

Isolation and identification of potential hydrocarbon degrading bacteria from petroleum contaminated soils

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Petroleum hydrocarbons are the most widespread contaminants in the environment. Identifying the diversity of microorganisms that degrade polycyclic aromatic hydrocarbons and compounds (PAHs/PACs) can be utilized in the development of bioremediation techniques. Preliminary studies have been carried out for isolation of hydrocarbon oxidizing bacteria. Few hydrocarbon oxidizing bacterial strains were isolated from Jamnagar sub-basin study area and were identified using biochemical and molecular 16S rRNA gene sequencing. Three bacterial strains were identified as *Rhodococcus* spp., and one bacterial strain was identified as *Mycobacterium* spp. and sent for confirmation to Microbial Type Culture Collection Centre and Gene Bank (MTCC), of Institute of Microbial Technology (IMTECH), Chandigarh. In another study, total 32 numbers of soil samples were collected from nearby oil and gas wells of Krishna Godavari Basin, Andhra Pradesh, which also includes some important soil samples which are fully contaminated with petroleum spills near the ONGC-Oil well in Pasarlapudi area of Krishna Godavari Basin. Isolation of hydrocarbon degrading bacteria from soil samples was carried out by using enrichment culture technique and sub cultured onto Nutrient Agar medium and stored at -70°C for studying cultural, biochemical characteristics and finally molecular 16rRNA sequencing. The molecular identification using 16S rRNA gene sequencing studies was carried out at Center for Cellular and Molecular Biology (CSIR), Hyderabad. The molecular identification of 16S rRNA gene sequencing results were found to be very interesting and these bacterial strains may prove to be novel. Few bacterial strains found to be potential petroleum degraders were identified as KG-32 *Micobacterium foliorum*, KG-33 *Bacillus licheniformis*, and KG-29 *Staphylococcus pasteurii*. The purpose of the ongoing research work is to identify and characterize predominant oil-degrading microflora that may be used as model hydrocarbon degraders or as microbial indicators of hydrocarbon contamination. The study involves the collection of soil samples from various oil/gas fields of India and the characterization of the bacteria for their hydrocarbon-degrading potential.

Biography

Mohammed Abdul Rasheed is working as a Project Scientist at National Geophysical Research Institute (CSIR), Hyderabad. He was awarded Ph.D from Osmania University, Hyderabad in 2009. He has over 9 years of R & D experience in surface geochemical prospecting of oil and gas exploration comprising of geo-microbial prospecting methods, adsorbed soil gas and carbon isotope methods at National Geophysical Research Institute (CSIR), Hyderabad. He has more than 20 research publications in National and International Journals, 17 numbers of Abstracts work in various National and International Seminars/conferences and has 16 numbers of Projects reports. He has written a chapter on "Microbial Techniques for Hydrocarbon Exploration" in Book title: Hydrocarbons.

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