

BACTERIOLOGICAL STUDY IN ASSOCIATION WITH ANTIBIOTIC  
RESISTANCE AND HEAVY METAL OF BACTERIAL  
POPULATION FROM GIANT FRESHWATER  
PRAWN LARVAE WASTE

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**Bacteriological study in association with antibiotic resistance and heavy metal of  
bacterial population from Giant freshwater prawn (*Macrobrachium rosenbergii*)  
Larvae Waste**

**By  
Nur Idayu Bte Maruan**

**Research Report submitted in partial fulfillment  
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**FAKULTI AGROTEKNOLOGI DAN SAINS MAKANAN  
UNIVERSITI MALAYSIA TERENGGANU**

**PENGAKUAN DAN PENGESAHAN LAPORAN  
PROJEK ILMIAH I DAN II**

Adalah ini diakui dan disahkan bahawa laporan ilmiah bertajuk:

Bacteriological study in association with antibiotic resistance and heavy metal of bacterial population from Giant freshwater prawn (*Macrobrachium rosenbergii*) Larvae Waste

oleh..... **Nur Idayu Bte Maruan** ....., No.Matrik **UK 15284** ..... telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan **Sain Perikanan dan Akuakultur** ..... sebagai memenuhi sebahagian daripada keperluan memperoleh **Ijazah Sarjana Muda Sains Agroteknologi (Akuakultur)** ....., **Fakulti Agroteknologi dan Sains Makanan, Universiti Malaysia Terengganu.**

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## DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged

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Date : 16 May, 2009 .....

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## ABSTRACT

A study was carried out to determine bacterial count on larvae waste of Giant freshwater prawn (*Macrobrachium rosenbergii*) collected from the bottom tank at University Malaysia Terengganu Marine Hatchery, and their resistance to various antibiotics and heavy metals. The bacteria were isolated using non-selective agar Trypticase Soy Agar (TSA) and selective agar were Thiosulfate Citrate Bile Sucrose TPC (TCBS), Mac Conkey, Pseudomonas Aeromonas Selective Agar base (GSP), Eosin Methylene Blue (EMB) and Xylose Lysine Deoxycholate (XLD). The plate counts ranged from  $7 \times 10^2$  to  $1.53 \times 10^4$  bacterial per disc for larvae waste of *M.rosenbergii*. The bacteria genera found on larvae waste were *Vibrio*, *Pseudomonas*, *Aeromonas* and *Escherichia*. This bacteria were the most frequently found encountered genera based on appearance and growth of colonies on selective agar. A total of 50 strain bacterial isolates isolated from larvae waste of *M.rosenbergii* was examined the antibiotic resistance and results showed that the bacterial resistance to lincomycin was highest followed by oleandomycin, novobiocin, spiramycin, deoxycyclin, ampicilin, amoxicillin and tetracycline. Most of the isolates were tolerant to all heavy metal test with the pattern of  $Hg = Cd = Cr > Cu$ . These results indicate that bacteria isolate resistance to antibiotic and heavy metal posing a potential public health risk.



## ABSTRAK

Suatu kajian telah dijalankan untuk menentukan bilangan bakteria pada sisa buangan larva Udang Galah (*Macrobrachium rosenbergii*) yang diperolehi daripada dasar tangki hatceri air masin Universiti Malaysia Terengganu dan ketahanannya terhadap pelbagai antibiotik dan logam berat. Bacteria dipencilkan pada media umum iaitu Trypticase Soy Agar (TSA) dan media selektif iaitu Thiosulfate Citrate Bile Sucrose TPC (TCBS), Mac Conkey, Pseudomonas Aeromonas Selective Agar base (GSP), Eosin Methylene Blue (EMB) ) dan Xylose Lysine Deoxycholate (XLD) ). Bilangan koloni bakteria yang terbentuk pada medium agar adalah di antara  $7 \times 10^2$  to  $1.53 \times 10^4$  per ml. Genera bakteria yang biasa ditemui adalah *Vibrio*, *Pseudomonas*, *Aeromona* and *Escherichia*, dimana ia ditentukan berdasarkan kemunculannya dan pertumbuhan koloni di atas agar selektif. Sejumlah 50 pemencilan bakteria yang dipencilkan daripada sisa buangan larva udang galah diperiksa ketahanannya terhadap antibiotik dan keputusan yang diperolehi mendapati ketahanan bakteria yang tinggi kepada lincomycin dengan diikuti oleh oleandomycin, novobiocin, spiramycin, deoxycyclin, ampicilin, amoxicillin dan tetracycline. Didapati pemencilan bakteria juga bertoleransi dengan semua ujian logam berat iaitu dengan pola  $Hg = Cd = Cr > Cu$ . Keputusan ini menunjukkan ketahanan bakteria terhadap antibiotik dan bahan logam berat, berisiko tinggi untuk menjejaskan kesihatan