

**CHEMICAL CONSTITUENTS AND *ANTIPLASMODIAL*  
ACTIVITY OF INDOLE ALKALOIDS FROM  
*OCHROSIA OPPOSITIFOLIA***

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**FACULTY OF SCIENCE  
UNIVERSITY OF MALAYA  
KUALA LUMPUR**

**2010**

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**DISSERTATION SUBMITTED IN FULFILMENT  
OF THE REQUIREMENTS FOR THE DEGREE  
OF MASTER OF SCIENCE**

**DEPARTMENT OF CHEMISTRY  
FACULTY OF SCIENCE  
UNIVERSITY OF MALAYA  
KUALA LUMPUR**

**2010**

## ACKNOWLEDGEMENT

From my deepest heart and my greatest appreciation go to my supervisor Professor Dr Khalijah Awang for her kindly good supervision, advices, patience and guidance throughout the course in this study. I also would like to express my greatest thanks to Professor Datuk. Dr. A. Hamid A. Hadi and Professor Madya Dr. Mat Ropi Mukhtar for their help and encouragement in this research work.

I also wish to extend my thanks to Mr. Din, Mr Teo, Mr Hazri and Mr Rafli (staffs of the Herbarium), Ms Norzalida, Mr azizul and Mrs Fiona (for recording NMR data), Mr Siew (for recording MS data), my friends in the Phytochemistry Laboratory, especially: Dr Azlan, Dr Kartini, Azmi, Ibrahim, Omer Hmadi, Ahmad Kaleem, Yalda Kia, Chan ghomati, Chong Soon Lim, Dewi Rosmi, Hazrina, Vicky, Fadzly, Norsita, Aimi, Aza, and others for their help and friendship.

Finally, I would like express my special appreciation to my family (Mother and Father), brother and sisters.

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## ABBREVIATION

$\alpha$	Alpha
$\beta$	Beta
$\lambda$	Maximum wave length
$\delta$	Chemical shift
$\mu\text{M}$	Micromolar
$\mu\text{l}$	Microlitre
$\mu\text{g/ml}$	Microgram per mililitre
mM	Milimolar
mg/ml	Milligram per mililitre
g	Gram
kg	Kilogram
U/ml	Unit per mililitre
ml	Mililitre
m	Meter
MHz	Mega Hertz
Hz	Hertz
UV	Ultraviolet
IR	Infrared
mM	Milimolar
ppm	Part per million
eV	Electron Volt
MeOH	Methanol
$\text{CHCl}_3$	Chloroform
$\text{CH}_2\text{Cl}_2$	Dichloromethane

DMSO	Dimethylsulphoxide
OCH <sub>2</sub> O	Methylenedioxy
CH <sub>3</sub>	Methyl group
OCH <sub>3</sub>	Methoxyl group
OH	Hydroxyl group
NH <sub>3</sub>	Ammonia
pH	Power of Hydrogen
HCl	Hydrogen Chloride
TLC	Thin layer chromatography
PTLC	Preparative thin layer chromatography
CC	Column chromatography
NMR	Nuclear Magnetic Resonance
FT-NMR	Fourier Transform Nuclear Magnetic Resonance
cm <sup>-1</sup>	Per centimeter
<i>J</i>	Coupling constant
<i>d</i>	Doublet
<i>s</i>	singlet
<i>dd</i>	Doublet of doublet
<i>t</i>	triplet
<i>m</i>	multiplet
BBIQ	Bisbenzylisoquinoline
1D-NMR	One Dimension Nuclear Magnetic Resonance
2D-NMR	Two Dimension Nuclear Magnetic Resonance
<sup>1</sup> H	Proton NMR
<sup>13</sup> C	13-Carbon NMR

COSY	$^1\text{H}$ - $^1\text{H}$ Correlation Spectroscopy
DEPT	Distortionless Enhancement by Polarization Transfer
HMQC	Heteronuclear Multiple Quantum Coherence
HMBC	Heteronuclear Multiple Bond Coherence
NOE	Nuclear Overhauser Enhancement
GC-MS	Gas Chromatography-Mass Spectroscopy
MS	Mass Spectroscopy
EIMS	Electron Impact Mass Spectroscopy
FAB	Fast Atomic Bombardment
ESI	Electrospray Ionization
m/z	Mass per charge
$\text{CDCl}_3$	Deuterated chloroform
MeOD	Deuterated methanol
OD	Optical density

