

MOJUK ASSOCIATED FUNGUS ISOLATED FROM
TEMBUSU (*Trichosanthes frutescens*)

HIRVATI BINTI ABDUL RAHMAN

FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU
2007

WOUND ASSOCIATED FUNGUS ISOLATED FROM TEMBUSU
(*Fragraea fragrans*)

By

Haryati Binti Abdul Rahim

Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Biological Science)

Department of Biological Sciences
Faculty of Science and Technology
UNIVERSITI MALAYSIA TERENGGANU
2007

1100051133

This project should be cited as:

Haryati, A. R. 2007. Wound associated fungus isolated from Tembusu (*Fragraea fragrans*). Undergraduate thesis, Bachelor of Science (Biological Science), Faculty of Science and Technology, Universiti Malaysia Terengganu, Terengganu. 30p.

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 supervisor 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: WOUND ASSOCIATED FUNGUS ISOLATED FROM TEMBUSU (*Fragraea fragrans*) oleh HARYATI BINTI ABDUL RAHIM, no. matrik: UK 10471 telah diperiksa dan semua pembedaan 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: **JAMILAH MOHD SALIM @ HALIM**
Pensyarah
Cop Rasmi: Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu.

Tarikh: 30/4/07

Ketua Jabatan Sains Biologi/Head, Department of Biological Sciences

Nama: **DR. AZIZ BIN AHMAD**
Ketua
Cop Rasmi: Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Tarikh: 30/4/07

TABLES OF CONTENTS

| | Page |
|--|-------------|
| ACKNOWLEDGEMENT | ii |
| LIST OF TABLES | iii |
| LIST OF FIGURES | iv |
| LIST OF ABBREVIATION | v |
| LIST OF APPENDICES | vi |
| ABSTRACT | vii |
| ABSTRAK | viii |
| CHAPTER 1 INTRODUCTION | 1 |
| 1.1 Introduction | 1 |
| 1.2 Objectives | 2 |
| CHAPTER 2 LITERATURE REVIEW | 3 |
| 2.1 Heath vegetation | 3 |
| 2.2 <i>Fragraea fragrans</i> (tembusu) | 3 |
| 2.3 Fungi | 4 |
| 2.3.1 Phylum Basidiomycota | 4 |
| 2.3.2 Phylum Zygomycota | 5 |
| 2.3.3 Phylum Ascomycota | 6 |
| 2.4 Wood chemistry and structure | 7 |
| 2.5 Fungus-wood interactions | 8 |
| CHAPTER 3 METHODOLOGY | 9 |
| 3.1 Study area | 9 |
| 3.2 Artificial Wound Creation | 11 |
| 3.3 Fungus isolation | 12 |
| 3.4 Frequency of Isolated Fungus | 13 |

| | | |
|-----|--|----|
| 3.5 | Fungal identifications | 13 |
| | CHAPTER 4 RESULTS | 14 |
| | CHAPTER 5 DISCUSSION | 19 |
| | CHAPTER 6 CONCLUSION AND RECOMMENDATION | 22 |
| | REFERENCES | 23 |
| | APPENDICES | 29 |
| | CURICULUM VITAE | 30 |

ACKNOWLEDGEMENT

First and foremost, I would like to express my deepest appreciation and sincere gratitude to my supervisor, Miss Jamilah Bt Salim@Halim for all her endurance in assisting me throughout the completion of this project.

My work on this project was also shaped by the inputs from all the Microbiology Laboratory Assistants who shared their knowledge and guidance throughout the project. Unsolicited comments from them also very helpful. A portion of this project was made possible by supports and cooperation from my friends especially Asuar Ayuni Anuar, Zatul Himmah Samsudin and Nurshela Mohd Nai.

Lastly, I wish to express my heartfelt gratitude to my loving parents for being a constant source of encouragement, and also to other individuals that involved either directly or indirectly. So, I also extend a debt of gratitude to all of them.

