

**PHYTOCHEMICAL ANALYSIS AND BIOLOGICAL
ACTIVITY OF *Melastoma malabathricum* AND
*Dissochaeta gracilis***

WAN NUR AQILAH BINTI WAN MOHD SAMSUDIN

**BACHELOR OF SCIENCE (Hons.) CHEMISTRY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA**

JANUARY 2019

This Final Year Project Reported entitled “**Phytochemical Analysis And Biological Activity Of *Melastoma malabathricum* And *Dissochaeta gracilis***” was submitted by Wan Nur Aqilah Binti Wan Mohd Samsudin, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry, in the Faculty of Applied Sciences, and was approved by

Dr. Ropisah Binti Me
Supervisor
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

Nurul Huda Abdul Halim
Project Coordinator
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

Mazni Musa
Head of Programme
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

Date: _____

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	x
ABSTRAK	xi
CHAPTER 1 INTRODUCTION	1
1.1 Background of study	1
1.2 Melastomataceae family	2
1.3 Problem statement	3
1.4 Significance of study	3
1.5 Objectives of study	4
CHAPTER 2 LITERATURE REVIEW	5
2.1 Classes of phytochemicals in plant	5
2.1.1 Alkaloids	5
2.1.2 Glycosides	6
2.1.3 Flavonoids	7
2.1.4 Phenolics	8
2.1.5 Tannins	9
2.1.6 Steroids	10
2.2 Phytochemical of Melastomaceae sp.	11
2.3 Uses of Melastomaceae sp.	16
2.3.1 Medicinal uses	16
2.3.2 Cosmetic uses	16
CHAPTER 3 METHODOLOGY	19
3.1 Materials	19
3.1.1 Raw Materials	19
3.1.2 Chemicals	19
3.1.3 Apparatus	19
3.1.4 Microorganisms	20
3.1.5 Instruments	20

3.2	Extraction of Melastomaceae sp. leaves	20
3.3	Phytochemical screening on the crude extracts	20
3.3.1	Test for alkaloids	21
3.3.2	Test for flavonoids	21
3.3.3	Test for saponins	21
3.3.4	Test for terpenoids	21
3.3.5	Test for tannins	21
3.3.6	Test for steroids	22
3.3.7	Test for phenols	22
3.4	Thin Layer Chromatography (TLC)	22
3.5	Antibacterial activity	23
3.5.1	General	23
3.5.2	Media preparation of Nutrient Agar (NA)	23
3.5.3	Culturing microbe of Nutrient Broth (NB)	24
3.5.4	Disc diffusion method	24
3.5.5	Control test	25
3.6	Antioxidant activity	26
CHAPTER 4 RESULTS AND DISCUSSION		27
4.1	Leaves extraction yields of <i>M. malabathricum</i> and <i>D. gracilis</i>	27
4.2	Thin layer chromatography (TLC) profile	29
4.3	Phytochemical screening of <i>M. malabathricum</i> and <i>D. gracilis</i>	33
4.4	Antibacterial activity on <i>M. malabathricum</i> and <i>D. gracilis</i>	36
4.4.1	Antibacterial activity on <i>M. malabathricum</i>	36
4.4.2	Antibacterial activity on <i>D. gracilis</i>	38
4.5	Antioxidant activity on <i>M. malabathricum</i> and <i>D. gracilis</i>	39
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS		43
5.1	Conclusion	43
5.2	Recommendation	45
CITED REFERENCES		46
APPENDICES		52
<i>CURRICULUM VITAE</i>		54

ABSTRACT

PHYTOCHEMICAL ANALYSIS AND BIOLOGICAL ACTIVITY OF *Melastoma malabathricum* AND *Dissochaeta gracilis*

This study is point out on Thin Layer Chromatography (TLC) profiling, phytochemical analysis, antibacterial activity and antioxidant activity of *Melastoma malabathricum* and *Dissochaeta gracilis*. Both of them are belongs to Melastomataceae family. Both samples were extracted by using cold extraction method with different polarity of solvent such as hexane, ethyl acetate and methanol to explore the solvent effect on the percentage yield extraction. TLC profiling was performed by different type of solvent system. Phytochemical analysis was done qualitatively to determine the presence of alkaloids, flavonoids, saponins, phenols, tannins, terpenoids and steroid compounds in all plant samples. Antibacterial activity was analyzing by disc diffusion method using four bacteria such as *Staphylococcus aureus*, *Bacillus subtilis*, *Salmonella typhi* and *Escherichia coli*. Antioxidant activity was done to determine the percentage of DPPH scavenging of the crude extracts. The results show that methanol crude extract has the highest percentage yield extraction as compared to other crude extracts. Both samples also show best solvent system which is hexane: ethyl acetate with ratio (8:2). The results also determined that steroids, flavonoids and terpenoids has been presence in all extract of both samples. However, they are absence in alkaloid compounds. Meanwhile, *M. malabathricum* and *D. gracilis* crude extracts has shown the presence of tannins, saponins and phenol compounds for ethyl acetate and methanol crude extracts but not in hexane crude extract. Apart from that, antibacterial activity show ethyl acetate and methanol crude extract give the higher inhibition of zone against all tested bacteria. Methanol crude extract for *D. gracilis* show a good free radical scavenging activity with an IC₅₀ value 54.24 µg/ml as compared to *M. malabathricum* with an IC₅₀ value of 111.90 µg/ml. As conclusion, this study discovered that *M. malabathricum* and *D. gracilis* leaves has a great potential as an active antimicrobial and antioxidant agents.