

IDENTIFICATION OF MARINE FUNGUS FROM
TANGKAPAN ORGANISMA EAST COAST OF
PENINSULAR MALAYSIA

ABSTRACT

FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

2006

ISOLATION OF MANGLICOLOUS MARINE FUNGUS FROM MANGROVE
COMMUNITY IN EAST COAST OF PENINSULAR MALAYSIA

By

Hazarinna Binti Ali

Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Applied Science (Biodiversity Conservation and Management)

Department of Biological Sciences
Faculty of Science and Technology
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2006

This project should be cited as:

Hazarinna, A. 2006. Isolation of Manglicolous Marine Fungus from Mangrove Community in East Coast of Peninsular Malaysia. Undergraduate thesis. Bachelor of Applied Science (Biodiversity Conservation and Management), Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia, Terengganu. 57p.

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 a retrieval system, transmitted, or otherwise copied for public or private use, without written permission from the author and the supervisors of the project.



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

**PENGAUKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: ISOLATION OF MANGLICOLOROUS MARINE FUNGUS FROM MANGROVE COMMUNITY IN EAST COAST OF PENINSULAR MALAYSIA oleh HAZARINNA BINTI ALI, No. Matrik UK 7783 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Gunaan (Pemuliharaan dan Pengurusan Biodiversiti), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:

Penyelia Utama
Nama: **JAMALAH MOHD SALIM @ HALIM**
Cop Rasmi: Pensyarah
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu, Terengganu.

Tarikh: 10/05/06

Ketua Jabatan Sains Biologi
Nama: **PROF. MADYA DR. NAKISAH BT. MAT AMIN**
Cop Rasmi: Ketua
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu.

Tarikh:

ACKNOWLEDGEMENTS

My work on this research was shaped by the inputs from my supervisor, Miss Jamilah Bt. Salim@Halim who shared her knowledge and guidance throughout the project. A thank also go to Associate Professor Dr. Siti Aishah Bt. Hj. Alias for providing literature for this project. The unsolicited comments from Microbiology Laboratory Assistants were also very helpful. For providing supplementary materials and guidance in the field, thanks go to Miss Norazlina Bt. Abd. Aziz, the Biological Department Science Officer and Tn. Hj. Razali B. Salam, the Basic Biology Laboratory Assistance. My heartfelt thanks also go to whoever contributed to this project and research report, which I may not be able to mention here. Finally, I am deeply grateful to my family and friends for their support, encouragement and patience.

Hazarinna Ali

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF ABBREVIATIONS	vii
LIST OF APPENDICES	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	1
1.1 Introduction	1
1.2 Objectives of the Study	3
CHAPTER 2 LITERATURE REVIEW	4
2.1 The Marine Fungi	4
2.2 Role of Marine Fungi in Mangrove Ecosystem	5
2.3 The Taxonomy of Manglicolous Marine Fungi	5
2.4 Diversity of Manglicolous Marine Fungi in Relation to Substrates and Tidal Level	7
CHAPTER 3 METHODOLOGY	8
3.1 Description of study sites	8
3.1.1 Tok Bali, Kelantan and Setiu Wetland, Terengganu	8
3.1.2 Kemaman, Terengganu and Kuantan, Pahang	9

3.2	Collection of Samples	10
3.3	Isolation Methods	11
3.3.1	Direct Culture Techniques	11
3.3.2	Damp Incubation Technique	12
3.4	Presentation of Data and Fungal Identification	12
CHAPTER 4 RESULTS		14
4.1	Fungi Isolated by Direct Culture Technique	14
4.1.1	Fungal colonization on leaf substrate	15
4.1.2	Fungal colonization on woody substrate	18
4.1.3	Fungal colonization on root substrate	20
4.2	Fungi Isolated by Damp Incubation Technique	22
4.2.1	Fungal isolation from leaf substrate	22
4.2.2	Fungal isolation from woody substrate	23
4.2.3	Fungal isolated from root substrate	27
4.3	Total Fungal Taxa Recorded From Both Techniques	29
CHAPTER 5 DISCUSSION		31
CHAPTER 6 CONCLUSION		36
6.1	Recommendation	36
REFERENCES		37
APPENDICES		40
CURICULUM VITAE		57

