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Production and Characterization of Bio Surfactant Using Renewable Substrates by *Pseudomonas fluorescense* Isolated from Mangrove Ecosystem

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ABSTRACT

This work was aimed to produce biosurfactant by Pseudomonas fluorescense MFS03 isolated from mangrove forest soil, Pitchavaram, Tamilnadu, India using renewable substrates. The maximum biomass (11.73 mg/ml) and biosurfactant production (9.23 mg/ml) was observed with coconut oil cake at 120 and 132 h respectively. Characterization of the biosurfactant revealed that, it is a glycolipid with chemical composition of carbohydrate (48.5 $\mu\text{g } 0.1\text{ml}^{-1}$) and lipid (50.2 $\mu\text{g } 0.1\text{ml}^{-1}$). The biosurfactant shows higher emulsification activity (89%) with crude oil and coconut oil (84%) among the different hydrocarbon tested. FT-IR spectrum revealed that the important adsorption bands at 3466.24 cm^{-1} , 2926.45 cm^{-1} , 1743.47 cm^{-1} , 1407.30 cm^{-1} and 1162.26 cm^{-1} indicate the chemical structure of rhamnolipid. Emulsification activity of the biosurfactant against different hydrocarbons showed its possible application in insecticide cleaning in vegetables. Monocrotophos with initial concentration of 100ppm was washed out with 10ppm concentration of the biosurfactant. From this investigation, biosurfactant production using renewable sources is economically low-cost medium and eco-friendly and the cleaning of insecticide residues in the vegetables leads the bioremediation of pesticides in the environment.

Keywords: Bio surfactant, Renewable sources, Rhamnolipid, Monocrotophos, and Emulsification.