LIST OF TABLES

| Table | | Page |
|--------------|---|-------------|
| 4.1 | Frequency of fungi isolated from exposed of inner bark and exposed of sapwood of <i>Fragraea fragrans</i> | 15 |
| 4.2 | Genera of fungi isolated, microscopic observation and culture characteristics found in both wound depth of <i>Fragraea fragrans</i> | 17 |

LIST OF FIGURES

| Figure | | Page |
|--------|---|------|
| 2.1 | Life cycle of phylum Basidiomycota | 5 |
| 2.2 | Life cycle of phylum Zygomycota | 6 |
| 2.3 | Life cycle of phylum Ascomycota | 7 |
| 3.1 | Study site of field sampling at heath vegetation of Rantau Abang | 10 |
| 3.2 | Heath vegetation dominated by <i>Fragraea fragrans</i> (tembusu), <i>Melaleuca leucodendron</i> (gelam) and <i>Acacia mangium</i> | 11 |
| 3.3 | Heath vegetation dominated by <i>Fragraea fragrans</i> (tembusu), <i>Melaleuca leucodendron</i> (gelam) and <i>Acacia mangium</i> | 11 |
| 3.4 | <i>Fragraea fragrans</i> that artificially wounded by exposed of inner bark | 12 |
| 3.6 | <i>Fragraea fragrans</i> that artificially wounded by exposed of sapwood | 13 |

LIST OF ABBREVIATION

| | | |
|-------|---|---------------------------------------|
| BRIS | - | beach ridges interspersed with swales |
| cm | - | centimeter |
| CODIT | - | compartmentalization of decay in tree |
| DBH | - | diameter breast height |
| m | - | meter |
| ml | - | milliliter |
| PDA | - | Potato Dextrose Agar |

LIST OF APPENDICES

| Appendix | | Page |
|-----------------|----------------------------------|-------------|
| 1 | Potato Dextrose Agar preparation | 30 |

ABSTRACT

Fungal colonization in living tree usually associated with wounds. Rapid growth of mycelium in the open wound may cause the process of decay occurred. The isolation and characterization of fungus associated with artificial stem wound of *Fragraea fragrans* were conducted in heath vegetation of Rantau Abang, Terengganu from October 2006 to February 2007. A total of 17 individuals fungus from six genera were recorded and isolated. Six species of fungi were isolated from wound that exposed stem inner bark and five species of fungi were isolated from wound of exposed sapwood. The most frequently isolated genus was *Trichophyton* with seven individuals fungus, (42% of total isolated fungus). Although there were several common fungi isolated from both wound depth, there was indication that succession pattern of fungus was different. Possible factors that determined fungus population on wound over time are discussed.

**PEMENCILAN KULAT DARIPADA LUKA BUATAN PADA POKOK
TEMBUSU (*Fragraea fragrans*)**

ABSTRAK

Pengkolonian kulat pada pokok hidup lazimnya dikaitkan dengan luka. Pertumbuhan miselium yang cepat di atas luka yang terdedah boleh menyebabkan proses pereputan kayu berlaku. Pemencilan dan pencirian kulat yang berasosiasi dengan luka buatan pada batang pokok *Fragraea fragrans* telah dijalankan di kawasan vegetasi padang di Rantau Abang, Terengganu dari Oktober 2006 sehingga Februari 2007. Secara keseluruhannya, sejumlah 17 individu kulat yang terdiri daripada enam genus kulat telah direkod dan dipencilkan. Enam spesis kulat telah berjaya dipencilkan daripada luka yang mendedahkan bahagian dalaman kulit pokok dan lima spesis kulat telah dipencilkan daripada luka yang mendedahkan bahagian berkayu pokok. Genus kulat yang paling kerap dipencilkan ialah *Trichophyton* dengan tujuh individu kulat, (42% daripada jumlah kulat yang dipencilkan). Walaupun terdapat beberapa spesis kulat yang serupa dipencilkan daripada kedua-dua kedalaman luka, kemungkinan terdapat corak sesaran kulat yang berbeza mengikut kedalaman. Faktor-faktor yang mungkin mempengaruhi populasi kulat berdasarkan masa turut dibincangkan.