ISOLATION AND IDENTIFICATION OF PETROLEUM DEGRADING FUNGI AND BACTERIA FROM PETROLEUM CONTAMINATED SOIL

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In order to isolate petroleum degrading microorganisms, four soil samples were collected from four sites, which were exposed to petroleum for a long time. Seven fungal species and six bacterial species were isolated from those soil samples. Biodegradation ability of these microorganisms was tested on most common petroleum products in Sri Lanka, namely kerosene oil, petrol, diesel and engine oil. To measure the degrading ability, turbidity test was used. The turbidity of fungi was assessed by measuring the optical density at 600nm and the turbidity of bacteria was measured at 560nm. Three fungal species and three bacterial species which showed maximum degrading ability were selected for identification.

Fungal species were identified by microscopic characteristics of their reproductive structures. The characters were compared with existing data and the fungi were identified to the genus level as *Mucor sp, Paecilomyces sp* and *Aspergillus sp*. Bacterial identification was done by using rDNA sequence. A segment of rDNA was amplified by polymerase chain reaction using a universal primer pair and the resulting product was subjected to sequencing. The sequences were compared with the sequences in NCBI data bases. Two of the bacterial species were identified as *Bacillus megaterium* and *Pseudomonas* species whereas the third one was a reported, yet an unidentified species.

Experiments were conducted to identify better combinations of bacterial and fungal species in petroleum degradation. Every pair of fungi and bacteria was tested separately. By analyzing data, fungal species 1, species 2, species 4 and species 6 was selected as the best combination to use in petroleum degradation. For bacteria the best combination was species 1, species 2, species 3 and species 5.