

This Final Year Project Report entitled "Antibacterial Activity of *Acacia mangium* (Willd.) Extract Against *Xanthomonas oryzae* pv. *oryzae*" was

**ANTIBACTERIAL ACTIVITY OF *Acacia mangium* (Willd.)
EXTRACT AGAINST *Xanthomonas oryzae* pv. *oryzae***



En. Abdul Masop Mahmud,
Main Supervisor
B. Sc. (Hons.) Biology
Faculty of Applied Sciences
Universiti Teknologi MARA
88997 Kota Kinabalu, Sabah

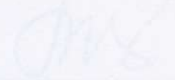


Dr. Henry Joseph,
Co-Supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA
88997 Kota Kinabalu, Sabah

HASNIDAR BINTI ISKANDAR



En. Ajuni Jawari
Project Coordinator
B. Sc. (Hons.) Biology
Faculty of Applied Sciences
Universiti Teknologi MARA
88997 Kota Kinabalu, Sabah



En. Abdul Masop Mahmud,
Head of Programme
B. Sc. (Hons.) Biology
Faculty of Applied Sciences
Universiti Teknologi MARA
88997 Kota Kinabalu, Sabah

**Final Year Project Report Submitted in
Partial Fulfillment of the Requirement for the
Degree of Bachelor of Science (Hons.) Biology
in the Faculty of Applied Sciences
Univerisiti Teknologi MARA**

DECEMBER 2014

Doc: 21 007407 2015

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
1.0 CHAPTER 1 : INTRODUCTION	
1.1 Background of study	1
1.2 Problem statement	2
1.3 Significance of study	3
1.4 Objectives of the study	3
2.0 CHAPTER 2 : LITERATURE REVIEW	
2.1 Phytochemical screening	4
2.2 Antimicrobial activity	5
2.3 Bacterial Blight Disease (BLB)	6
2.4 Test organism	
2.4.1 <i>Xanthomonas oryzae</i> pv. <i>oryzae</i>	7
2.5 Plants	
2.5.1 <i>Oryzae Sativa. L.</i> (Rice)	8
2.5.2 <i>Acacia mangium</i>	9
3.0 CHAPTER 3 : METHODOLOGY	
3.1 Materials	
3.1.1 Raw materials	10
3.1.2 Chemicals	10
3.1.3 Apparatus	11
3.2 Method	
3.2.1 Sample collection	13
3.2.2 Plant extraction	15
3.2.3 Disc Diffusion Technique	
3.2.5.1 Media preparation	16
3.2.5.2 Preparation of filter paper disc	16
3.2.5.3 Disc diffusion test	16
3.3 Data analysis	17

LIST OF TABLES

4.0 RESULTS AND DISCUSSIONS	
4.1 Phytochemical screening	18
4.2 Antibacterial assays	
4.2.1 Disc Diffusion Susceptibility Test	22
5.0 CONCLUSIONS AND RECOMMENDATION	
5.1 Conclusion	30
5.2 Recommendations	31
CITED REFERENCES	32
APPENDICES.	37
CURRIVULUM VITAE	42

ABSTRACT

Bacterial Blight Disease (BLB) caused by *Xanthomonas oryzae* pv. *oryzae* is one of the destructive bacteria on rice. The impact of bacterial infection is heavy economic loss to the planters. Recently, the application of synthetic chemical substance in order to suppressed the bacterial growth was reported to give negative impact on consumers. Therefore, in this study an alternative approach by using methanolic plant extracts of *Acacia mangium* which is its bark, leaf and flower were tested. The methanolic plant extract were obtained by using dried parts of the plants and extracted in trough a maceration method. The plant component werè screened and the antibacteria activity were tested. The phytochemical screening tested indicated that each part of the plants containing alkaloids, phenol, saponin, flavonoids, terpenoids, tannins, quinoine, glycoside, steroids and proteins which have potential as an antifungal, antioxidants and as plant pests control. The antibacterial activity was tested by using the disc diffusion technique against the *Xanthomonas oryzae* pv. *oryzae* with the concentration of 0.1, 0.2, and 0.3 g/mL on each of the plant extracts. However, no inhibition zone was observed. It indicated that, there is no antibacterial activity against *Xanthomonas oryzae* pv. *Oryzae*. Therefore, it is recommended that to make further study about the potential of this plant against the bacteria.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Agricultural or crop planting are being practiced in Malaysia. Chamhuri *et al.*, (2014) reported that, rice is an important food crop among Malaysian when it had reached 3.7% of growth rate for last five years. Rice although not categorized as major crop, it has been the staple food among half of the human population in the world (Chamhuri *et al.*, 2014). This is because, rice is a good source of Vitamin B, minerals, proteins, amino acids and carbohydrates that is needed in daily consumption (Ventakesh *et al.*, 2011). As a results, there are many types of paddy that being planted continuously in Malaysia, and one of them is *Oryza sativa L.* However, the bacterial infection known as Bacterial Leaf Blight (BLB) is the most dangerous rice disease (Guang *et al.*, 2008). The bacterium was first being found by a farmers in Kyushu Island in Japan between 1884 to 1885 (Tagami *et al.*, 1962). The disease of BLB were carried by a bacterium known as *Xanthomonas oryzae* (Khan *et al.*, 2014). Recently,