strains including *Streptococcus* sp., *Bacillus flexus*, *Arthrobacter* sp., *Bacillus* sp., and *Ancyclobacter rudongensis* were screened out, which have an ability to degrade and utilize kerosene oil, Hi-octane, petrol, and lubricating oil when analyzed individually. However, the bacterial consortium of all five strains (AA1-5) exhibited prodigious efficiency to degrade variety of hydrocarbons in less time.