

**REPELLENT ACTIVITY OF MIXED FORMULATION OF TWO  
ESSENTIAL OIL (LEMON GRASS AND CLOVE OIL) AGAINST  
GRASSHOPPER**

**NUR AMALINA BINTI OTHMAN**

**BACHELOR OF SCIENCE (Hon.) BIOLOGY  
FACULTY OF APPLIED SCIENCE  
UNIVERSITI TEKNOLOGI MARA**

**DECEMBER 2018**

This Final Year Project Report entitled **“REPELLENT ACTIVITY OF MIXED FORMULATION OF TWO ESSENTIAL OIL (LEMON GRASS AND CLOVE OIL) AGAINST GRASSHOPPER”** was submitted by Nur Amalina Binti Othman, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Biology, in the Faculty of Applied Sciences and was approved by

---

Syazuani binti Mohd Shariff  
Supervisor  
Faculty Of Applied Science  
Universiti Teknologi Mara (UITM)  
Negeri Sembilan, Kampus Kuala Pilah  
Pekan Parit Tinggi, 72000 Kuala Pilah  
Negeri Sembilan.

---

Siti Norazura Binti Jamal  
Coordinator FSG661 AS201  
Faculty Of Applied Science  
Universiti Teknologi Mara (UITM)  
Negeri Sembilan, Kampus Kuala Pilah  
Pekan Parit Tinggi, 72000 Kuala Pilah  
Negeri Sembilan.

---

Dr. Aslizah binti Mohd Aris  
Head of Biology School  
Faculty Of Applied Science  
Universiti Teknologi Mara (UITM)  
Negeri Sembilan, Kampus Kuala Pilah  
Pekan Parit Tinggi, 72000 Kuala Pilah  
Negeri Sembilan.

Date:-----

## TABLE OF CONTENTS

	<b>PAGE</b>
<b>ACKNOWLEDGEMENTS</b>	<b>iii</b>
<b>TABLE OF CONTENTS</b>	<b>iv</b>
<b>LIST OF TABLES</b>	<b>vii</b>
<b>LIST OF FIGURES</b>	<b>viii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>ix</b>
<b>ABSTRACT</b>	<b>x</b>
<b>ABSTRAK</b>	<b>xi</b>
<b>CHAPTER 1: INTRODUCTION</b>	
1.1 Background Study	1
1.2 Problem Statement	2
1.3 Significance of the Study	3
1.4 Objectives of the Study	3
<b>CHAPTER 2: LITERATURE REVIEW</b>	
2.1 Grasshopper	4
2.2 Essential Oils	5
2.3 Lemongrass ( <i>Cymbopogon citratus</i> )	6
2.4 Cloves ( <i>Syzygium aromaticum</i> )	8
2.5 Two Essential Oils and Their Powerful Mix Formulation As Insect Repellent	9

**CHAPTER 3: METHODOLOGY**

3.1	Grasshopper	11
3.2	Essential oils	11
3.3	Laboratory test	12

**CHAPTER 4: RESULTS AND DISCUSSION**

4.1	Repellency of essential oils against grasshopper	13
-----	--	----

**CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS** 21

**CITED REFERENCES** 22

**APPENDICES** 26

**CURRICULUM VITAE** 27

## ABSTRACT

### REPELLENT ACTIVITY OF MIXED FORMULATION OF TWO ESSENTIAL OIL (LEMON GRASS AND CLOVE OIL) AGAINST GRASSHOPPER

Two essential oils extracted from the plant species lemon grass (*Cymbopogon citratus*) and clove (*Syzygium aromaticum*) were involved in the repellent activity against the grasshopper. The mixture of the two essential oil showed the best repellency over the single essential oil. The aim of the study was determine the repellent activity of two essential oil that were lemon grass (*Cymbopogon citratus*) and clove oil (*Syzygium aromaticum*) and their mixed formulation to the grasshopper. Besides, the efficiency of the essential oil towards the grasshopper at five different concentration of the ethanol (5%, 10%, 20%, 50% and 100% were examined. Other than that, the essential oils were extracted by using the rotary evaporator machine in the laboratory. The mixed formulation of essential oil (clove oil and lemon grass oil) exhibited the higher repellency against the grasshopper at 100% and 50% concentration of the ethanol when diluted together with the mixed formulation of the essential oils from about 85% to 90% of repellency compared to 20% concentration with 80% repellency, 10% concentration with 75% repellency and 5% concentration with 80% repellency. The control site that was not treated with essential oils was smeared with the chemical insecticides and show the lower in repellency about 73% compared to the five concentration of essential oils. This shows that the essential oils from the plant was more effective and safe to be used compared to the chemical repellent. Lastly, the natural or organic extraction from the plant will not cause the pollution to the environment and safe to be used and five concentration of the essential oils (100%, 50%, 20%, 10% and 5%) have been used to reduce the population of the grasshopper.