

**UNIVERSITI TEKNOLOGI MARA**

**DIVERSITY OF ENDOPHYTIC BACTERIA  
IN RUBBER ROOTS AND ITS POTENTIAL  
AGAINST WHITE ROOT DISEASE  
(*Rigidoporus lignosus*)**

**MOHD FIQRI BIN BAHARI**

Final year project report submitted in partial fulfilment of the  
requirements for the degree of

**Bachelor of Science (Hons.) Plantation Technology and  
Management**

**Faculty of Plantation and Agrotechnology**

**December 2014**

## APPROVAL SHEET

This Final Year Project Report entitled “**Diversity of Endophytic Bacteria in Rubber Roots and Its Potential against White Root Disease (*Rigidoporus Lignosus*).**” was submitted by **Mohd Fiqri Bin Bahari**, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Plantation Technology and Management, in the Faculty of Plantation and Agrotechnology, and was approved by

---

**DR. ZAITON SAPAK**

**Supervisor**

Faculty of Plantation and Agrotechnology  
Universiti Teknologi MARA,  
Jasin Melaka

---

**MISS WAN NATASYA BINTI WAN AHMED**

**Project Coordinator**

Bsc. (Hons.) Plantation  
Technology and Management  
Faculty of Plantation and  
Agrotechnology  
Universiti Teknologi MARA  
Jasin, Melaka

---

**MISS NORDIANA BINTI IBRAHIM**

**Head of Study Center**


Bsc. (Hons.) Plantation  
Technology and Management  
Faculty of Plantation and  
Agrotechnology  
Universiti Teknologi MARA  
Jasin, Melaka

## DECLARATION

This Final Year Project is a partial fulfilment of the requirements for a degree of Bachelor of Science (Hons.) Plantation Technology and Management, Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA.

It is entirely my own work and has not been submitted to any other University or higher education institution, or for any other academic award in this University. Where use has been made of the work of other people it has been fully acknowledged and fully referenced.

I hereby assign all and every rights in the copyright to this Work to the Universiti Teknologi MARA ("UiTM"), which henceforth shall be the owner of copyright in this Work and that, any reproduction or use in any form or by any means whatsoever is prohibited without a written consent of UiTM.

Candidate's signature : 

Date: 28/1/15

Name: MOHD. FIQRI R. BAHARI

I hereby declare that I have checked this project and in my opinion, this project is adequate in terms of scope and quality for the award of the degree of Bachelor of Science (Hons.) Plantation Technology and Management, Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA.

Signature: 

Name of Supervisor: DR. ZAITON SAPAK

Pensyarah  
Fakulti Perladangan dan Agroteknologi  
Universiti Teknologi MARA  
40460 Shah Alam

Position:

Date: 28/1/15

## ABSTRACT

Endophytic bacteria have been isolated from roots of *Hevea briensiliensis* with three difference types which are mature and immature commercial types and immature of wild types. All the samples were taken from Tanah Wakaf area Nyalas, Melaka and the clone taken for the commercial types was RRIM 2025. Fourteen endophytic bacteria were successfully isolated from the roots samples. These isolated endophytic bacteria were tested for its antagonism activity against *Rigidoporus lignosus* pathogen a causal of white roots disease of rubber by using a dual culture test. These isolated were also tested for preproduction of secondary metabolites that have potential to inhibit the growth of the pathogen through a culture filtrate test. Two isolated named as EB1 and EB4 showed the highest percentage of inhibition radial growth (PIRG) of *R. lignosus* with the values of 72.94% and 68% respectively on dual culture test. Meanwhile the isolated of EB1 and EB4 bacteria produce secondary metabolites that could inhibit the pathogen growth with 57.69% of PIRG and 69.41% respectively.

## TABLE OF CONTENTS

<b>ABSTRACT</b>	<b>iv</b>
<b>ABSTRAK</b>	<b>v</b>
<b>ACKNOWLEDGEMENT</b>	<b>vi</b>
<b>TABLE OF CONTENTS</b>	<b>vii</b>
<b>LIST OF TABLES</b>	<b>ix</b>
<b>LIST OF FIGURES</b>	<b>x</b>
<b>1.0 Chapter One INTRODUCTION</b>	
1.1 Background of study	1
1.2 Problem Statement	3
1.3 Research Question	4
1.4 Objectives of Study	5
1.5 Hypothesis	5
1.6 Significance of Study	6
1.7 Scope of study	6
1.8 Limitation	6
<b>2.0 Chapter Two LITERATURE RIVIEW</b>	
2.1 Rubber tree ( <i>Hevea brainsilensis</i> )	7
2.2 Economic important of rubber	8
2.3 The Challenge of rubber ( <i>Hevea brasiliensis</i> ) in Malaysia	10
2.4 Disease of rubber tree	11
2.5 White root disease ( <i>Rigidoporus lignosus</i> )	13
2.6 Endophytes microorganism	15
2.7 Endophytic microorganism as biological control agent	16
<b>3.0 Chapter Three METHODOLOGY</b>	
3.1 Location of Study	18
3.2 Materials	18
3.3 Parameter	20
3.4 Procedure of study	21