

BIOSURFACTANT-PRODUCING BACTERIA FROM AN OIL-CONTAMINATED MANGROVE

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ABSTRACT

Petroleum hydrocarbons are hydrophobic and toxic compounds with carcinogenic and mutagenic characteristic. In mangrove, since such compounds are stable over time, they pose an environmental risk. Biosurfactants are amphiphilic molecules consisting of a hydrophilic and a hydrophobic domain. These compounds are capable of reducing surface and interfacial tension between liquids, solids and gases, thus allowing them to mix or disperse readily as emulsions in water or other aqueous liquids. Such emulsions provide the initial condition for biodegradation. In this study, bacteria were isolated from sediments of a contaminated mangrove in São Paulo State (Brazil). Samples were collected in an oil spill area at three different depths (0-5 cm; 5-10 cm; 10-20 cm). Experiments were conducted in mineral liquid media with 0.1% crude oil and 0.2% NaCl at 28°C for 10 days. Surface tension and emulsion activity were measured using petroleum ether as hydrocarbon. The taxonomic identification of these bacteria strains was carried out by fat acid analysis (FAME) using gas chromatography. Eleven strains were isolated with reduced surface tension. Only one strain of *Pseudomonas stutzeri*, SO-3C-5, produced water/oil emulsifications, with a stable halo of 1.2 cm. Strains that can grow in the presence of petroleum and its derivatives, and that also produce biosurfactants, are important in studies on biodegradation and bioremediation, especially in mangroves, which are especially susceptible to petroleum contamination.