

Degradation of Petroleum Hydrocarbons Using *Pseudomonas Aeruginosa* Isolated from Oil Contaminated Soil Incorporated into *E. coli* DH5 α Host

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Abstract : Soil, especially from oil field has posed a great hazard for terrestrial and marine ecosystems. The traditional treatment of oil contaminated soil cannot degrade the crude oil completely. So far, biodegradation proves to be an efficient method. During biodegradation, crude oil is used as the carbon source and addition of nitrogenous compounds increases the microbial growth, resulting in the effective breakdown of crude oil components to low molecular weight components. The present study was carried out to evaluate the biodegradation of crude oil by hydrocarbon-degrading microorganism *Pseudomonas aeruginosa* isolated from natural environment like oil contaminated soil. *Pseudomonas aeruginosa*, an oil degrading microorganism also called as hydrocarbon utilizing microorganism (or "HUM" bug) can utilize crude oil as sole carbon source. In this study, the biodegradation of crude oil was conducted with modified mineral basal salt medium and nitrogen sources so as to increase the degradation. The efficacy of the plasmid from the isolated strain was incorporated into *E. coli* DH5 α host to speed up the degradation of oil. The usage of molecular techniques has increased oil degradation which was confirmed by the degradation of aromatic and aliphatic rings of hydrocarbons and was inferred by the lesser number of peaks in Fourier Transform Infrared Spectroscopy (FTIR). The gas chromatogram again confirms better degradation by transformed cells by the lesser number of components obtained in the oil treated with transformed cells. This study demonstrated the technical feasibility of using direct inoculation of transformed cells onto the oil contaminated region thereby leading to the achievement of better oil degradation in a shorter time than the degradation caused by the wild strain.

Keywords : biodegradation, aromatic rings, plasmid, hydrocarbon, Fourier Transform Infrared Spectroscopy (FTIR)

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