# IDENTIFICATION AND CHARACTERIZATION OF BACTERIA FROM FRESHWATER FISH (*Osteochilus hasselti*)

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Identification and characterization of bacteria from freshwater fish (Osteochilus hasseltii). / Nur Maizura Abdul Malik.

# IDENTIFICATION AND CHARACTERIZATION OF BACTERIA FROM FRESHWATER FISH (*Osteochilus hasseltii*)

By

**Nur Maizura binti Abdul Malik**

**A thesis submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of Science ( Biological Sciences )**

**DEPARTMENT OF BIOLOGICAL SCIENCES**
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## PENGAKUAN DAN PENGESAHAN LAPORAN PITA I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: IDENTIFICATION AND CHARACTERIZATION OF BACTERIA FROM FRESHWATER FISH (*Osteochilus hasseltii*) oleh NUR MAIZURA BINTI ABDUL MALIK, no. matrik: UK12277 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah SARJANA MUDA SAINS (SAINS BIOLOGI), Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

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## DECLARATION

I hereby declare that this thesis entitled Identification and Characterization of bacteria from freshwater fish ( *Osteochilus hasseltii* ) is the result of my own research except as cited in the references.

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# ABSTRAK

Bakteria boleh menyebabkan banyak penyakit kepada organisma dan juga boleh menjadi petunjuk kepada pencemaran seperti persekitaran air tawar. Telah banyak kajian telah di lakukan untuk mengenalpasti jenis bakteria patogen pada ikan air tawar tetapi hanya sedikit kajian yang telah di lakukan untuk mengenalpasti bacteria yang boleh dijadikan petunjuk biologi kepada kualiti air. Oleh itu, kajian ini telah dilakukan untuk menentukan kualiti air kualiti air di Paya Sungai Udang dengan menggunakan bakteria dari ikan air tawar dari spesies *Osteochilus hasseltii* sebagai petunjuk biologi. Sampel *O. hasseltii* telah di ambil dari Paya Sungai Udang di Kuala Berang, Terengganu yang telah tercemar. Kawasan ini telah tercemar dengan air larut resap dari air bawah tanah yang mengalir dari tapak pembuangan sampah yang berhampiran. Bakteria dari spesies ikan air tawar ini telah dipencilkan di atas dua jenis agar iaitu agar nutrient dan agar MacConkey. Semua bakteria yang telah dipencilkan telah di kenalpasti melalui ciri morfologi dan fisiologi dengan menggunakan beberapa jenis ujian biokimia dan pewarnaan gram. Ujian biokimia yang digunakan dalam kajian ini ialah Oksidase, Katalase, Metil Merah, Voges-Proskauer, SIM, TSI dan hidrolisis kanji. Keputusan yang didapati dari kajian ini menunjukkan 96% bakteria yang dipencilkan adalah Gram-negatif dan 4% adalah Gram-positif. Antara genus yang telah dikenalpasti dari *O. hasseltii* adalah *Neisseria* sp., *Enterobacter* sp., *Serratia* sp., *Veillonella* sp., *Megasphaera* sp., *Pseudomonas* sp. dan *Staphylococcus* sp. Keputusan yang didapati dari kajian ini menunjukkan kawasan ini telah tercemar dengan bakteria patogen yang biasanya dijumpai pada manusia dan ini boleh di simpulkan bahawa air di kawasan tersebut adalah tercemar.

## ABSTRACT

Bacteria can cause many diseases to the organism and also can be as indicator to the pollution of environment such as freshwater. A very vast number of studied have been done to identify the types of pathogenic bacteria in freshwater fish but only a few studied were done to identify the types of bacteria that can be as a bioindicator to the water quality. Therefore, these studies were done to determine the water quality at Paya Sungai Udang by using bacteria from freshwater fish *Osteochilus hasseltii*. The samples of *O. hasseltii* were collected from the polluted area in Paya Sungai Udang at Kuala Berang, Terengganu. These areas were polluted by a leachate from groundwater from the nearby landfill. The bacteria from this kind of freshwater species have been isolated and cultured on two types of agar which are Nutrient agar and MacConkey agar. All the isolated bacteria have been identified with morphology and physiology characteristics by using a few biochemical tests and Gram-stained. Biochemical test used in this study are Oxidase, Catalase, Methyl Red, Voges-Proskauer, SIM, TSI and Starch hydrolysis test. Results obtained from this study including 96 % of the isolates are from the Gram-negative group of bacteria and the rest 4 % are from the Gram-positive group of bacteria. Genus that already identified from the *O. hasseltii* were *Neisseria* sp., *Enterobacter* sp., *Serratia* sp., *Veillonella* sp., *Megasphaera* sp., *Pseudomonas* sp. and *Staphylococcus* sp. Results obtained from this study indicated that area were polluted with some of the pathogenic bacteria that can be found in human and also can be concluded that the water at that area are polluted.