

DETECTION OF ANTIBACTERIAL COMPOUNDS IN  
FUNGI ISOLATED FROM *SOMNERATIA*  
*CASEOLARIS*

SETI ROHAYU ZIHARI

FAKULTI SAINS DAN TEKNOLOGI  
UNIVERSITI MALAYSIA TERENGGANU

2008

1100057860

Perpustakaan Sultanah Nur Zahirah (UMT)  
Universiti Malaysia Terengganu

C/N 58551

LP 64 FST 1 2008



1100057860  
Detection of antibacterial compounds in fungi isolated from  
Sonneratia caseolaris. / Siti Rohayu Zahari.



PERPUSTAKAAN SULTANAH NUR ZAHIRAH  
UNIVERSITI MALAYSIA TERENGGANU (UMT)  
21030 KUALA TERENGGANU

1100057860		

Lihat sebelah

HAK MILIK  
PERPUSTAKAAN SULTANAH NUR ZAHIRAH UMT

**DETECTION OF ANTIBACTERIAL COMPOUNDS  
IN FUNGI ISOLATED FROM *SONNERATIA CASEOLARIS***

By  
Siti Rohayu Binti Zahari

A research report submitted in partial fulfillment of  
the requirements for the award of the degree of  
Bachelor of Science (Biological Sciences)

**DEPARTMENT OF BIOLOGICAL SCIENCES  
FACULTY OF SCIENCE AND TECHNOLOGY  
UNIVERSITI MALAYSIA TERENGGANU  
2008**

1100057869

This project should be cited as:

Siti Rohayu, Z. 2008. Detection of Antibacterial Compounds in Fungi Isolated from *Sonneratia caseolaris*. Undergraduate thesis, Bachelor of Science (Biological Sciences), Faculty of Science and Technology, University Malaysia Terengganu. 55pp.

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



**JABATAN SAINS BIOLOGI  
FAKULTI SAINS DAN TEKNOLOGI  
UNIVERSITI MALAYSIA TERENGGANU**

**PENGAKUAN DAN PENGESAHAN LAPORAN  
PROJEK PENYELIDIKAN I DAN II  
RESEARCH REPORT VERIFICATION**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: DETECTION OF ANTIBACTERIAL COMPOUNDS IN FUNGI ISOLATED FROM *SONNERATIA CASEOLARIS* oleh SITI ROHAYU BINTI ZAHARI, no. matrik: **UK12235** 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 (SAINS BIOLOGI)**, Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

Disahkan oleh/ Verified by:

Penyelia Utama/Main Supervisor

Nama: **DR. MARIAM TAIB**

Cop Rasmi:

**DR. MARIAM TAIB**  
Pensyarah  
Jabatan Sains Biologi  
Fakulti Sains dan Teknologi  
Universiti Malaysia Terengganu  
21030 Kuala Terengganu.

Tarikh: 13/5/08

Ketua Jabatan Sains Biologi/Head, Department of Biological Sciences

Nama: **PROF. MADYA DR. AZIZ BIN AHMAD**


Cop Rasmi:

**PROF. MADYA DR. AZIZ BIN AHMAD**  
Ketua  
Jabatan Sains Biologi  
Fakulti Sains dan Teknologi  
Universiti Malaysia Terengganu  
21030 Kuala Terengganu

Tarikh: 13 MAY 2008

## DECLARATION

I hereby declare that this thesis entitled **Detection of Antibacterial Compounds In Fungi Isolated From *Sonneratia caseolaris*** is the result of my own research except as cited in the references.

Signature :   
Name : Siti Rohayu Binti Zahari  
Matrix No : UK12235  
Date : 15 / 5 / 08

## ACKNOWLEDGEMENTS

Alhamdulillah and thanks to Allah S.W.T for His blessing and strength given to me in order to accomplish the final year project and thesis writing. A lot of valuable experiences have been gained throughout this project which I believe will come in handy for my future.

