

Study of Petroleum Hydrocarbons Biodegradation and the Role of Biosurfactants Produced by Bacteria Isolated from the Lagoon of Mar Chica in This Process

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Abstract : Petroleum hydrocarbons are serious problems and global pollutants in the environment due to their toxicity, carcinogenicity and persistent organic pollutant properties. One of the approaches to enhance biodegradation of petroleum hydrocarbons is to use biosurfactant. Biosurfactants are amphiphilic biomolecules produced as metabolic by-products from microorganisms they received considerable attention in the field of environmental remediation processes such as bioremediation. Biosurfactants have been considered as a desirable alternative to synthetic surfactants in various applications particularly in the environmental field. In comparison with their synthetic counterparts, biosurfactants have been reported to be less toxic, biodegradable and persistent. In this study we have investigated the potential of bacterial strains collected aseptically from the lagoon Marchika (water and soil) in Nador, Morocco; for the production of biosurfactants. This study also aimed to optimize the biosurfactant production process by changing the variables that influence the type and amount of biosurfactant produced by these microorganisms such as: carbon sources and also other physical and chemical parameters such as temperature and pH. Emulsification index, methylene blue test and thin layer chromatography (TLC) revealed the ability of strains used in this study to produce compounds that could emulsify gasoline. In addition, a HPLC/MS was used to separate and identify different biosurfactants purified.

Keywords : petroleum hydrocarbons, biosurfactants, biodegradation, lagoon marchika, emulsification index

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