

ISOLATION AND IDENTIFICATION OF Aeromonas hydrophila  
IN AQUACULTURE FISH IN KENYIR LAKE, TERENGGANU

CHEAH ENG OON

DEPARTMENT OF BIOLOGICAL SCIENCE  
FACULTY OF SCIENCE AND TECHNOLOGY  
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA  
KUSTEM  
2003

LP  
3  
FST  
1  
2003

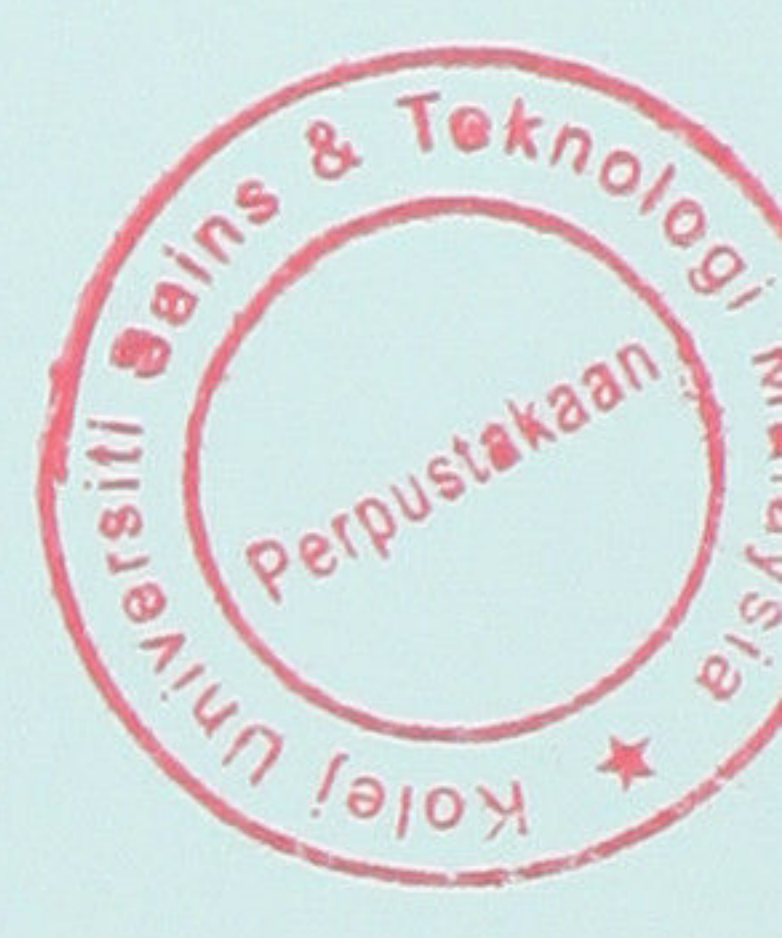
c/n 1564

1100024974

LP 3 FST 1 2003



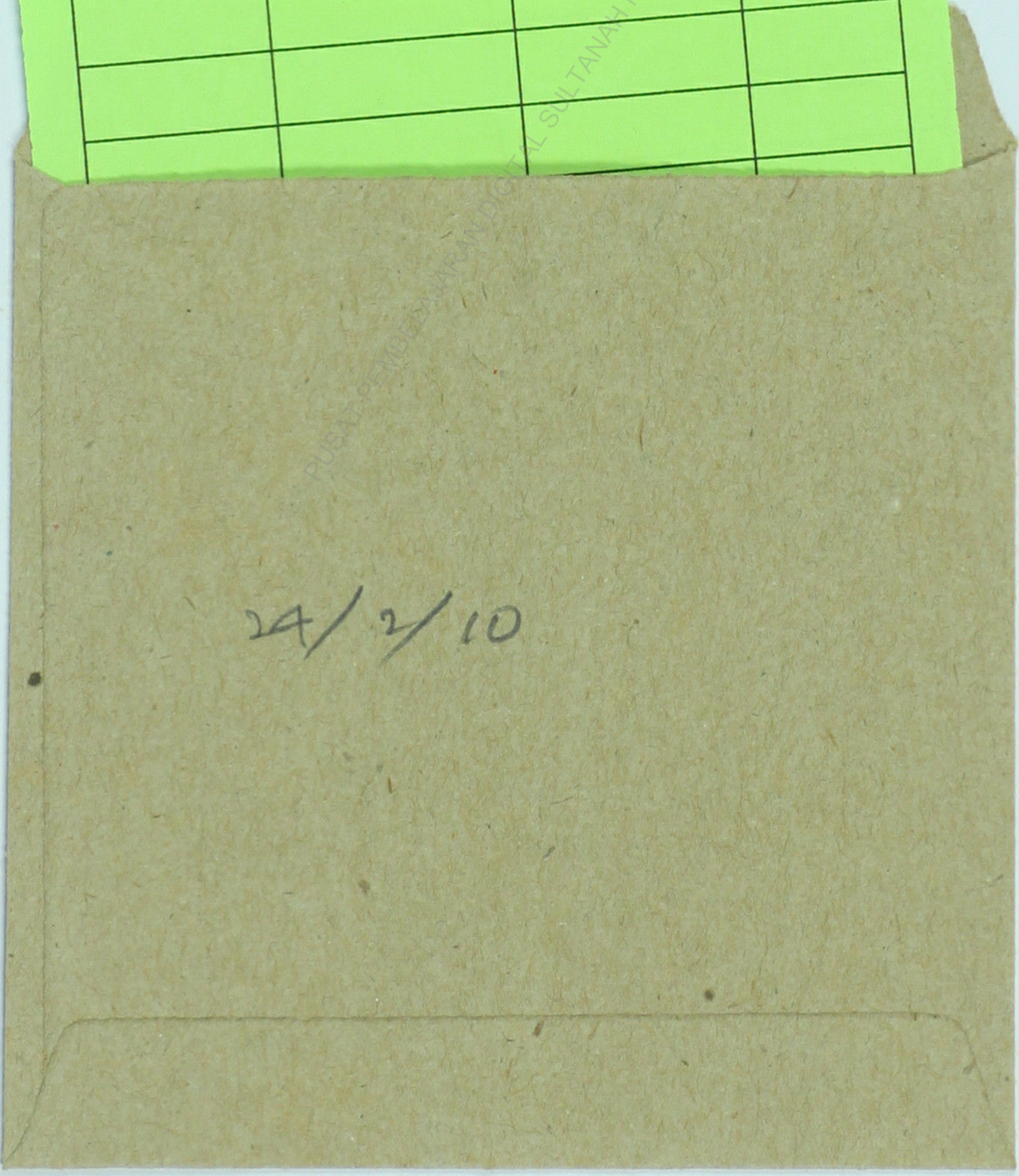
1100024974  
Isolation and identification of Aeromonas hydrophila in aquaculture fish in Kenyir Lake, Terengganu / Cheah Eng Oon.



**1100024974**

BERPUSTAKAAN  
KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA  
(KUSTEM) c/n 1564

Pengarang <b>CHEAH ENG OON</b>		No. Panggilan	
Judul <b>Isolation of ...</b>		Tanda tangan	
Tarikh	Waktu Pemulangan	Nombor Ahli	Tanda tangan
24/7/06	1.15 p.m.	U2581	<input checked="" type="checkbox"/>
8/8/06	4.35	U11016	<input checked="" type="checkbox"/>
15/11/06	2.25	U212581	



24/2/10

LP 3  
FST 1  
2003

# **Isolation And Identification Of *Aeromonas hydrophila* In Aquaculture Fish In Kenyir Lake, Terengganu**

**By:**

**CHEAH ENG OON**

**This project report is submitted in partial fulfillment of the requirements for the  
Bachelor of Applied Science  
(Conservation & Management of Biodiversity)**

**Department of Biological Science  
Faculty of Science and Technology  
Kolej Universiti Sains Dan Teknologi Malaysia (KUSTEM)  
2003**

