

องค์ประกอบทางเคมีของมะหาดและหาดหนู

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**CHEMICAL CONSTITUENTS OF  
*ARTOCARPUS LAKOOCHA* AND *A. GOMEZIANUS***

**Mr. Boonchoo Sritularak**

**A Thesis Submitted in Partial Fulfillment of the Requirements  
for the Degree of Master of Science in Pharmacy**

**Department of Pharmacognosy**

**Graduate School**

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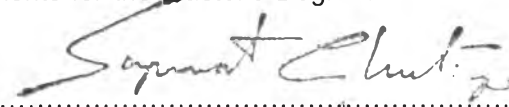
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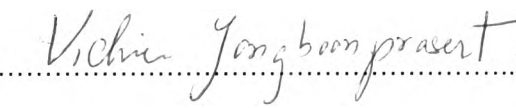
  
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พิมพ์ต้นฉบับบทความวิจัยวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

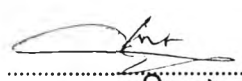
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การศึกษาพฤกษเคมีของแก่นมะหาด โดยใช้วิธีทางโครมาโทกราฟี สามารถแยกองค์ประกอบทางเคมีจากสิ่งสกัดได้สาร 2 ชนิดเป็นสารในกลุ่ม stilbene คือ oxyresveratrol และ resveratrol ส่วนการศึกษาพฤกษเคมีของรากหาดหนูน สามารถแยกองค์ประกอบทางเคมีจากสิ่งสกัดได้สาร 11 ชนิด ประกอบด้วยสารกลุ่ม flavonoid 6 ชนิด คือ isocyclomorusin, cycloartocarpin, artocarpin, norartocarpetin, cudraflavone C และ albanin A, สารกลุ่ม stilbene 1 ชนิด คือ resveratrol, สารกลุ่ม benzenoid 1 ชนิด คือ resorcinol, สารกลุ่ม naphthalene 1 ชนิด คือ Phenyl- $\beta$ -naphthylamine และพบสารกลุ่ม steroid ผสมกันคือ  $\beta$ -sitosterol และ stigmasterol การพิสูจน์โครงสร้างทางเคมีของสารประกอบที่แยกได้นี้ อาศัยการวิเคราะห์สเปกตรัมของ UV, IR, MS และ NMR ร่วมกับการเปรียบเทียบข้อมูลของสารที่ทราบโครงสร้างแล้ว ได้ทำการทดลองฤทธิ์ในการยับยั้งเอนไซม์ tyrosinase ของสารแต่ละชนิดพบว่า oxyresveratrol, resveratrol และ norartocarpetin มีฤทธิ์แรงที่สุด นอกจากนี้ยังได้อภิปรายความสัมพันธ์ระหว่างโครงสร้างและฤทธิ์ของสารเหล่านี้ด้วย

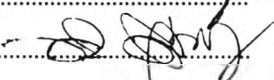
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ปีการศึกษา ..... 2541

ลายมือชื่อนิสิต 

ลายมือชื่ออาจารย์ที่ปรึกษา 

ลายมือชื่ออาจารย์ที่ปรึกษาร่วม 

พิมพ์ต้นฉบับบทความวิจัยวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

## 4076514033 : MAJOR PHARMACOGNOSY


KEY WORD: *ARTOCARPUS LAKOOCHA* / *A. GOMEZIANUS* / TYROSINASE INHIBITORS  
BOONCHOO SRITULARAK : CHEMICAL CONSTITUENTS OF *ARTOCARPUS LAKOOCHA* AND *A. GOMEZIANUS*. THESIS ADVISOR : ASSOCIATE PROFESSOR  
KITTISAK LIKHITWITAYAWUID, Ph.D., THESIS CO-ADVISOR : ASSOCIATE  
PROFESSOR WANCHAI DE-EKNAMKUL, Ph.D. 231 pp. ISBN 974-331-409-1.

Phytochemical study of the heartwood of *Artocarpus lakoocha* Roxb. led to the isolation of two stilbenes, namely oxyresveratrol and resveratrol. From the roots of *A. gomezianus* Wall. ex Tre'c. nine pure compounds were isolated. These compounds are the flavonoids isocyclomorusin, cycloartocarpin, artocatpin, norartocarpetin, cudraflavone C and albanin A. The others are the stilbene resveratrol, the benzenoid resorcinol and the naphthalene phenyl- $\beta$ -naphthylamine. In addition, the presence of  $\beta$ -sitosterol and stigmasterol was detected. The structures of all of these isolates were determined by extensive spectroscopic studies, including comparison of their UV, IR, MS and NMR properties with previously reported data. Each of these compounds was evaluated for its tyrosinase inhibitory activity. It was found that oxyresveratrol, resveratrol and norartocarpetin possessed the most potent activity. The structure-activity relationships of these compounds were also discussed.


ภาควิชา..... เกษษเวท

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ลายมือชื่อนิสิต..... 

ลายมือชื่ออาจารย์ที่ปรึกษา..... 

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## LIST OF ABBREVIATIONS

br	=	Broad (for NMR spectra)
C	=	Concentration
°C	=	Degree Celsius
CDCl <sub>3</sub>	=	Deuterated chloroform
CHCl <sub>3</sub>	=	Chloroform
cm	=	Centimeter
COLOC	=	Correlation spectroscopy via Long-range Coupling
<sup>13</sup> C NMR	=	Carbon-13 nuclear magnetic resonance
COSY	=	Correlation spectroscopy
1-D	=	One dimensional
2-D	=	Two dimensional
d	=	doublet (for NMR spectra)
dd	=	doublet of doublets (for NMR spectra)
ddd	=	doublet of doublets of doublets (for NMR spectra)
dddd	=	doublet of doublets of doublets of doublets (for NMR spectra)
DEPT	=	Distortionless Enhancement by Polarization Transfer
DMSO- <i>d</i> <sub>6</sub>	=	Deuterated dimethylsulfoxide
δ	=	Chemical shift
EIMS	=	Electron Impact Mass Spectrum
EtOAc	=	Ethyl acetate
g	=	Gram
μg	=	Microgram
HETCOR	=	Heteronuclear Chemical Shift Correlation
<sup>1</sup> H NMR	=	Proton nuclear magnetic resonance
HMBC	=	<sup>1</sup> H-detected Heteronuclear Multiple Bond Coherence
HMQC	=	<sup>1</sup> H-detected Heteronuclear Multiple Quantum Coherence
Hz	=	Hertz
IC <sub>50</sub>	=	Median inhibitory concentration
IR	=	Infrared spectrum
<i>J</i>	=	Coupling constant
Kg	=	Kilogram

L	=	Liter
L-DOPA	=	L-3,4-dihydroxyphenyl alanine
$\mu\text{l}$	=	Microliter
$\lambda_{\text{max}}$	=	Wavelength at maximal absorption
$\epsilon$	=	Molar absorptivity
$M^+$	=	Molecular ion
m	=	Multiplet (for NMR spectra)
MeOH	=	Methanol
mg	=	Milligram
MHz	=	Megahertz
min	=	Minute
ml	=	Millimeter
$m/z$	=	Mass to charge ratio
MS	=	Mass spectrometry
nm	=	Nanometer
NMR	=	Nuclear magnetic resonance
NOESY	=	Nuclear Overhauser Effect Correlation Spectroscopy
ppm	=	part per million
Pet. ether	=	Petroleum ether
$\nu_{\text{max}}$	=	Wave number at maximal absorption
s	=	Singlet (for NMR spectra)
t	=	Triplet (for NMR spectra)
TLC	=	Thin layer chromatography
UV	=	Ultraviolet