IDENTIFICATION OF BACTERIA IN THE SURROUNDING WATER AND ON SUBMERGED POLYVINYL CHLORIDE PLATES AT KERTEH PORT, TERENGGANU.

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2013

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Identification of bacteria in the surrounding water and on submerged polyvinyl chloride plates at Kerteh Port, Terengganu
Ain Farhana Mohd Yatim.

Lihat Sebelah

Identification of Bacteria in the Surrounding Water and on Submerged Polyvinyl Chloride Plates at Kerteh Port, Terengganu.

By

Ain Farhana Binti Mohd Yatim

Research Report submitted in partial fulfillment
of the requirement for the degree of
Bachelor of Science (Marine Biology)

Department of Marine Science
Faculty of Maritime Studies and Marine Science
UNIVERSITI MALAYSIA TERENGGANU
2013

This project report should be cited as:

Yatim, A.F.M. 2013. Identification of bacteria in the surrounding water and on submerged polyvinyl chloride plates at Kerteh port, Terengganu. Undergraduate thesis, Bachelor of Science (Marine Biology), Faculty of Maritime Studies and Marine Science, University Malaysia Terengganu.

DEPARTMENT OF MARINE SCIENCE
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

IDENTIFICATION OF BACTERIA IN THE SURROUNDING WATER AND ON SUBMERGED POLYVINYL CHLORIDE PLATES AT KERTEH PORT, TERENGGANU

by AIN FARHANA MOHD YATIM, Matric No. UK 22579 have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree OF SCIENCE MARINE BIOLOGY, Faculty of Maritime Studies and Marine Science, University Malaysia Terengganu.

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DECLARATION

I hereby declare that this thesis entitle "**Identification of Bacteria in the Surrounding Water and on Submerged Polyvinyl Chloride Plates at Kerteh Port, Terengganu**" is my own researched except as cited in the bibliography.

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ACKNOWLEDGEMENTS

Assalamualaikum wbt.

In the name of Allah, The Most Merciful and The Most Gracious.

Thankful to Him for the strength He gave me in completing my final year projects as a requirement for the Degree of Bachelor of Science (Hons.) of Marine Biology. Upon this, I would also like to express my gratitude to many other parties. First and foremost I would like to express my sincerest gratitude to my supervisor, Dr Kesaven Bhubalan and Dr Hing Lee Siang, who have supported me throughout my thesis with patience and knowledge whilst finishing this report. Their guidance and recommendations helped me from time to time to improve and successfully conduct this study. Besides, I would like to express my earnest thank to my beloved parents, family and friends for their financial and moral support throughout this entire project. Without their encouragement and loving supports, this study would not be possible. Especially, Azmi Marzuki Muda and Putri Asma Megat Yusop who are being always supported and motivated myself to finish this study. Not forget to all staff at Makmal Biodiversiti and Makmal Instrumentasi that always being there to help. Moreover, a special gratitude is dedicated to the individuals who had given me the information and favors to successfully finish this project. Special thank to all readers who had reading this report. Hopefully, the information from this report will provide some understanding about laboratories cultivable bacteria in surrounding water and on submerged Polyvinyl Chloride plates especially in Malaysia.

Ain Farhana binti Mohd Yatim

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LIST OF ABBREVIATIONS

PVC	Polyvinyl chloride
EPS	Extracellular polymers
JCV	John Craig Venter
GOS	Global Ocean Sampling Expedition
DNA	Deoxyribonucleic acid
NCBI	National Center for Biotechnology Information's Trace Archive
CAMERA	Cyberinfrastructure for Advanced Marine Microbial Ecology Research and Analysis
TIGR	Institute for Genomic Research
TCAG	Center for the Advancement of Genomics
IBEA	Institute for Biological Energy Alternatives
JCVI	J. Craig Venter Science Foundation
MB	Marine Broth
MA	Marine Agar
TBE	Tris-Borate EDTA
EDTA	Ethylenediaminetetraacetic acid

PCR	Polymerase Chain reaction
EtBr	Ethidium bromide
CFU	Colony Forming Unit
CPS	Components of Polysaccharide
bp	base pair
dH_2O	Distilled water

LIST OF SYMBOLS

%	Percentage
mm	Millimeter
M	Meter
g	Gram
L	Liter
ml	Milliliter
°C	Celcius
rpm	rotation per minute
µl	Microliter
m^3	volume
$g\ L^{-1}$	gram per liter
ρmol	pico molar
mM	mili molar
psi	Pressure standard unit

Identification of bacteria in the surrounding water and on submerged polyvinyl chloride plates at Kerteh port, Terengganu.

ABSTRACT

This study describes the important of identifying the bacteria in the surrounding water and bacteria adhering on the submerged PVC plates at Kerteh port, Terengganu. The aim and objective of this study are to identify the bacteria in the surrounding water and on submerged PVC plates. Bacteria in the ocean play an important role in biofilms formation and biofouling activities. Based on the preliminary observation on the PVC plates left for one month in the surrounding water, the biofouling activities were occurred at Kerteh port area. The bacteria identified were only limited to laboratories cultivable bacteria. Then, 16S rRNA gene sequences, PCR purification and gel electrophoresis were done for a total of 15 bacterial isolates for both samples. Based on gel electrophoresis result, the amplification of 16S rRNA region was appeared at approximately 1500 base pair and an adequate amount for identification proposed. The sequencing result showed that, the bacteria identified were belongs to same family Vibrionaceae. The bacteria were known as *Photobacterium damsalae, Vibrio parahaemolyticus* and *Vibrio hepatarius.* The bacteria identified indicate that, they were present in the surrounding water and adhering on the submerged polyvinyl chloride plates.

Pengecaman bakteria di dalam air sekitar dan pada permukaan plat polyvinyl klorida di Perlabuhan Kerteh, Terengganu.

ABSTRAK

Kajian ini membincangkan kepentingan pengecaman bacteria di dalam air dan bakteria pada permukaan plat PVC di perlabuhan Kerteh, Terengganu. Tujuan dan objektif utama kajian ini adalah untuk mengenalpasti bakteria di dalam air sekitar dan mengenalpasti bakteria di permukaan PVC plat. Bakteria di laut memainkan peranan penting dalam proses biofilms dan aktiviti biofouling. Berdasarkan permerhatian awal pada PVC plat yang ditinggalkan di dalam air selama satu bulan, aktiviti biofouling berlaku di Perlabuhan Kerteh. Antara faktor kawasan seperti kadar nutrien yang mencukupi dan suhu optimum akan menyebabkan proses biofilms terbentuk. Bakteria akan diperkaya dengan menggunakan nutrien terpilih dengan menggunakan pencairan bersiri. Bakteria yang melalui proses pengecaman hanya bakteria yang boleh dikultur di dalam makmal sahaja. 16S rRNA gen dan elektrophoresis gel telah dijalankan untuk 15 jenis bacteria. berdasarkan keputusan 16S rRNA gen menunjukkan bakteria yang dikenal pasti adalah kepunyaan keluarga yang sama iaitu Vibrionaceae. Bakteria yang yang dikenal pasti adalah '*Photobacterium damsalae*', '*Vibrio parahaemolyticus*' dan '*Vibrio hepatarius*'. Bakteria yang dikenal pasti, menunjukkan mereka boleh berada di dalam air sekitar dan permukaan PVC plat.