

UNIVERSITI TEKNOLOGI MARA

**PHYTOCHEMICAL ANALYSIS,
TOXICITY AND ANTIBACTERIAL
ACTIVITIES OF *Morinda citrifolia*
LEAVES**

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Thesis submitted in fulfilment
of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work on this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Undergraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

The rapid emergence of various diseases caused by bacterial infections are becoming a concern and have threatened human health. The most common diseases caused by bacterial infections are skin diseases. There are many plants have been identified with the properties of antimicrobial activity that has potential to combat bacteria. The main objective of this study is to evaluate the antibacterial activity of *Morinda citrifolia* leaves towards *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Pseudomonas aeruginosa*. Besides, the aim of this study is to identify the compounds present in *Morinda citrifolia* leaves by phytochemical analysis using gas chromatography and mass spectrometry (GC-MS) analysis. Another purpose of this study is to evaluate the toxicity properties of *M. citrifolia* leaves by using brine shrimp lethality bioassay (BSLA). Methods used for this study were plant extraction to obtain the methanolic extract of leaves, disc diffusion method to test the antibacterial activity of *Morinda citrifolia* leaves extract towards skin infection bacteria, Gas Chromatography-Mass Spectrometry Analysis (GC-MS) to identify the compounds present in *Morinda citrifolia* leaves and Brine Shrimp Lethality Bioassay (BSLA) to evaluate the toxicity properties of *Morinda citrifolia* leaves. The results of antibacterial activity screening have revealed that plant extract extract has antibacterial potential on all bacteria tested. GC-MS analysis has revealed major compounds such as are hydroxymethylfurfural (HMF), 4H-Pyran-4-one,2,3-dihydro-3,5-dihydroxy-6-methyl (DDMP), propanoic acid, 2-Methoxy-4-vinylphenol, oleic acid, ascorbic acid, 3-Methoxyacetophenone, 2,3,4,6-Tetramethylphenol, 2-Tetrazene,1,1-diethyl-4,4-dimethyl and sarcosine anhydride. Each compound contains beneficial properties such as antibacterial, antioxidant, anti-inflammatory, analgesic and anticancer activities. The calculated LC₅₀ value is 583.45 µg/ml which is considered low toxic to brine shrimps. In conclusion, *M. citrifolia* leaves have great potential as new sources of antibacterial agent that are fundamental to combat bacteria that cause skin infections.

TABLE OF CONTENTS

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ABSTRAK	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	ix
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF SYMBOLS	xii
LIST OF ABBREVIATIONS	xiii
LIST OF NOMENCLATURES	xiv
CHAPTER ONE: INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives of the Study	3
1.4 Significance of the Study	3
CHAPTER TWO: LITERATURE REVIEW	4
2.1 Bacterial Skin Infections	4
2.1.1 Overview	4
2.1.2 <i>Staphylococcus aureus</i>	4
2.1.3 <i>Staphylococcus epidermidis</i>	5
2.1.4 <i>Pseudomonas aeruginosa</i>	5
2.2 Noni (<i>Morinda citrifolia</i>)	6
2.2.1 Overview	6
2.2.2 Biological Activities of Noni Leaves	6
2.2.3 Chemical Composition of Noni Leaves	7
2.2.4 Medicinal Uses of Noni Leaves	7

3.5.5 Disc Diffusion Method	17
3.6 Phytochemical Analysis Using Gas Chromatography-Mass Spectrometry Analysis	18
3.7 Evaluation of Toxicity Using Brine Shrimp Lethality Bioassay	18
3.8 Statistical Analysis	19
CHAPTER FOUR: RESULTS AND DISCUSSIONS	
4.1 Percentage Yield of Plant Extracts	21
4.2 Antibacterial Activity of Plant Extract	22
4.3 GC-MS Analysis	25
4.4 Toxicity Evaluation	27
CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS	29
REFERENCES	31
APPENDICES	36
AUTHOR'S PROFILE	43