

UNIVERSITI TEKNOLOGI MARA

**ANTIMICROBIAL PROPERTIES
AND TOXICITY TEST OF AJWA
DATE (*Phoenix dactylifera L.*) SEEDS,
STINGLESS BEE HONEY (*Trigona
itama*) AND THEIR COMBINATIONS**

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Thesis submitted in fulfillment
of the requirements for the degree of
Bachelor in Science (Hons.) Biology

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AUTHOR'S DECLARATION

I declare that the work in this proposal 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 proposal 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 Undergraduates, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Skin diseases are one of the major diseases that were recorded to origin from bacteria. Some of these bacteria have mutated into multidrug-resistance bacteria where current treatment or drugs are becoming less effective towards these mutant bacteria. This study focused on identifying the antibacterial properties and the toxicity of stingless bee honey and Ajwa date seeds through disc diffusion assay and brine shrimp lethality assay. The effectiveness of stingless bee honey and Ajwa date seeds alone and followed with their combinations as antibacterial agent against *Staphylococcus aureus* and *Staphylococcus epidermidis* were tested through disc diffusion assay. The toxicity of the samples was tested through cytotoxicity test of brine shrimp lethality assay. Based on the result both samples of stingless bee honey and Ajwa date seeds alone exhibit zone of inhibition with diameter of 9.67 mm for Ajwa date seeds alone against *Staphylococcus aureus* and 10.17 mm for stingless bee honey against *Staphylococcus epidermidis* at concentration of 100 µg/ml. 1:1 combinations of both samples showed an increment against both bacteria as compared alone with diameter of 13.33 mm respectively for both *Staphylococcus aureus* and *Staphylococcus epidermidis*. The composition that contribute to the higher increment of their antibacterial properties are due to the presence of hydrogen peroxide in stingless bee honey and also phenolic content of Ajwa date seeds such as oleic and lauric acid. The toxicity of stingless bee honey and Ajwa date seeds were determined using cytotoxicity test as to determine the toxicity value of both sample that qualify them to have the potency to act as drugs. It is found that both samples of stingless bee honey and Ajwa date seeds are toxic against cancer cell line with LC₅₀ value of 254.474 µg/ml and 391.918 µg/ml. For combination, all ratio exhibited the same percent of mortality with value of 40% respectively. As conclusion, this study proved that stingless bee honey and Ajwa date seeds have the antimicrobial properties that can fight against multidrug resistance bacteria and have a high potential in becoming the new source as for combating skin infections bacteria.

TABLE OF CONTENT

	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	xiii
LIST OF SYMBOLS	xiv
CHAPTER ONE: INTRODUCTION	
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Objectives of Study	4
1.4 Significance of Study	4
CHAPTER TWO: LITERATURE REVIEW	
2.1 Skin Infections or Skin Disease	
2.1.1 Skin Infection	5
2.1.2 Therapeutic Approach in Treating Skin Infection	9
2.2 Natural Therapies Using Natural Antibacterial Agent	
2.2.1 Current Natural Therapies That Exhibit Antibacterial Properties Against Skin Disease	10
2.2.2 Stingless Bee Honey As Natural Antibacterial Agent	12
2.2.3 Ajwa Date Seeds As Natural Antibacterial Agent	14
2.3 Combination Study On The Effect Of Stingless Bee Honey and Date Seeds with Other Constituents as Antimicrobial Agent	17
2.4 Evaluation of Toxicity	19

CHAPTER THREE: RESEARCH METHODOLOGY

3.1	Material	20
3.2	Methods	20
3.2.1	Physicochemical Test of Stingless Bee Honey	
3.2.1.1	<i>Moisture Test</i>	21
3.2.1.2	<i>Ash Test</i>	21
3.2.1.3	<i>pH Test</i>	22
3.2.2	Extraction Of Ajwa Date Seeds, <i>Phoenix Dactylifera</i>	23
3.2.3	Medium Preparation	23
3.2.3.1	<i>Preparation of Nutrient Broth</i>	23
3.2.3.2	<i>Preparation of Nutrient Agar</i>	24
3.2.3.3	<i>Preparation of Mueller Hinton Agar (MHA)</i>	24
3.2.4	Preparation of Bacterial Growth	
3.2.4.1	<i>Preparation of Inoculum to 0.5MacFarland Standard</i>	24
3.2.5	Antibacterial Evaluation Activity	
3.2.5.1	<i>Disc Diffusion Assay</i>	25
3.2.6	Cytotoxicity Test	
3.2.6.1	<i>Brine Shrimp Lethality Assay</i>	26
3.3	Statistical Analysis	26

CHAPTER FOUR: RESULT AND DISCUSSION

4.1	Extraction of Ajwa Date Seeds, <i>Phoenix dactylifera L.</i>	27
4.2	Physicochemical Test of Stingless Bee Honey, <i>Trigona Itama</i>	27
4.3	Antibacterial Activity	
4.3.1	Disc Diffusion Assay towards <i>Staphylococcus aureus</i>	30
4.3.2	Disc Diffusion Assay towards <i>Staphylococcus epidermidis</i>	40
4.4	Brine Shrimp Lethality Assay	47