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

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SCHOOL OF MARINE SCIENCE AND ENVIRONMENT
UNIVERSITI MALAYSIA TERENGGANU

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By

Siti Zaharah Binti Sharudin

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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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µl	-	microliter
C	-	Celcius
cm	-	centimeter
g	-	gram
M	-	Molar
mg	-	miligram
ml	-	mililiter
mM	-	milimolar
nm	-	nanometer
U	-	Unit

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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±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±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 pnuemoniae, Salmonella typhii, Escherichia coli,* dan *Bacillus cereus*. Dalam kaedah cakera penyebaran, beku kering daun ekstrak metanol adalah menunjukkan zon perencatan tertinggi yang lain dengan 1.45 ± 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 ± 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.