

ANTI-CHOLINERGIC AND ANTIMICROBIAL PROPERTIES  
OF *Sonneratia alba* (Perepat)

SITI ZAHARAH BINTI SHARUDIN

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SCHOOL OF MARINE SCIENCE AND ENVIRONMENT  
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**Anti-Cholinergic and Antimicrobial Properties Of *Sonneratia alba* (Perepat).**

**By**

**Siti Zaharah Binti Sharudin**

**Research Report submitted in partial fulfillment of  
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SCHOOL OF MARINE SCIENCE AND ENVIRONMENT  
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**DECLARATION AND VERIFICATION REPORT**  
**FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled Anti-cholinergic and Antimicrobial Properties of *Sonneratia alba* (Perepat) by Siti Zaharah Binti Sharudin. Matric No. UK25178 have been examined and all errors identified have been corrected. This report is submitted to the School of Marine Science and Environment as partial fulfillment towards obtaining the Degree of Marine Biology School of Marine Science and Environment, Universiti Malaysia Terengganu.

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## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENTS</b>	ii
<b>TABLE OF CONTENT</b>	iii
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>LIST OF APPENDICES</b>	ix
<b>ABSTRACT</b>	x
<b>ABSTRAK</b>	xi
<b>CHAPTER 1: INTRODUCTION</b>	
1.1 Background of the study	1
1.2 Justification	4
1.3 Aims and Objective	4
<b>CHAPTER 2: LITERATURE REVIEW</b>	
2.1 Mangrove	5
2.1.1 Mangrove forest	5
2.1.2 Mangrove in Malaysia	6
2.1.3 Traditional uses of Mangrove	7
2.2 <i>Sonneratia alba</i>	7
2.2.1 Botanical description	7
2.2.2 Traditional uses	8
2.2.3 Phytochemical characteristic	8

### **CHAPTER 3: METHODOLOGY**

3.1	Plant material	10
3.2	Acetyl cholinesterase enzyme inhibitory activity	10
3.3	Disc diffusion assay	11
3.4	Micro-dilution Antibacterial Assay	12
3.5	Qualitative phytochemical analysis	13
3.5.1	Test for protein	13
3.5.2	Test for carbohydrates	13
3.5.3	Test for phenol and tannins	14
3.5.4	Test for flavanoids	14
3.5.5	Test for saponins	14
3.5.6	Test for glycoside	14
3.5.7	Test for steroids	15
3.5.8	Test for terpenoids	15
3.5.9	Test for alkaloids	15

### **CHAPTER 4: RESULTS**

4.1	Acetyl cholinesterase enzyme inhibitory activity	16
4.2	Anti-microbial activity	17
4.3	Phytochemical screening	22

### **CHAPTER 5: DISCUSSION**

5.1	Anti-cholinergic properties	24
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5.2	Anti-microbial properties	25
5.3	Phytochemical analysis	27
	<b>CHAPTER 6: CONCLUSION AND RECOMMANDATION</b>	28
	<b>REFERENCES</b>	29
	<b>APPENDICES</b>	33
	<b>CURRICULUM VITAE</b>	35

## LIST OF TABLES

Table	Page
4.1 Percentage inhibition (%) of acetyl cholinesterase enzyme inhibitory activity by leaf and bark extract obtained from <i>S.alba</i> as determined by micro plate assay.	17
4.2 Percentage inhibition (%) of acetyl cholinesterase enzyme inhibitory activity by the galanthamine as determined by micro plate assay.	17
4.3 Antimicrobial activity is expressed as a ratio of the inhibition zone produced by the leaf and bark extract of <i>Sonneratia alba</i> (10mg/ml) to the inhibition zone produced by the gentamicin standard (0.2mg/ml).	20
4.4 Minimum Inhibitory Concentration (MIC) of the plant extract (mg/ ml) obtained from leaf and bark extract of <i>Sonneratia alba</i> as determined by the micro dilution assay	21
4.5 Determination of the major classes of chemical components of the leaves and bark extracts of <i>S. alba</i>	23

## LIST OF FIGURES

<b>Figure</b>		<b>Page</b>
4.1	Sample does not kill the bacteria on the agar plate	18
4.2	Sample shows a bacteriostatic effect to the bacteria tested but control was active against the bacteria on the agar plate	18
4.3	Control for micro dilution antibacterial assays	21
4.4	Determination of minimum inhibitory concentration (MIC mg/ml) of ethyl acetate barks extract against five bacteria using micro dilution antibacterial assays.	22