## ABSTRACT

The chemical constituents of *Ochrosia oppositifolia* have been studied. The compounds were extracted from the bark and leaves of this plant by using *n*-hexane, dichloromethane and methanol as solvents. The crudes were subjected to extensive chromatographic techniques like preparative thin layer chromatography, column chromatography and high performance liquid chromatography (HPLC). A total of six compounds were obtained. Structural elucidation was established through several spectroscopic methods, such as 1D-NMR (<sup>1</sup>H, <sup>13</sup>C, DEPT, NOE), 2D-NMR (COSY, NOESY, HMQC, and HMBC), UV, IR, and MS (GCMS, LCMS and HRMS) and comparison with the published data.

Three compounds were isolated from the bark of *Ochrosia oppositifolia*, one indole alkaloid which is isoreserpiline **1** and two ferulic acid ester namely 2-propenoic acid, 3-(4-hydroxy-3,5-dimethoxyphenyl)-,methylester **E 73** and 17-methoxy-carbonyl-14-heptadecaenyl- 4-hydroxy-3-methoxy cinnamate **F 74**.

Isolation and purification of alkaloids from the leaves of *Ochrosia oppositifolia* afforded three indole alkaloids namely neisosposinine **2**, reserpine **3** and alkaloid D **72**.

All crude extracts and pure compounds were tested for anti plasmodial activity, and the hexane crude of bark showed the highest activity with an IC<sub>50</sub> of 0.0505 µg/mL. Among the alkaloids tested, alkaloid D **72** is the most potent compound with an IC<sub>50</sub> of 0.0123 µmol L<sup>-1</sup>

## ABSTRAK

Kandungan kimia daripada *Ochrosia oppositifolia* telah dikaji. Sebatian kimia daripada batang dan daun daripada pokok ini telah diekstrak dengan menggunakan pelarut *n*- heksana, diklorometana dan methanol. Ekstrak- ekstrak tersebut telah disubjekkan kepada teknik- teknik kromatografi ekstensif seperti kromatografi lapisan nipis preparative, kromatografi turus dan kromatografi cecair prestasi tinggi (HPLC).

Sebanyak enam sebatian kimia telah diisolasikan daripada pokok ini; elusidasi struktur telah dilakukan melalui beberapa kaedah spektroskopi, seperti 1D NMR ( $^1\text{H}$ ,  $^{13}\text{C}$ , DEPT, NOE), 2D NMR (COSY, NOESY, HMBC and HSQC), UV, IR dan MS (GCMS, LCMS dan HRMS) serta perbandingan dengan data yang telah diterbitkan.

Tiga sebatian kimia telah diisolasikan daripada batang *Ochrosia oppositifolia*, satu alkaloid indola bernama isoreserpilina **1** dan dua asid ferulik ester bernama asid 2-propenoik, 3- (4-hidroksi- 3,5- dimetoksifenil)- metil ester E **73** dan 17- metoksi-karbonil- 14- heptadekaenil- 4- hidroksi- 3 metoksi sinamat F **74**.

Isolasi dan penulenan alkaloid daripada daun *Ochrosia oppositifolia* berjaya mendapatkan tiga alkaloid indola, bernama neisosposinin **2**, reserpinin **3** dan alkaloid D **72**.

Kesemua ekstrak dan sebatian- sebatian tulen diuji bagi aktiviti antiplasmodial, dan ekstrak heksana daripada batang telah menunjukkan aktiviti yang paling tinggi, dengan  $\text{IC}_{50}$  0.0505  $\mu\text{g/mL}$ . Antara alkaloid- alkaloid yang telah diuji, alkaloid D **72** merupakan sebatian yang paling tinggi aktiviti dengan  $\text{IC}_{50}$  0.0123  $\mu\text{mol L}^{-1}$ .