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Characterization of Biosurfactants Enhancing Kerosene Degradation

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Extended Abstract

Kerosene is a colorless flammable hydrocarbon liquid and it is obtained from the fractional distillation of petroleum [1]. It has numerous applications as fuel for jet engines, heating oil, solvent and insecticide [2]. Because of growing needs of kerosene production and extensive usage may end up with surface water contamination. Due to its high toxicity to biota, kerosene contamination requires remedial action to reduce environmental damage [3]. Biodegradation is an effective and eco-friendly method performed by hydrocarbon degrading bacteria.

Some of hydrocarbon degrading bacteria have the ability to produce extracellular compounds called biosurfactants. Based on their diverse chemical structures, biosurfactants are classified as glycolipids, lipopeptides, phospholipids, fatty acids, neutral lipids, and polysaccharide–protein complexes [4]. Biosurfactants can reduce surface tension and emulsify hydrocarbons by enhancing the bioavailability. They also have advantages over chemical surfactants by having low toxicity, being biodegradable [5] and efficient even at extreme temperature or pH conditions [6]. Therefore, characterization of biosurfactants produced by hydrocarbon degraders is of great interest especially in environmental applications [4].

This study aimed at determining biosurfactants produced by kerosene degraders. Therefore, previously determined 19 kerosene degraders were primarily screened for their biosurfactant productivity against kerosene. In order to characterize the type of biosurfactant; Phenol-H_2SO_4, Biuret, Phosphate and CTAB/Methylene Blue Agar Plate tests were performed. All the isolates showed positive responses to CTAB/Methylene Blue Agar Plate test, confirming the production rhamnolipid biosurfactants [7]. These results were also justified with Fourier Transform Infrared (FTIR) Spectroscopy.

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