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## Biosurfactant mediated crude oil bioremediation through well characterized marine bacterium Staphylococcus spp

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Bioremediation of crude oil was achieved by glycolipid biosurfactant produced by marine bacterium Staphylococcus spp isolated from the petroleum hydrocarbon contaminated site cuddalore district, Tamil Nadu, India, through the standard screening and extracting procedure. The optimized physico-chemical conditions for the maximum production of biosurfactant was 30h incubation, pH 7.0, 35°C temperature, 20ppt salinity, 3% glucose and 1.5% yeast extract as carbon and nitrogen sources respectively and ionic supplements of 0.3% $K_2HPO_4$, 0.1% $FeSO_4$, 0.3% $CaCO_3$, 0.2% $MgSO_4$, 0.2% $ZnSO_4$. Extracted partially purified biosurfactant showed broader stability over a wide range of pH 2-10, temperature up to 70°C, salinity up to 50ppt shows the ability to withstand almost of the environmental condition and nil antimicrobial activity against bacterial and fungal strains pre-isolated from coral reef sediment and water samples shows the indigenous microorganism may not harmed therefore the fertility of the environment. Biosurfactant mediated bioremediation was carried out in conical flask using petroleum hydrocarbon pollutant and reef sediment consortium, biosurfactants solubilize the pollutants was used as sole source of carbon and energy by consortia confirmed by turbidometric, CFU and protein content in the media and was compared with the controls. From our study, isolated biosurfactant has unique property on its emulsification activity, broader stability and must provide promising environmental friendly treatment technologies for the remediation of hydrocarbons in future.

### Biography

Senthil Balan S is a Research Scholar doing PhD in Marine Microbiology, Annamalai University, Tamil Nadu, India. Also holding a category as SRF in ongoing DBT project previously worked in DRDO project for a period of 2 years and totally has a research experience of 5 years. He finished his UG, PG, M.Phil and doing PhD in Microbiology in well and reputed institutes. Published 3 paper and now 3 papers in review with good impact factors. His keen interest is on bioluminescence and biosurfactant.

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## Exploring endophytic diazotrophic bacteria as potential plant growth promoters and biocontrol agents of rice sheath blight disease

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The interior of plants provides habitat for a wide range of bacteria and fungi that benefit the plant host by increasing nutrient acquisition, stress tolerance, pathogen resistance, and aiding in phytoremediation of environmental pollutants and are termed "endophytes" that spend a significant part of their life cycle within plants without causing any harm. Although endophytes can increase plant growth through a variety of mechanisms, an especially intriguing method of growth promotion is through providing fixed nitrogen. The present study isolated 17 diazotrophic endophytic bacteria from surface sterilized rice (Oryza sativa) plants and screened for their ability to antagonize Rhizoctonia solani, the rice sheath blight pathogen. Molecular characterization of two promising strains was done by 16 S rDNA analysis and was identified as Lysinibacillus sphaericus and Bacillus cereus. They were subjected to qualitative analysis in order to find out the possible mechanisms of biocontrol potential such as production of siderophore, HCN, salicylic acid, volatile and non volatile compounds, biosurfactant and lytic enzymes. The plant growth promoting properties like IAA production, ammonia production, phosphate solubilization and the vigor index were also studied to check seed germination efficacy. Lysinibacillus sphaericus showed HCN and IAA production while Bacillus cereus showed lytic enzyme activities. Both were excellent seed germination promoters. Endophytic nature and colonization ability of the isolates were proved by plant inoculation methods with antibiotic sensitivity profile as marker. 'nif' gene analysis was also done to confirm the diazotrophy of the isolates.

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