

**ANTIOXIDANT STUDY OF EXTRACTED *Areca catechu* NUT
AND ITS POTENTIAL AS HAIR OIL'S ADDITIVE**

FATIN ATIQA BINTI MOHAMMAD ADZUAN

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

FEBRUARY 2023

**ANTIOXIDANT STUDY OF EXTRACTED *Areca catechu* NUT AND ITS
POTENTIAL AS HAIR OIL'S ADDITIVE**

FATIN ATIQAH BINTI MOHAMMAD ADZUAN

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

FEBRUARY 2023

This Final Year Project Report entitled “**Antioxidant Study of Extracted *Areca catechu* Nut and its Potential as Hair Oil’s Additive**” was submitted by Fatin Atiqah binti Mohammad Adzuan in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry with Management, in the Faculty of Applied Science and was approved by

Madam Shafinas Binti Abdullah
Supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

Dr. Siti Nurlia Ali
Program Coordinator
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

Dr. Zuliahani Ahmad
Head Centre of Studies
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

Date: FEBRUARY 2023

ABSTRACT

ANTIOXIDANT STUDY OF EXTRACTED *Areca catechu* NUT AND ITS POTENTIAL AS HAIR OIL'S ADDITIVE

Hair loss affects more than 80% of men and nearly half of women especially as they approach middle age or experiencing the stress of difficulties in daily lives. Nowadays, too many hair care products are based on synthetic formulations. Not only that, but many manufacturers of hair care products are more concerned about the amount of production that can be sold than the quality and safety of consumers. Thus, this study aimed to identify the chemical constituents in *Areca catechu* nut extract by using the phytochemical screening and FTIR analysis, to examine the antioxidant properties using the total phenolic content (TPC), DPPH free radical scavenging assay and to formulate and analyze the hair oil using extracted *Areca catechu* nut. The dried *Areca catechu* nut was successfully extracted by maceration extraction technique with the percentage yield of 41.46%. The phytochemical screening showed the presence of alkaloid, flavonoid, tannins, saponin and phenolic while the FTIR analysis revealed the predominant functional group of alcohol and carbonyl group at peak 3321 cm^{-1} and 1044 cm^{-1} . The antioxidant activity demonstrates that the ethanolic extracts of *Areca catechu* nut showed the highest inhibitory DPPH free radical up to 93.79% at 100 ppm. The total phenolic content obtained in this study is 10.38 mg GAE/g. The hair oil was successfully prepared, and stability tests included pH, irritation and organoleptic were analyzed. Hence, this formulation with the addition of *Areca catechu* nut has a great potential to be commercialized as a potent natural product hair oil that can help in reducing hair loss and promotes hair growth.

TABLE OF CONTENTS

	Page
ABSTRACT	iii
ABSTRAK	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF SYMBOLS	x
LIST OF ABBREVIATIONS	xi
CHAPTER 1 INTRODUCTION	1
1.1 Background of study	1
1.2 Problem statement	4
1.3 Research questions	5
1.4 Objective of study	5
1.5 Significance of study	6
1.6 Expected outcome	6
CHAPTER 2 LITERATURE REVIEW	8
2.1 Hair	8
2.2 <i>Areca catechu</i> nut	9
2.2.1 Types of <i>Areca catechu</i> nut	11
2.3 Extraction method of <i>Areca catechu</i> nut	13
2.4 Bioactive compound in <i>Areca catechu</i> nut	14
2.5 Preliminary of phytochemical	15
2.6 Antioxidant activity in <i>Areca catechu</i> nut	16
2.6.1 Total Phenolic Contents (TPC)	17
2.6.2 DPPH radical scavenging activity	18
2.7 Hair oil	19
2.7.1 Benefits of ingredients used in the formulation of hair oil	19
2.7.2 Stability test on hair oil	20
CHAPTER 3 METHODOLOGY	23
3.1 Materials and Chemicals	23
3.1.1 Raw materials	23
3.1.2 Chemicals	23
3.2 Apparatus and Instruments	24
3.2.1 Apparatus	24
3.2.2 Instruments	24
3.2.2.1 UV-Visible spectrophotometer	24
3.2.2.2 Spectronic 20	25