

UNIVERSITI TEKNOLOGI MARA

**ANTIMICROBIAL ACTIVITY OF *ALLIUM*
SATIVUM EXTRACT AGAINST ANTECUBITAL
FOSSA BACTERIA**

By

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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 the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not submitted to any other academic institution or non-academic institution for any degree or qualification.

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ACKNOWLEDGMENT

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TABLE OF CONTENTS

DECLARATION	Page ii
INTELLECTUAL PROPERTIES	iii
ACKNOWLEDGMENT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF ABBREVIATIONS	xiv
ABSTRACT	xv
1. INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Significance of the Study	4
1.4 Research Objective	5
1.4.1 General Objectives	5
1.4.2 Specific Objectives	5
1.5 Hypothesis	6
1.5.1 Study Hypothesis	6
1.5.2 Null Hypothesis	6
2. LITERATURE REVIEW	7
2.1 Introduction of <i>Allium sativum</i>	7
2.1.1 Garlic as Traditional Medicine	9
2.1.2 <i>Allium sativum</i> as An Antimicrobial Agent and Its Bioactive Compound	10
2.2 Antecubital Fossa	13
2.2.1 Skin Disinfectant	14
2.3 Human Skin Microorganism	14
2.3.1 <i>Staphylococcus aureus</i>	15
2.3.2 <i>Staphylococcus epidermidis</i>	15
2.3.3 <i>Streptococcus pyogens</i>	16
2.3.4 <i>Pseudomonas aeruginosa</i>	16

ABSTRACT

ANTIMICROBIAL ACTIVITY OF ALLIUM SATIVUM EXTRACT AGAINST ANTECUBITAL FOSSA BACTERIA

Certainly, different techniques of reducing a load of bacterial contamination at antecubital fossa have been attempted and always being improvised especially for phlebotomy procedure. People have tried to explore the healing power of different plant extract and treat disease. Several studies have reported that there are some contradict about the effectiveness of commercial antiseptic in reduce bacterial contamination. Some studies on hand disinfection with alcohol-based hand rubs showed that during the hand rubbing procedure, users are exposed to these alcohols not only through dermal contact but also via inhalation. This is due to physical and chemical properties volatilizing from alcoholic solutions or gels into the air. Therefore, identification of antimicrobial activity in *Allium sativum* (garlic) against bacterial skin especially on antecubital fossa was studied for the potential uses as alternatives antiseptic. Three types of extracts were used in this study which were aqueous garlic extract (AGE), ethanolic garlic extract (EGE) and ethanolic garlic powder extract (EGPE). Their effects were measured against normal flora and pathogenic bacteria namely *Staphylococcus aureus* (ATCC 25923), *Staphylococcus epidermidis* (ATCC 1228), *Streptococcus pyogenes* (ATCC 25922) and *Pseudomonas aeruginosa* (ATCC 10145) using well diffusion technique. EGPE was unable to produce any inhibition zone against all tested bacteria. Out of four bacteria tested, three bacteria were found to be sensitive towards AGE and EGE including *S. aureus*, *S. epidermidis* and *S. pyogenes*. On the other hand, *P. aeruginosa* only sensitive to EGE and exhibited high resistance to AGE. AGE and EGE showed promising inhibitory activity even in low concentration against *S. pyogenes* with minimal inhibitory concentration (MIC) value of 125 mg/ml and 15.63 mg/mL, respectively. Both extracts showed significant antimicrobial effect against *S. aureus* at 62.5 mg/mL while *S. epidermidis* at 7.81 mg/mL. EGE also showed significant antimicrobial effect against *P. aeruginosa* until with MIC value of 62.5 mg/mL. In conclusion, *Allium sativum* extracts showed substantial antimicrobial activity against the majority of the tested bacteria ($p < 0.05$) and it can be a good source of antimicrobial agents thus it can become an alternative to the commercial alcohol-based antiseptic.

Keywords: Antimicrobial activity, Garlic, Ethanol extract, Aqueous Extract, Antecubital fossa bacteria