

UNIVERSITI TEKNOLOGI MARA

**SCREENING OF BACTERIA FROM
CONTAMINATED SOIL FOR THE
BIOREMEDIATION OF PETROLEUM
HYDROCARBON**

NOR AISHAH ABDULLAH

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ABSTRACT

Microorganisms are ubiquitous, present almost everywhere. Various microorganisms can be found in the soil. Some of these microorganisms are capable of degrading petroleum hydrocarbons that contaminate the soil when oil tankers or pipes leaked. Petroleum consists of complex compound mixtures such as alkenes and aromatic hydrocarbon. These potential compounds could be eliminated by microbial remediation under suitable condition such as neutral pH, ambient temperature and presence of oxygen. Bioremediation of petroleum hydrocarbons is a complex process that depends on nature and amount of hydrocarbons present in the medium. It is a natural process that does not cause any harm to other organisms and also known as an alternative in cleaning oil spills because the cost is much lower than conventional methods. The purposes of this study are to screen the bacteria that are capable in degrading petroleum hydrocarbons, characterize them and identify the bacterial species. Soil samples were taken from workshops area at Jalan Mantap 25/126, Seksyen 25 Shah Alam. Samples were first enriched to increase the number of bacteria present. Spread plate method was used to isolate the bacteria. This was followed by streak plate method to obtain a single colony of each isolate. A total of 11 isolates were obtained and characterized by Gram staining and confirmed by database of bacteria species in Biolog system. After the screening process the strains undergone bioremediation to degrade total petroleum hydrocarbon in contaminated soils. The utilization of hydrocarbon after the treatment was detected by using GC-MS. All strains were capable to degrade tetradecane effectively compared to other compounds. From the findings, it shows that the strains of *Pseudomonas aeruginosa*, *Acinetobacter baumannii* and *Pseudomonas putida* degraded hydrocarbon in soil significantly. The greatest bioremediation was performed by *Pseudomonas aeruginosa* with 41% of hydrocarbon followed by *Pseudomonas putida* with 30% of hydrocarbon and finally *Acinetobacter baumannii* with 29% of hydrocarbon after three months of incubation. These bacteria are found to be efficient to degrade petroleum hydrocarbons by utilizing them as their nutrients, carbon and energy sources.

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