**1100024974**

**This project report should be reference as:**

**Cheah, E.O. (2003) Isolation and Identification of *Aeromonas hydrophila* In Aquaculture Fish in Tasik Kenyir, Terengganu. Project report: Bachelor of Applied Science in Conservation & Management of Biodiversity, Faculty of Science and Technology, Kolej Universiti Sains Dan Teknologi Malaysia, Terengganu: 40 p.**

**No part of this project report may be reproduced by any mechanical, photographic, or electronic process, or in the form of photographic recording, nor mat 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 of the project.**

**KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA**

**PENGAKUAN DAN PENGESAHAN LAPORAN  
PENYELIDIKAN ILMIAH TAHUN AKHIR**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan ilmiah tahun akhir bertajuk Isolation And Identification of *Aeromonas hydrophila* In Aquacultured Fish in Kenyir Lake, Terengganu oleh Cheah Eng Oon, no. matrik UK 4146 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperoleh ijazah Sarjana Muda Sains – Pengurusan dan Pemuliharaan Biodiversiti, Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:

  
(CIK NORAZNAWATI ISMAIL)


Penyelia Utama

Nama: Cik Noraznawati Binti Ismail

Cop:

Noraznawati Ismail  
Lecturer  
Department of Biological Science  
Faculty of Science and Technology  
KUSTEM 21300 K. Terengganu

Tarikh: 27/2/2003

  
(DR. MOHD. EFFENDY ABDUL WAHID)

Penyelia Kedua

Nama: Dr. Mohd. Effendy Abdul Wahid

Cop:

DR. MOHD. EFFENDY BIN ABD. WAHID  
Lecturer

Dept. Of Biological Science  
Faculty Of Science and Technology  
University College Of Science and Technology M'sia  
Mengabang Telipot  
21030 Kuala Terengganu.

Tarikh: 27/02/2003

  
(PROF. DR. CHAN ENG HENG)

Ketua Jabatan Biologi

Cop:

PROF. DR. CHAN ENG HENG  
Ketua  
Jabatan Sains Biologi  
Fakulti Sains dan Teknologi  
Kolej Universiti Sains dan Teknologi Malaysia  
(KUSTEM)  
21030 Kuala Terengganu.

Tarikh: 3/3/03

## ACKNOWLEDGEMENT

‘With the blessings of Lord Buddha’

A year has passed since this project started. It is with a humble heart that this project can be completed in the given time. My honor and my highest respects go to both of my supervisors, Dr. Muthafar Al-Haddawi Mohamad, Cik Noraznawati bt. Ismail and my co-supervisor, Dr. Mohd. Effendy Abdul Wahid for their unconditional guidance, advice and their unmatched love and dedication as a scientist, a teacher and a friend.

A special acknowledgement and a special thank you to Prof. Dr. Son Radu, Puan Najiah, Ms. Wai Ling and everyone from the Faculty of Food and Biotechnology, UPM Serdang. I would also like to express my thanks to both of the farm keepers, Dr. Muru in the Fisheries Department fish farm and En. Razali in the RISDA fish farm situated in Kenyir Lake for giving their assistance and permission to take fish samples there.

Many thanks also go to Kak Ina, Kak Mahidawati, En. Mohd. Embong, Abang Sharol, Abang Joe, Kak Fatimah and Abang Sayed for their willingness to share their experiences and knowledge of practical laboratory work. Thank you to Abang Marzuki and everyone in the net loft for their willingness to provide transport to my sampling sites. Appreciation also go to teammates Ooi, Young and Kayal with whom I shares most of my experiences with and friends Richard, Lip Pien, Hui Yong, Choi,

Cat, Boon Siew, Shen and last but not least Sau Yee for their encouraging support and helpful advice in good times and not so good times.

Lastly, my happiness and lots of love go to my beloved family members, mum, dad and my sister for their encouragements, criticisms, guidance, and moral support and for being so understanding in everything. A tribute also goes to all the lecturers in Department of Biological Sciences in KUSTEM who are ever so willing to lend assistance.