## LIST OF ABBREVIATIONS

$\mu\text{l}$	-	microliter
C	-	Celcius
cm	-	centimeter
g	-	gram
M	-	Molar
mg	-	miligram
ml	-	mililiter
mM	-	milimolar
nm	-	nanometer
U	-	Unit

## LIST OF APPENDICES

Appendix		Page
1	Disc diffusion assays	33
2	Acetyl cholinesterase enzyme inhibitory activity	33
3	Leaf and Bark of <i>Sonneratia alba</i>	34
4	Calculation on Percentage inhibitory of acetyl cholinesterase enzyme inhibitory activity	34

## ABSTRACT

Plants have been widely used as the medicine because of their medicinal value. In this study, we used two assays to identify the medicinal value that contained in mangrove plant *Sonneratia alba*. The antimicrobial activity of leaf and bark extract of *S.alba* in three different solvent such as dichloromethane, ethyl acetate and methanol was determine by using two in vitro model, disc diffusion assays and minimum inhibitory concentration (MIC) assays against five species of pathogenic bacteria such as *Staphylococcus aureus*, *Klebsiella pnuemoniae*, *Salmonella typhii*, *Escherichia coli*, and *Bacillus cereus*. In disc diffusion method, freeze dried leaf methanol extract was show the highest inhibition zone that others with  $1.45\pm 0.15$  mg/ml against *Staphylococcus aureus*. The result in MIC also showed that freeze dried leaf extract give the lowest concentration in inhibiting the growth of bacteria with the value  $0.097\pm 0$  mg/ml against *Staphylococcus aureus*. Alkaloids and terpenoids were present in all three different extract in phytochemical analysis. For the acetyl cholinesterase enzyme inhibitory activity, the percentage inhibition of the sample to the acetylcholine activity was decreased with the decreasing of concentration of sample except for the ethyl acetate bark abstract, the percentage inhibition of the sample was increase with the decreasing of concentration of the sample. This study shows that bark and leaf part of *S. alba* can be suggested to be an antimicrobial and anti cholinesterase agent.

## CIRI-CIRI ANTI-KOLINERGIK DAN ANTI-MIKROBIAL DALAM *Sonneratia alba* (PEREPAT)

### ABSTRAK

Tumbuh-tumbuhan telah digunakan secara meluas sebagai ubat kerana nilai perubatan. Dalam kajian ini, kami menggunakan dua ujian untuk mengenal pasti nilai perubatan yang terkandung dalam tumbuhan paya bakau *Sonneratia alba*. Aktiviti antimikrob ekstrak daun dan kulit kayu *S. alba* dalam tiga pelarut yang berbeza seperti diklorometana, etil asetat dan metanol menentukan dengan menggunakan dua dalam vitro model, ujian cakera penyebaran dan kepekatan perencatan minimum (MIC) ujian terhadap lima spesies bakteria patogenik seperti *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Salmonella typhi*, *Escherichia coli*, dan *Bacillus cereus*. Dalam kaedah cakera penyebaran, beku kering daun ekstrak metanol adalah menunjukkan zon perencatan tertinggi yang lain dengan  $1.45 \pm 0.15$  mg / ml terhadap *Staphylococcus aureus*. Keputusan dalam MIC juga menunjukkan bahawa pembekuan ekstrak daun kering memberikan kepekatan yang paling rendah dalam menghalang pertumbuhan bakteria dengan nilai  $0.097 \pm 0$  mg / ml terhadap *Staphylococcus aureus*. Alkaloid dan terpenoid hadir di ketiga-tiga ekstrak yang berbeza dalam analisis fitokimia. Untuk cholinesterase asetil yang enzim aktiviti yg melarang, perencatan peratusan sampel untuk aktiviti asetilkolina itu menurun dengan penurunan kepekatan sampel kecuali etil asetat kulit abstrak, perencatan peratusan sampel peningkatan dengan penurunan kepekatan sampel. Kajian ini menunjukkan bahawa kulit pokok dan daun daripada *S. alba* boleh dicadangkan untuk menjadi ejen anti kolinesterase dan antimikrob.