First and foremost, I would like to dedicate my highest gratitude to my supervisor Dr. Mariam Taib for the guidance and encouragement. The knowledge shared is priceless. I also would like to thank Dr. Aznawati as the coordinator and special thanks to Miss Afiza, master student who helped a lot. Thousands appreciation also goes to science officers and laboratory assistants for lending a hand.

In this opportunity, I also would like to thank my family and friends for the support and encouragement in completing this project. All of these wonderful people have made this project a success.

## ABSTRACT

Previous studies proved that marine-derived fungi contain antimicrobial properties. Lots of researches considered mangrove as the best studied habitat of marine-related fungi. This study was carried out to detect any antibacterial compound from marine fungi isolated from *Sonneratia caseolaris* or 'berembang' in Malay. Three marine fungal species have been confirmed based on spores and hyphae structure: *Haloguignardia oceanica*, *Carbosphaerella leptoshaerioides* and *Chadefaudia polyporolithi*. Fungal extracts were prepared from the mycelial filtrate, evaporated and reconstituted in 50% ethanol. The extracts obtained were used in antibacterial assay where different volumes of all fungal extracts, (20 $\mu$ l, 40 $\mu$ l and 60 $\mu$ l) were tested against five bacterial test strains: *E. coli*, *Salmonella* sp., *Klebsiella* sp., *Pseudomonas* sp. and *Streptococcus agalactiae*. The results show possible inhibition zones at higher volume of fungal extracts. However, the zone is not clear enough and the diameter is smaller to be indicated as susceptible. In the bioactive compound identification, the separation of active constituents of the extracts was done using Thin Layer Chromatography (TLC) and many different solvent systems at different ratios were tested. However, none of the solvents fully separated the compound in fungal extracts. Further study is therefore needed to identify possible bioactive compounds.



## PENGESANAN SEBATIAN ANTIBAKTERIA DALAM FUNGI YANG DIPENCIL DARIPADA *SONNERATIA CASEOLARIS*

### ABSTRAK

Berdasarkan kajian yang telah dibuat terdahulu, fungi marin telah terbukti mempunyai sifat antimikrobial. Banyak kajian mengandaikan paya bakau pula merupakan kawasan terbaik untuk membuat kajian spesis fungi marin. Kajian ini dijalankan untuk mengesan bahan antibakteria yang terdapat dalam fungi marin. Tiga spesis fungi marin yang dipencil dari pokok bakau *Sonneratia caseolaris* telah dikenal pasti iaitu; *Haloguignardia oceanica*, *Carbosphaerella leptoshaerioides* dan *Chadefaudia polyporolithi*. Ekstrak fungi laut ini disediakan daripada filtrat mycelia yang diwapkan dan dicampur dengan 50% ethanol. Kemudian, ekstrak fungi yang diperolehi digunakan untuk menguji keupayaannya sebagai antibakteria di mana isipadu ekstrak yang berlainan (20 $\mu$ l, 40 $\mu$ l, 60 $\mu$ l) diuji ke atas lima jenis bakteria. Keputusan yang diperolehi menunjukkan kemungkinan terdapat zon perencatan pertumbuhan bakteria yang oleh isipadu ekstrak yang tinggi. Walau bagaimanapun zon yang diperolehi tidak cukup jelas dan mempunyai diameter yang lebih kecil untuk diandaikan sebagai mempunyai keupayaan antibakteria. Manakala untuk identifikasi bahan bioaktif, pemisahan bahan aktif di dalam ekstrak fungi dilakukan dengan kaedah Thin Layer Chromatography (TLC) dan beberapa sistem solven nisbah yang berbeza telah dicuba. Walau bagaimanapun, tiada satu pun solven yang dapat memisahkan sepenuhnya bahan aktif di dalam ekstrak kulat tersebut. Kajian seterusnya harus dilakukan untuk mengenalpasti solven yang sesuai pada kadar nisbah yang sesuai untuk pengasingan bahan aktif di dalam ekstrak fungi.