All your good deeds and supports had been embalmed in memory. Thank you very much.

PUSAT PEMBELAJARAN DIGITAL SULTANAH NUR ZAHIRAH

## ABSTRACT

*Aeromonas hydrophila* (*A. hydrophila*) is a gram-negative bacterium that is ubiquitous, free living and opportunistic. *A. hydrophila* is found mostly in aqueous environment like lakes and streams, domestic tap water, and sewage. *A. hydrophila* has been named the most important cause of fish disease outbreaks in the field of fish aquaculture. The objectives of this project were to isolate *A. hydrophila* from healthy and apparently diseased *Tilapia mossambica* fishes, to identify the isolated *A. hydrophila* using biochemical tests, to determine the sensitivity of *A. hydrophila* to 11 different commonly used antimicrobial agents; and lastly to screen isolated *A. hydrophila* for the presence of plasmids. *A. hydrophila* was isolated from the eyes, gills, liver, kidney and intestines of the 61 healthy and apparently diseased common freshwater *Tilapia* fishes. All isolates were identified using standard biochemical tests and showed typical biochemical characteristics that have been ascribed to *A. hydrophila*. Out of 47 isolates, 44 were screened for the presence of plasmid DNA by agarose gel electrophoresis and all isolates were tested for susceptibility to 11 commonly used antimicrobial agents. Of the 47 fish isolates examined, nearly all were sensitive to cephalexin (82.98%) and resistant to penicillin (87.23%) and ampicillin (87.23%). Most isolates were sensitive to kanamycin (61.7%), gentamycin (55.32%) and chloromphenical (53.19%). Sixteen of 44 isolates harbored plasmids, with sizes ranging from 2.75 to 54 kilobase pair (kb). The presence of plasmid in *A. hydrophila* has been reported to be associated with its virulence towards its host and higher resistance towards antimicrobial agents.



## ABSTRAK

*Aeromonas hydrophila* (*A. hydrophila*) adalah bakteria gram-negatif yang dijumpai di hampir kesemua tempat yang berair seperti sungai dan tasik, air paip dan air longkang. *A. hydrophila* juga merupakan bakteria penyebab penyakit ikan di dalam industri akuakultur. Objektif-objektif projek ini adalah untuk mengasingkan *A. hydrophila* dari ikan *Tilapia mossambica* yang sihat dan yang kelihatan berpenyakit, mengenalpasti *A. hydrophila* yang telah diasingkan dengan menggunakan kaedah ujian biokimia, menentukan tahap sensitiviti *A. hydrophila* terhadap 11 agen antimikrob yang berlainan; dan akhir sekali untuk mengesan kehadiran plasmid dalam *A. hydrophila* yang telah diasingkan. *A. hydrophila* telah diasingkan dari mata, insang, hati, ginjal dan usus 61 ekor ikan Tilapia. Semua pemencilan telah dikenalpasti dengan menggunakan kaedah piawai ujian biokimia. Kesemua pemencilan telah menunjukkan ciri-ciri biokimia yang telah diberikan kepada *A. hydrophila*. 44 pemencilan *A. hydrophila* telah diperiksa untuk kehadiran DNA plasmid dengan menggunakan kaedah elektroforesis gel agaros dan semua pemencilan telah diuji dengan 11 agen antimikrob yang biasa, untuk melihat pengaruh terhadap pertumbuhan mereka. Dari 47 pemencilan ikan yang telah diperiksa, hampir kesemua adalah sensitif kepada cephalixin (82.98%) dan tahan kepada penicilin (87.23%) dan ampicilin (87.23%). Sebilangan besar pemencilan pula, sensitif kepada kanamicin (61.7%), gentamicin (55.32%) dan chloromphenical (53.19%). Manakala 16 dari 44 pemencilan mempunyai plasmid yang bersaiz 2.75 ke 54 pasangan kilobes (kb). Kehadiran plasmid dalam *A. hydrophila* telah sering dikaitkan dengan tahap ketahanan yang lebih tinggi terhadap agen antimikrob dan lebih virulen terhadap hosnya.