

## Potential Use of Spore-Forming Biosurfactant Producing Bacteria in Oil-Pollution Bioremediation

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**Abstract :** Oman is one of the oil producing countries in the Arabian Peninsula and the Gulf region. About 30-40 % of oil produced from the Gulf is transported globally along the seacoast of Oman. Oil pollution from normal tanker operations, ballast water, illegal discharges and accidental spills are always serious threats to terrestrial and marine habitats. Due to Oman's geographical location at arid region where the temperature ranges between high 40s and low 50s Celsius in summers with low annual rainfall, the main source of fresh water is desalinated sea and brackish water. Oil pollution, therefore, pose a major threat to drinking water. Biosurfactants are secondary metabolites produced by microorganisms in hydrophobic environments to release nutrients from solid surfaces, such as oil. In this study, indigenous oil degrading thermophilic spore forming bacteria were isolated from oil fields contaminated soil. The isolates were identified using MALDI-TOF biotyper and 16s RNA. Their growth conditions were optimized for the production of biosurfactant. Surface tension, interfacial tensions and microbial oil biodegradation capabilities were tested. Some thermophilic bacteria degraded either completely or partially heavy crude oil (API 10-15) within 48h suggesting their high potential in oil spill bioremediation and avoiding the commonly used physical and chemical methods which usually lead to other environmental pollution.

**Keywords :** bacteria, bioremediation, biosurfactant, crude-oil-pollution

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