LIST OF TABLES

Table		Page
4.1	Frequency of occurrence (%) of filamentous fungi on mangrove decayed leaf substrate sampled from East Coast of Peninsular Malaysia using direct culture technique	17
4.2	Frequency of occurrence (%) of filamentous fungi on mangrove woody substrate sampled from East Coast of Peninsular Malaysia using direct culture technique	19
4.3	Frequency of occurrence (%) of filamentous fungi on mangrove roots substrate sampled from East Coast of Peninsular Malaysia using direct culture technique	21
4.4	Frequency of occurrence (%) of filamentous fungi on mangroves decayed leaf substrate collected from East Coast of Peninsular Malaysia examined using damp incubation technique	24
4.5	Frequency of occurrence (%) of filamentous fungi on mangrove woody substrates collected from East Coast of Peninsular Malaysia examined using damp incubation technique	25
4.6	Frequency of occurrence of manglicolous fungi present on mangrove root substrate collected from East Coast of Peninsular Malaysia examined using damp incubation technique	28

LIST OF FIGURES

Figure		Page
3.1	Map of the east coast of Peninsular Malaysia indicating the sampling locations	9
4.1	Most common manglicolous fungi obtained from direct culture technique	15
4.2	Unidentified Deuteromycete 1 occurred at Tok Bali	18
4.3	Unidentified Zygomycete 2	20
4.4	Very frequently occurred Manglicolous fungi of east coast of Peninsular Malaysia	23
4.5	Very frequent fungi on woody substrate recorded from the East Coast of Peninsular Malaysia	27
4.6	Comparison of major group of fungi recorded from mangroves of the East Coast of Peninsular Malaysia	29
4.7	Comparison of the number of fungal taxa colonizing mangrove substrates of East Coast of Peninsular Malaysia	30

LIST OF ABBREVIATIONS

ANOVA	-	Analysis of Variance
cm	-	centimeter
E	-	East
F/O	-	Frequency of Occurrence
mm	-	millimeter
N	-	North
PDA	-	Potato Dextrose Agar
S.I.	-	Similarity Index
SWA	-	Sea Water Agar
Tg.	-	Tanjung
°	-	degree
°C	-	degree Celcius
'	-	minute
>	-	more
<	-	less
%	-	percent

LIST OF APPENDICES

1	Summary of methodology applied in this study	40
2	Medium preparation	41
3	List of manglicolous fungi recorded from mangrove community in East Coast of Peninsular Malaysia using direct culture technique	42
4	Anova: Single Factor Leaf Culture	47
	Anova: Single Factor Woody Culture	47
	Anova: Single Factor Root Culture	47
5	List of manglicolous fungi recorded in the East Coast of Peninsular Malaysia using damp incubation technique	48
6	Anova: Single Factor Damp incubation of leaf substrate	51
	Anova: Single Factor Damp incubation of woody substrate	51
	Anova: Single Factor Damp incubation on root substrate	51

ABSTRACT

Various substrates from selected mangrove stands of Kelantan, Terengganu and Pahang were screened for the presence of manglicolous fungus. A total of 65 fungal taxa were recorded from this study, comprising 20 ascomycetes, four basidiomycetes, 12 deuteromycetes, two zygomycetes and 27 unidentified species from various substrates in all study sites. Ascomycetes were the most frequently present group of fungus in all study sites. The highest number of isolates and diversity were shown by fungus that colonizing wood samples compare to leaf and root substrates. The diversity and occurrence of manglicolous fungi at all study sites were compared and discussed. Substrate preference, fungal colonization and techniques to study mangrove filamentous fungi also were highlighted.

PEMENCILAN KULAT MANGLICOLOUS DARIPADA KOMUNITI HUTAN PAYA LAUT PANTAI TIMUR SEMENANJUNG MALAYSIA

ABSTRAK

Pelbagai substrata dari dirian hutan paya laut terpilih Kelantan, Terengganu dan Pahang telah ditinjau bagi mengesan kehadiran kulat manglicolous. Sejumlah 65 taksa kulat telah direkodkan dalam kajian ini, terdiri daripada 20 ascomycetes, empat basidiomycetes, 12 deuteromycetes, dua zygomycetes dan 27 spesies yang tidak dapat dikenalpasti dari pelbagai jenis substrata dari kesemua lokasi kajian. Ascomycetes merupakan kumpulan kulat yang paling kerap hadir di kesemua lokasi kajian. Pemencilan dan kepelbagaian yang paling tinggi ditunjukkan oleh kulat yang mengkoloni sampel kayu berbanding daun dan akar. Kepelbagaian dan kemunculan kulat manglicolous di kesemua lokasi kajian dibandingkan dan dibincangkan. Kecenderungan substrata, pengkolonian fungi dan teknik-teknik mengkaji kulat hutan paya laut juga diberikan penekanan.