Short Communication Journal of Environmental & Analytical Toxicology 2020
Vol.10 No.8

Surface-active agent Production and Hydrocarbon Degradation Potential Of Bacteria Strains From A Crude-Oil Polluted Soil In Ogoniland Nigeria – Onuoha Ekeoma - University of Calabar

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There has been huge regard for the utilization of biosurfactants due to their expected mechanical and natural applications and environmental agreeableness. With hydrocarbon dirtied soil being the significant wellspring of biosurfactant creating microscopic organisms, consequently, biosurfactant creation and hydrocarbon corruption capability of microbes strains from hydrocarbon contaminated soil in Ogoniland Nigeria were explored. The bacterial strain Proteus cibarius- E1 was isolated as it was found to be a potent producer of biosurfactant on mineral salt medium at 30°C for 5 days. The production process was optimized using response surface methodology (RSM) by varying the pH level, Temperature, salinity, and Glycerol concentration. The produced biosurfactant was characterized using the ninhydrin biochemical test, Fourier transform infrared spectroscopy(FTIR), and mass spectral (GC-MS) analysis. The degradative potential of the isolate on Total Petroleum Hydrocarbon was also investigated. The optimal and stable conditions for the biosurfactant production were found to be pH 7.0, temperature 37°C, Salinity 10%, and glycerol concentration 10% producing 1.8g/l was produced by Proteus cibarius. The biosurfactants produced were characterized as a lipopeptide having shown a purple complex in the presence of ninhydrin confirming the presence of free amino acid. The FT-IR chromatogram showed the presence of N-H and C-N Amine bond peaks and the GC–MS analysis identified the lipopeptide based biosurfactant as 11-Hexadecenoic acid methyl ester and trans-13-octadecenoic methyl ester fatty acids. The degradative efficiency at optimum temperature and pH for 14days was 81.5percent. These were compared to Sodium dodecyl sulphate (SDS) the positive control and dH2O the negative control having 54.85% and 3.86% degradation respectively. The ability to produce biosurfactants makes the strain promising for enhanced oil recovery. A low-cost raw material substrate is a great economic attraction of the biosurfactant and offers countless opportunities in future development. The development of a polynomial model to be used in making predictions on the response for given levels of varying factors is a major contribution to knowledge. Its application will be of immense value to the industry.

Soil defilement or soil contamination as a component of land debasement is brought about by the presence of xenobiotics (human-made) synthetic substances or other modification in the normal soil climate. It is commonly brought about by mechanical movement, agrarian synthetics or ill-advised removal of waste. The most well-known synthetic substances included are oil hydrocarbons, polynuclear fragrant hydrocarbons, (for example, naphthalene and benzo(a)pyrene), solvents, pesticides, lead, and other hefty metals. Pollution is corresponded with the level of industrialization and power of compound substance. The worry over soil pollution stems basically from wellbeing hazards, from direct contact with the tainted soil, fumes from the foreign substances, or from auxiliary defilement of water supplies inside and fundamental the soil. Mapping of sullied soil destinations and the subsequent cleanups are tedious and costly assignments, requiring broad measures of geography, hydrology, science, PC demonstrating abilities, and GIS in Environmental Contamination, just as an enthusiasm for the historical backdrop of mechanical chemistry.

In North America and Western Europe the degree of sullied land is most popular, with a large number of nations in these zones having a legitimate structure to recognize and manage this natural issue. Agricultural nations will in general be less firmly directed in spite of some of them having gone through hugeindustrialization.

This work is partly presented at 21st International Conference on Environmental Chemistry and Engineering, August 19-20, 2020 held at Paris, France