

UNIVERSITI TEKNOLOGI MARA

**COMPARATIVE ASSESSMENT OF
Citrus spp. IN PHYTOCHEMICAL
ANALYSIS, ANTIBACTERIAL
ACTIVITY AND DPPH
SCAVENGING ANALYSIS**

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of the requirements for degree of
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AUTHOR'S DECLARATION

I declare that the work in 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 *Citrus* spp. is the member of family Rutaceae, widely distributed in the tropical and subtropical countries. The rapid growth of the processing industry is demanding some natural antibacterial agents. Therefore, this study aims to determine the percentage yield of the *Citrus* spp. peel extracts using 95% ethanol, analysed phytochemical analysis as well as determine antibacterial and antioxidant activities. The peel extracts were prepared in 95% ethanol using rotary evaporator. The peel extracts of *Citrus* spp. were screened for the presence of biological compounds such as alkaloids, flavonoids, saponins, tannins and steroids. For the determination of the antibacterial activity of *Citrus* spp., the disc diffusion assay was used against *Staphylococcus aureus* (*S. aureus*) and *Staphylococcus epidermidis* (*S. epidermidis*). The *Citrus* spp. peel extracts were determined for its antioxidant properties using DPPH free radical scavenging activity. The result of this study showed *C. hystrix* had the highest percentage yield of crude extracts at 5.03% while the lowest was *C. aurantifolia* which was only 0.44%. The yield of crude extract of *C. microcarpa* was 0.76%. The phytochemical screening showed that the *Citrus* spp. have positive results regarding alkaloids, flavonoids, saponins, tannins and steroids. For antibacterial activity, Gram-positive bacteria of *S. aureus* and *S. epidermidis* were susceptible responds to the *C. hystrix* at concentration of 400 000 µg/ml. However, both bacteria were considered as intermediate response towards all combinations of *Citrus* spp. IC₅₀ value of DPPH free radical scavenging assay for *C. microcarpa* was 0.593 µg/ml revealed that *C. microcarpa* had the highest antioxidant compared to the *C. hystrix* and *C. aurantifolia*. As conclusion, *Citrus* spp. peels extract can be used efficiently as an alternative for the production of potential antibacterial agent and beneficial to the food industry.

TABLE OF CONTENTS

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ABSTRAK	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xii
CHAPTER ONE: INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Significance of Study	4
1.4 Objectives	5
CHAPTER TWO: LITERATURE REVIEW	6
2.1 General information	6
2.2 Overviews of <i>Citrus</i> spp.	7
2.2.1 <i>Citrus hystrix</i>	7
2.2.2 <i>Citrus microcarpa</i>	8
2.2.3 <i>Citrus aurantifolia</i>	8
2.3 Medicinal Plants	9
2.4 Mechanism of Action of Plant Secondary Metabolism	9
2.5 Phytochemical Screening	10
2.6 Nutritional and Phytochemical Contents of <i>Citrus</i> spp.	10
2.7 Flavonoid of Citrus Fruits	11

3.6 Bacterial Identification Test	21
3.6.1 Gram staining for Target Bacteria Strain	21
3.6.2 Biochemical Tests	22
3.7 Antibacterial Assay	23
3.7.1 Preparation of Agar Medium	23
3.7.2 Preparation of Nutrient Broth (NB)	23
3.7.3 Preparation of Bacterial Culture	23
3.7.4 Preparation the Log Phase of Bacterial Culture	24
3.7.5 Antibacterial Activity Determination	24
3.7.5.1 <i>Disc Diffusion Assay</i>	24
3.8 DPPH (2, 2-diphenyl -1-picrylhydrazyl) free radical scavenging assay	26
3.8.1 Preparation of DPPH working solution	26
3.8.2 Preparation of Ascorbic Acid	27
3.8.3 Preparation of Test Sample	27
3.8.4 Determination of Free Radical Scavenging Activity	27
3.9 Flow Chart of the Study	29
CHAPTER FOUR: RESULTS AND DISCUSSIONS	30
4.1 The Yield of Samples Extracted Samples	30
4.2 Analysis of Phytochemical screening	31
4.3 Analysis Antibacterial Activity	33
4.4 Antioxidant Activity	37
CHAPTER FIVE: CONCLUSION AND RECOMMENDATION	40
REFERENCES	41
APPENDICES	49
AUTHOR'S PROFILE	54