





**BACTERIAL FLORA ASSOCIATED WITH THE GIANT FRESH WATER  
PRAWN (*Macrobrachium rosenbergii*) POST-LARVAE IN  
THE HATCHERY SYSTEM**

**By  
Arief Izzairy Bin Zamani**

**Research Report submitted in partial fulfillment of  
the requirement for the degree of  
Bachelor of Agrotechnology Science (Aquaculture)**

**Department of Fisheries & Aquaculture  
FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE  
UNIVERSITY MALAYSIA TERENGGANU  
2009**

This thesis should be cited as:

Zamani, A.I. 2009. Bacterial flora associated with the giant fresh water prawn (*Macrobrachium rosenbergii*) post-larvae in the hatchery system. Undergraduate thesis, Bachelor of Science in Agrotechnology (Aquaculture), Faculty of Agrotechnology and Food Science, University Malaysia Terengganu, Terengganu.

No part of this thesis may be reproduced by any mechanical, photographic, or electronic process, or in the form of phonographic recording, nor may it be stored in a retrieval system, transmitted, or otherwise copied for public or private use, without written permission from the author and the supervisor(s) of the project.



**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: **BACTERIAL FLORA ASSOCIATED WITH THE GIANT FRESH WATER PRAWN (*Macrobrachium rosenbergii*) POST-LARVAE IN THE HATCHERY SYSTEM**

Oleh **Arief Izzairy Zamani**, No.Matrik **UK 13792** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada **Jabatan Sains Perikanan dan Akuakultur** sebagai memenuhi sebahagian daripada keperluan memperoleh **Ijazah Sarjana Muda Sains Agroteknologi (Akuakultur )** Fakulti Agroteknologi dan Sains Makanan, Universiti Malaysia Terengganu.

Disahkan oleh:

Penyelia Utama

Nama: Prof. Madya Dr. Najiah bt. Musa

Cop Rasmi:

Tarikh: 27 April 2009

ASSOC. PROF. DR. NAJIAH MUSA @ ZAKARIA  
LECTURER  
Dept. of Fisheries & Aquaculture  
Faculty of Agrotechnology & Food Sciences  
Universiti Malaysia Terengganu (UMT)  
.....41230 ~~Mengabang~~ Telipot, Terengganu

Penyelia Kedua (jika ada)

Nama:

Cop Rasmi

Tarikh: .....

## DECLARATION

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

Signature : Arief  
Name : ARIEF IZZAHRI EDMAN  
Matric No : UF 13792  
Date : 25/5/09

## **ACKNOWLEDGEMENTS**

First of all, I would like to thank my supervisor, Dr. Najiah Musa @ Zakaria for her supervision, assistance, comments and guidance that enable this project run smoothly. Sincere thanks to Mrs. Nur Asma Ariffin for guideline. Not forgotten to Lee Seong Wei, Mohd Zarul Ariff and others for their assistance.

Besides, my thanks go to my teammates for their cooperation during lab work. Appreciation is extended to my housemates and family members for their support. Finally, my appreciation goes to those who have contributed to this project and not be mentioned.

## ABSTRACT

The objective of this study was to understand the bacterial flora associated with giant fresh water prawn, *Macrobrachium rosenbergii* (post-larvae) in University Malaysia Terengganu hatchery and its resistant towards antibiotics and heavy metals tolerance. Total of 35 isolates were collected and determined their tolerance to antibiotics and heavy metal. The isolates comprised of 8 genera, *Escherichia coli*, *Pseudomonas* spp., *Aeromonas* spp., *Vibrio* spp., *Shigella* spp., *Providencia* spp., *Enterobacter* spp., and *Klebsiella* spp. which identified by morphological typing. Total plate counts ranged from  $2.5 \times 10^4$  to  $2.76 \times 10^4$  cfu ml<sup>-1</sup>. The antibiotics test with 15 different antibiotics showed that all isolates were sensitive to Florfenicol (FFC). Multiple antibiotic resistance MAR index, 0.54 indicates that the isolates were originated from high-risk source of contamination. Heavy metals tolerance test such as Cu, Cr, Cd and Hg with 5 different concentrations showed tolerance pattern Hg = Cr > Cu > Cd. The study is very useful in contributing a preliminary data and profile of the bacteria associated with giant fresh water prawn, *Macrobrachium rosenbergii* (post-larvae).



## ABSTRAK

Objektif kajian ini ialah untuk memahami bakteria flora yang berkaitan dengan udang galah, *Macrobrachium rosenbergii* (post-larva) di hatcheri Universiti Malaysia Terengganu dan rintanganya terhadap antibiotik dan toleransi terhadap logam berat. Sejumlah 35 isolate (pemencilan) dikumpul dan diuji rintanganya terhadap antibiotik dan logam berat. Isolate terdiri dari 8 genera, *Escherichia coli*, *Pseudomonas* spp., *Aeromonas* spp., *Vibrio* spp., *Shigella* spp., *Providencia* spp., *Enterobacter* spp., dan *Klebsiella* spp. yang dikenalpasti melalui pengecaman morfologi. Jumlah pengiraan bakteria (total plate counts) adalah dari  $2.5 \times 10^4$  hingga  $2.76 \times 10^4$  cfu ml<sup>-1</sup>. Ujian antibiotik dibuat dengan 15 jenis antibiotik yang berasingan dan keputusan menunjukkan bahawa semua isolate sensitif kepada Florfenicol (FFC). Multiple antibiotic resistance (MAR) indeks, 0.54 menunjukkan bahawa isolate-isolate tersebut berasal dari kawasan berisiko tinggi mengalami pencemaran. Ujian toleransi logam berat terhadap Cu, Cr, Cd dan Hg pada 5 kepekatan yang berbeza menunjukkan corak toleransi dimana Hg = Cr > Cu > Cd. Kajian ini amat berguna dalam menyumbang serba sedikit data mengenai bakteria yang berkaitan udang galah, *Macrobrachium rosenbergii* (post-larva).