

**ANTIOXIDANT ACTIVITY OF BAMBOO LEAVES ESSENTIAL OIL
AND ITS POTENTIAL APPLICATION IN SKINCARE**

NURUL IZZAH BINTI MOHD ZUKRI

**Final Year Project Report Submitted in
Partial Fulfilment of the Requirement for the
Degree of Bachelor of Science (Hons.) Applied Chemistry
in Faculty of Applied Science
Universiti Teknologi MARA**

AUGUST 2023

This Final Year Project entitled “Antioxidant of Bamboo Leaves Essential Oil and Its Potential Application in Skincare” was submitted by Nurul Izzah Binti Mohd Zukri in partial fulfilment of the requirement for degree of Bachelor of Science (Hons.) Applied Chemistry, in Faculty of Applied Science, and was approved by

Encik Mohd Lias Bin Kamal
Supervisor
B. Sc. (Hons.) Applied Chemistry
Faculty of Applied Science
Universiti Teknologi MARA
02600 Arau
Perlis

Dr Siti Nurlia Binti Ali
Project Coordinator
B. Sc. (Hons.) Applied
Chemistry
Faculty of Applied Science
Universiti Teknologi MARA
02600 Arau
Perlis

Dr. Nasulhah Binti kasim
Head program of
B. Sc. (Hons.) Applied
Chemistry
Faculty of Applied Science
Universiti Teknologi MARA
02600 Arau
Perlis

Date: 14 July 2023

ABSTRACT

ANTIOXIDANT ACTIVITY OF BAMBOO LEAVES ESSENTIAL OIL AND ITS APPLICATION IN SKINCARE

The skincare developed by using extraction of *Bambusa Vulgaris* (bamboo leaves). This study is conducted as a result of skin issues such as wrinkles and pigmentation experience by most people. Besides, lack of natural antioxidant skincare in the market is concerning as people nowadays demand natural skincare due to high synthetic chemicals content in other skincare in the market which is not suitable for all skin type. Although this chemical skincare might aid in the treatment of skin problems, it has a number of negative side effects compared to positive results on both users and environment. As a solution to this issue, organic herbal skincare has been created and formulated. Wrinkles have been identified as the most common issue for middle age. This is because human skin is consistently exposed to radicals such as UV rays and other harmful pollutants such as cigarette smoke, also skin collagen will slowly reduce when reach age of 27 years old and above. The polyphenols and phenolic acid in the bamboo leaves essential oil are studied in this investigation since both of these bioactive compounds are responsible for antioxidant properties. The study examined the effectiveness of antioxidants by Radical Scavenging Activity assay. Besides, this study also determined the total phenolic compound in the essential oil. The oil are proven to have the ability as antioxidants as all the assays show positive results. This demonstrates that every essential oil extract has antioxidants agents such as flavonoids, polyphenols and phenolic acid as their compounds. This has demonstrated the possibility of creating skincare from natural sources like *Bambusa Vulgaris* to treat skin issues caused by radical and low deficiency of antioxidants such as pigmentation and wrinkles.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
ABSTRAK	iv
TABLE OF CONTENT	v
LIST OF TABLES	vii
LIST OF PLATES	viii
LIST OF FIGURES	ix
LIST OF SYMBOLS	x
LIST OF ABBRIVIATION	xi
CHAPTER 1 INTRODUCTION	
1.1 Background of study	1
1.2 Problem statement	8
1.3 Significance of study	10
1.4 Objectives of study	12
CHAPTER 2 LITERATURE REVIEW	
2.1 introduction	13
2.2 Chemical constituent of bamboo leaves	13
2.3 Common application of bamboo	15
2.3.1 Protein	17
2.3.2 Vitamins	18
2.3.3 Phenols	19
2.4 Polyphenols as antioxidants	20
2.5 Comparison from previous study	23
2.6 Extraction method	25
2.7 Chemical test	26
2.7.1 Phytochemical qualitative analysis	27
2.7.2 Total phenolic content	28
2.7.3 Antioxidant analysis	29
CHAPTER 3 METHODOLOGY	
3.1 Introduction	31
3.2 Chemicals and materials	32
3.2.1 Raw materials	32
3.2.2 Chemicals	32
3.3 Apparatus and instruments	33
3.3.1 UV/Vis Spectrometer	33
3.3.2 Fourier Transform Infrared (FTIR)	33
3.4 Methods of Sample Extraction and Analysis	34

3.4.1	Extraction of bamboo leaves essential oil	34
3.4.2	Phytochemicals qualitative analysis	35
3.4.1	Test for saponin	35
3.4.2	Test for flavonoid	36
3.4.3	Test for terpenoid	36
3.4.4	Test for phenol	36
3.4.5	Test for tannin	36
3.5	Determination of total phenolic content	37
3.6	Determination of radical scavenging activity	38

CHEPTEr 4 RESULT AND DISCUSSION

4.1	Bamboo leaves essential oil extraction	41
4.2	Phytochemical test of plant extract	43
4.3	Determination of Total Phenolic Content in bamboo essential oil	45
4.5	Determination of Radical Scavenging Activity potential of bamboo essential oil.	51
4.6	FTIR analysis	56

CHAPTER 5 CONCLUSION AND RECOMMENDATION

5.1	Conclusion	58
5.2	Recommendation	60