

Isolation and Identification of Oil Degrading Fungi from the Rhizosphere Soil of *Crotalaria retusa* Grown in Soil Contaminated with Used Lubricating Oil

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Abstract

Contamination of soil with used lubricating oil (ULO) is one of the major environmental issues worldwide that has not been fully attended. Unsafe disposal of ULO create negative impact on life on earth due to its major chemical constituents, hazardous polycyclic aromatic hydrocarbons (PAHs) and toxic heavy metals. Bioremediation, that uses microorganisms is one of the most promising technologies with increasing demand for the remediation of ULO contaminated soil and water because pollutants can be degraded efficiently at low cost in an ecofriendly way. The aim of the present study was to isolate and characterize ULO degrading fungi from ULO contaminated soil. Ten morphologically distinct fungi were isolated from the rhizosphere of *Crotalaria retus* grown in ULO contaminated soil. Briefly, rhizosphere soil was serially diluted and grown on mineral salt agar (MSA) medium supplemented with 10,000 mg kg⁻¹ of ULO per plate. The ULO was provided as the sole source of carbon and energy. Isolates with ULO degradation potential were identified by formation of clear zone surrounding fungal growth. The two most efficient ULO degrading isolates, RUH 6 and 7 were identified as *Fusarium solani* and *Aspergillus nidulans* respectively, using colony characters and sequencing of internal transcribed spacer region (ITS) spanning the ITS1, 5.8s and ITS2 regions in the ribosomal RNA operon. The efficiency of ULO degradation by two isolates were further analyzed by using a gravimetric method in MS broth medium supplemented with 1g of ULO. *Fusarium soani* RUH 6 and *Aspergillus nidulans* RUH 7 were capable of degrading 73.5% and 76.4% of ULO, respectively. This study signifies the potential of using *Fusarium solani* RUH 6 and *Aspergillus nidulans* RUH 7 isolates for efficient remediation of ULO contaminated soil and highlight future directions for *in vivo* application.

Keywords: *Aspergillus*, Bioremediation, *Fusarium*, PAHs, ULO

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