

## Biodegradation of Crude Oil by Natural Microbial Communities Comprising *Aspergillus* and *Bacillus* Species

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**Background:** Petroleum contamination is a global concern and various microbial genera have been tested in bioremediation of crude oil contaminations worldwide.

**Objective:** Present study aims to evaluate natural microbial communities in degradation of crude oil in liquid culture at different temperatures.

**Methods:** Three natural fungal-bacterial communities, C1, C2, C3 (comprising different isolates of *Aspergillus* sp. and *Bacillus* sp.) previously isolated from a municipal landfill, were grown on Bushnell and Haas medium with 1% sterile crude oil and incubated for seven days at 30 °C and 40 °C, respectively. Experiments were done in triplicate. Disintegration / removal of the oil layer was visually observed by comparison to a negative control devoid of the microbial inoculum.

**Results and Discussion:** The removal of the oil layer, after 7 days at 30 °C, was highest in C3 (no remaining oil was visually observed), whereas at 40 °C it was highest in C1 (almost all the oil removed). At both temperatures, C2 showed the lowest efficiency. The efficiency of C1 was similar at both temperatures. C3 formed a well spread fungal-bacterial biofilm over the oil-water interface at 30 °C compared to C1 and C2, which may explain its efficiency.

**Conclusions:** The highest efficiency in biodegradation of crude oil was observed by C3 community at 30 °C, while C1 was also efficient at 30 °C. Therefore it can be concluded that C1 and C3 communities are suitable bioremediation agents at 30 °C, which is cost effective at local climatic conditions.