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Bio-surfactant production by naphthalene degrading bacteria from oil contaminated soil samples

Shah Jiten J and Sangeetha Menon

Indian Academy Centre for Research & PG Studies, India

Introduction & Aim: The major environmental pollution of soil and water is due to hydrocarbon contamination resulting by the petrochemical industrial activities. Polycyclic aromatic hydrocarbons (PAHs) such as naphthalene are hazardous class of organic compounds produced as a result of pyrolysis of fossil fuels or other organic matter. Soil microorganisms have the ability to utilize hydrocarbons as a carbon source. The present study was aimed at isolating bio-surfactant producing bacterial strains capable of degrading naphthalene.

Methodology: Fifteen (15) oil contaminated soil samples collected from four wheeler garages and petrol stations of North Bangalore, Karnataka, India were enriched in Bushnell Haas (BH) medium with naphthalene as a sole carbon source for 7 days followed by spread plate on BH Agar (BHA) medium. Naphthalene degrading colonies obtained on BHA were purified and maintained in nutrient agar slants. The isolates were characterized up to genera by morphological and biochemical characters. Bio-surfactant production was tested in the isolates by various screening methods such as drop collapse method, emulsification activity, etc. Most efficient isolates were identified up to species by molecular characterization and analyzed for bio-surfactant production using cheap carbon sources.

Results: Fifteen naphthalene degraders were isolated from oil contaminated soil samples and were identified as members of genera *Bacillus*, *Staphylococcus*, *Enterobacter*, *Stenotrophomonas* and *Klebsiella*. Two most efficient bio-surfactant producers were identified as *Staphylococcus arlettae* and *Stenotrophomonas maltophilia*. Considerable amount of bio-surfactant production was observed by these isolates in BH medium supplemented with cheap carbon sources.

Conclusion: Naphthalene degrading isolates capable of bio-surfactant production could pave a way for effective bioremediation of oil contaminated soil and water environments.

Biography

Shah Jiten J is currently working as a Research Fellow at Indian Academy Centre for Research & PG Studies in India after completing his Masters in Microbiology. His research interest lies in the field of environmental microbiology, biotechnology, cancer biology, genetics and molecular biology.

jitenshah1193@gmail.com

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