

MOLECULAR CHARACTERIZATION OF *Vibrio harveyi*  
ISOLATED FROM SHRIMP FARMS

WONG SIE HOONG

FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE  
UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

LP  
10  
FASM  
1  
2005

2005



MOLECULAR CHARACTERIZATION OF *Vibrio harveyi* ISOLATED FROM  
SHRIMP FARMS

Wong Sie Houg

This project report is submitted in partial fulfillment of the requirement of the degree  
of Bachelor of Applied Science  
(Fisheries Science)

FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE  
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

2005

1100042383

This project report should be cited as:

Wong, S.H. 2005. A study on molecular characterization of *Vibrio harveyi* isolated from shrimp farms. Undergraduate thesis, Bachelor of Applied Science (Fisheries Science), Faculty of Agrotechnology and Food Science, Kolej Universiti Sains dan Teknologi Malaysia, Terengganu. 55p.

No part of this project report 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.

## ACKNOWLEDGEMENTS

I was being extremely fortunate in being able to finish my final year project on time. I wish to express my thanks to Dr. Najiah Musa who has allowed me to have free access to Instrumentation Laboratory and Biotechnology Laboratory, FST and for her invaluable editorial, administrative help and financial support.

Furthermore, I would like to convey my gratitude to Mr. Lee Seong Wei for his invaluable advices, helping me to prepare medium and support during my laboratory works. He is the only one who accompanied me in the laboratory until midnight and sacrificed his precious time in order to help me to finish my works.

There are two more persons who give me spiritually and emotionally support throughout this project. There are no such words that can express my deepest thanks to them. Nevertheless I still need to say “thank you very much” to my beloved parents, Wong King Hung and Lai Ai Hua.

I would also like to apologize to anybody who felt inconvenient during my works in the laboratory, to whom which feel disturbed by my project and to anyone who felt that I really troubled him or her. Lastly, I would like to thank my housemates, coursemates and friends for their endless spiritual support.

## ABSTRACT

Disease due to luminous *Vibrio* has been a major problem of the shrimp industry. However, only *Vibrio harveyi* has been confirmed to cause mortality in shrimp. In this study, seven isolates of *Vibrio harveyi* sampled from two representative shrimp farms were characterized molecularly based on genomic DNA fingerprinting using Random Amplified Polymorphic DNA-PCR (RAPD-PCR) technique. Gram staining had been used to show *Vibrio harveyi* were gram negative bacteria. The RAPD amplification was performed in a DNA thermal cycler and the RAPD-PCR products were electrophoresised on 2% agarose gel. Agarose gel electrophoresis was used to separate DNA bands of each *Vibrio harveyi*. Isolates were obtained from shrimp farms in Tanjung Resang and Telaga Papan, Johore. DNA polymorphisms were seen in some isolates (Isolates no. 1, 2, 3, 4, 5, 7 and 14). From the bands analysis, a dendrogram was generated through the use of a RAPD software program NTSYS version 2.10j. The dendrogram revealed that there were two clusters and four subclusters. Isolates R4 (Tanjung Resang's isolate) and R6 (Telaga Papan's isolate) showed the highest percentage of similarity which was 100%. On the other hand, isolates R5 and R7 (Tanjung Resang's isolates) showed the lowest percentage of similarity which was 9.09%.

## ABSTRAK

Penyakit yang disebabkan oleh *Vibrio* telah menjadi satu masalah utama dalam industri udang. Walau bagaimanapun, *Vibrio harveyi* adalah salah satu bakteria membawa penyakit yang dikenalpasti menyebabkan kematian pada udang. Dalam kajian ini, *Vibrio harveyi* dari dua tempat yang berlainan telah dikaji dan dikenalpasti berdasarkan 'genomic DNA fingerprinting' melalui teknik 'Random Amplified Polymorphic DNA-PCR' (RAPD-PCR). 'Gram staining' telah digunakan bagi menunjukkan *Vibrio harveyi* adalah jenis bakteria gram negatif. 'RAPD amplification' dijalankan dalam 'DNA thermal cycler' dan hasil RAPD-PCR telah dielektroforesis pada 2% gel agarose. Proses elektroforesis dijalankan bagi memisahkan jejalur DNA yang diekstrak daripada *Vibrio harveyi*. Isolat-isolat berkenaan adalah diperolehi dari kolam udang di Tanjung Resang dan Telaga Papan, Johor. 'DNA polymorphisms' telah ditemui dalam beberapa isolat (no. isolat 1, 2, 3, 4, 5, 7 dan 14). Daripada analisis tersebut, 'dendrogram' dibina dengan menggunakan perisian NTSYS version 2.10j. 'Dendrogram' memaparkan dua kumpulan dan empat subkumpulan bagi isolat-isolat tersebut. Isolat R4 (isolat dari Tanjung Resang) dan R6 (isolat dari Telaga Papan) menunjukkan peratus keserupaan yang paling tinggi iaitu 100%. Isolat R5 dan R7 (kedua-dua isolat dari Tanjung Resang) pula menunjukkan peratus keserupaan yang paling rendah iaitu 9.09%.