

ISOLATION AND IDENTIFICATION OF AMOEBAE FROM  
UNDERGROUND WATER CONTAMINATED WITH  
PURE CONDENSATE PETROLEUM

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**ISOLATION AND IDENTIFICATION OF AMOEBAE FROM UNDERGROUND  
WATER CONTAMINATED WITH PURE CONDENSATE PETROLEUM**

**By**

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**JABATAN SAINS BIOLOGI  
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**PENGAKUAN DAN PENGESAHAN LAPORAN  
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:  
Isolation and Identification of Amoebae from Underground  
Water Contaminated with Pure Condensate Petroleum.

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## LIST OF ABBREVIATIONS

+	present
-	absent
-	to
UV	Ultra Violet
KUSTEM	Kolej Universiti Sains dan Teknologi Malaysia
DOE	Department of Environment
OUST	Office of Underground Storage Tank
EPA	Environmental Protection Agency
RPs	responsible parties
TAHs	total aliphatic hydrocarbons
PAHs	poly aromatic hydrocarbons
CCAP	the Culture Collection of Algae & Protozoa
PAS	Page's ameba saline
PBS	phosphate buffered saline
NNA	non-nutrient agar
NA	Nutrient Agar

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## ABSTRACT

In this study, free-living amoebae were isolated and identified from underground water contaminated with pure condensate petroleum. The amoebae were also tested to see if they were capable of using the crude petroleum as their food and energy sources. The effect of different concentration of crude petroleum on amoeba *Acanthamoeba castellanii* CCAP 1501/2A in liquid medium was also investigated everyday for three days. There are at least two species of amoebae have been isolated and identified from this underground water, and they are Species A and *Hartmannella* sp. The identification of amoebae was based on their morphology, locomotion, cysts and trophozoites following key of Page (1988). No amoebae used in this study was observed to be capable of using crude petroleum as their food source since no apparent effect on the crude petroleum layer on the agar consumed by the amoebae. The different concentration of crude petroleum gives a significant effect on the amoeba growth ( $p < 0.05$ ). The amoeba population was decreased in number during treatment with crude petroleum. The higher concentration of the crude petroleum used, the more effect to the amoeba growth was observed.

**PENGASINGAN DAN PENGENALPASTIAN  
AMOEBA DARI AIR BAWAH TANAH YANG DICEMARI OLEH  
'CONDENSATE PETROLEUM' TULEN**

**ABSTRAK**

Dalam kajian ini, amoebae yang hidup bebas di dalam air bawah tanah yang telah dicemari oleh 'condensate petroleum' tulen diasing dan dikenalpasti. Amoeba itu juga diuji samada ia boleh menggunakan petroleum mentah sebagai sumber makanan dan tenaga kepadanya atau tidak. Kesan berlainan kepekatan petroleum mentah keatas *Acanthamoeba castellanii* CCAP 1501/2A dalam media cecair juga dilihat setiap hari selama tiga hari. Terdapat sekurang-kurangnya dua spesies amoeba yang telah diasing dan dikenalpasti dari air bawah tanah tersebut iaitu Spesies A dan *Hartmannella* sp.. Pengenalpastian amoeba adalah berdasarkan kepada morfologi, pergerakan, rupa bentuk sista dan juga trofozoit mengikut kekunci Page (1988). Tiada satu amoeba pun yang digunakan dalam kajian ini berkebolehan menggunakan petroleum mentah sebagai sumber makanannya kerana tidak ada sebarang kesan pada lapisan petroleum mentah di atas agar dimakan oleh amoeba. Kepekatan petroleum mentah yang berbeza memberikan kesan yang ketara ke atas pertumbuhan amoeba. Bilangan amoeba dilihat semakin berkurangan semasa diujikaji dengan petroleum mentah. Semakin tinggi kepekatan petroleum mentah, semakin tinggi kesannya ke atas pertumbuhan amoeba.