

**ISOLATION AND CHARACTERIZATION OF PLANT GROWTH
PROMOTING BACTERIA (PGPB) AT UITM KUALA PILAH
FOREST RESERVED**

NORMAZNI BINTI ABDUL WAHAB

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

JANUARY 2017

The Final Year Project entitled **“Isolation and Characterization of Plant Growth Promoting Bacteria (PGPB) at UiTM Kuala Pilah Forest Reserved”** was submitted by Normazni Binti Abdul Wahab, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Biology, in the Faculty of Applied Sciences, and was approved by

Ilyanie Hj. Yaacob
Supervisor
Faculty of Applied Sciences
UiTM Negeri Sembilan
Kampus Kuala Pilah
Pekan Parit Tinggi
72000, Kuala Pilah
Negeri Sembilan

Ilyanie Bt. Hj. Yaacob
Project Coordinator
Faculty of Applied Sciences
UiTM Negeri Sembilan
Kampus Kuala Pilah
Pekan Parit Tinggi
72000, Kuala Pilah
Negeri Sembilan

Dr. Nor'aishah Abu Shah
Head of School of Biology
Faculty of Applied Sciences
UiTM Negeri Sembilan
Kampus Kuala Pilah
Pekan Parit Tinggi
72000, Kuala Pilah
Negeri Sembilan

Date: _____

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1: INTRODUCTION	
1.1 Background Study	1
1.2 Problem Statement	2
1.3 Significant of the Study	3
1.4 Objective of the Study	3
CHAPTER 2: LITERATURE REVIEW	
2.1 Plant Requirement	4
2.2 <i>Dicranopteris</i>	6
2.3 Microorganisms in Soil	7
2.4 Plant Growth Promoting Bacteria (PGPB)	9
2.5 Beneficial roles of PGPB	9
2.6 Characterization of PGPB	11
2.7 Example of PGPB Species	11
CHAPTER 3: METHODOLOGY	
3.1 Materials	13
3.1.1 Raw materials	13
3.1.2 Chemicals	13
3.1.3 Apparatus	14
3.2 Methods	14
3.2.1 Media preparation	14
3.2.1.1 Preparation of Nutrient Agar	14
3.2.1.2 Preparation of Nutrient Agar supplemented with 3%, 6%, and 9% sodium chloride (NaCl) concentration	15

3.2.1.3	Preparation of Trypticase Soy Agar (TSA) supplemented with 4.4 g/l glycine	15
3.2.1.4	Preparation of Nutrient Broth	16
3.2.1.5	Preparation of bacteriology peptone water	16
3.2.1.6	Preparation of 0.5% picric acid and 2% sodium carbonate, Na ₂ CO ₃	16
3.2.2	Samples collection	17
3.2.3	Isolation	17
3.2.4	Characterization	18
3.2.4.1	Microscopic identification	18
3.2.4.2	Screening for plant growth promoting traits	19
3.2.4.2.1	Hydrogen cyanide (HCN) production	19
3.2.4.2.2	Production of ammonia	19
3.2.4.2.3	Catalase test	20
3.2.4.2.4	Salt tolerance	21
CHAPTER 4: RESULTS AND DISCUSSION		
4.1	Morphology Characteristics	22
4.2	Plant Growth Promoting Traits	32
4.2.1	Hydrogen cyanide (HCN) production	32
4.2.2	Ammonia production	33
4.2.3	Catalase test	33
4.2.4	Salt tolerance	34
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS		37
CITED REFERENCES		38
APPENDICES		44
CURRICULUM VITAE		49

ABSTARCT

ISOLATION AND CHARACTERIZATION OF PLANT GROWTH PROMOTING BACTERIA (PGPB) AT UITM KUALA PILAH FOREST RESERVED

The study was conducted at UiTM Kuala Pilah Forest Reserved at Negeri Sembilan, Malaysia. This study was started from September 2016 until December 2016. The objective for this study is to isolate and characterized plant growth promoting bacteria (PGPB) from root at UiTM Kuala Pilah reserved forest. The roots sample was taken and later being undergo serial dilution and plated on Nutrient Agar. The colonies with different morphology was proceed with gram staining, motility, hydrogen cyanide (HCN) production, ammonia production, catalase test, and salt tolerance test. 6 isolates was obtained from this experiment and most of them possessed more than one PGPB characteristics for each isolated. The potential PGPB was A1. Thus, UiTM Kuala Pilah forest reserved have potential PGPB.