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สารแสดงฤทธิ์ทางชีวภาพของส่วนสกัดที่มีขี้จากลำต้นพะยุง



นาย สุระศักดิ์ ศรีสุขพลรักษ์

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BIOACTIVE COMPOUNDS OF THE POLAR EXTRACTS FROM THE STEMS OF
Dalbergia cochinchinensis



Mr. Surasak Seesukphronrarak

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By Mr. Surasak Seesukphronrarak
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Accepted by the faculty of Science, Chulalongkorn University in Partial
Fulfillment of the Requirements for the Master 's Degree



..... Deputy Dean for Administrative Affairs
(Associate Professor Pipat Karntiang, Ph. D.) Acting Dean, Faculty of Science

Thesis Committee :


.....Chairman
(Professor Udom Kokpol, Ph.D.)


.....Thesis Advisor
(Assistant Professor Santi Tip-pyang, Ph.D.)


.....Member
(Professor Padet Sidisunthorn, Ph.D.)


.....Member
(Assistant Professor Worawan Bhanthumnavin, Ph.D.)

**สุระศักดิ์ ศรีสุขพลรักษ์ : สารแสดงฤทธิ์ทางชีวภาพของส่วนสกัดที่มีขี้จากลำต้น
พะยุง (Bioactive compounds of the polar extracts from the stems of *Dalbergia
cochinchinensis*) อ. ทิปริญญา : ผศ. ดร. สันติ ทิพยางค์, 162 หน้า**

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การศึกษาองค์ประกอบทางเคมีและฤทธิ์ทางชีวภาพของส่วนสกัดเอทิลอะซิเตตจากลำต้น
พะยุง สามารถแยกสารใหม่ได้ 1 ชนิด คือ 5,7-dihydroxy-4'-methoxyisoflavonequinone (13)
และสารที่เคยพบแล้วอีก 12 ชนิด ได้แก่ genistein (1), calycosin (2), pratensein (3),
tectorigenin (4), formononetin (5), secundiflorol H (6), claussequinone (7), 5,7,3',5'-
tetrahydroxyflavanone (8), naringenin (9), liquiritigenin (10), soliquiritigenin (11) และ
bowdichione (12) สูตรโครงสร้างของสารชนิดใหม่สามารถหาได้ด้วยวิธีการทางสเปกโทรสโคปี
และ เปรียบเทียบข้อมูลกับสารที่เคยพบแล้วแบบเดียวกัน และยืนยันด้วย single crystal x-ray
diffraction

ในการทดสอบฤทธิ์ทางชีวภาพ ได้มีการทดสอบฤทธิ์ antioxidant ของสารที่แยกได้ด้วยวิธี
ต่างๆ อันได้แก่ ฤทธิ์ต้านอนุมูลอิสระ และ อนุมูล superoxide โดยเปรียบเทียบกับ BHA
(antioxidant ในทางการค้า) ผลการทดสอบฤทธิ์ทางชีวภาพของสารที่แยกได้พบว่า สาร 8 มีฤทธิ์
ต้านอนุมูลอิสระต่อ DPPH (IC_{50} 0.080 mM) สูงสุดของสารที่แยกได้ทั้งหมด ในขณะที่ สาร 2, 3
และ 6 มีฤทธิ์ต้านอนุมูลอิสระต่อ DPPH (IC_{50} 0.530, 0.620 และ 0.415 mM) ปานกลาง อย่างไรก็ตาม
ตาม สาร 3, 12 และ 13 ยังแสดงฤทธิ์ยับยั้ง superoxide anion radical (IC_{50} 8.00, 1.55 และ
1.40 μ M) สูงกว่า BHA (IC_{50} 9.50 μ M) นอกจากนี้ สาร 5 และ 11 ยังแสดงความเป็นพิษปาน
กลางต่อ KB cell lines (IC_{50} 9 และ 8 μ g / ml)

ภาควิชา.....เคมี.....
สาขาวิชา.....เคมี.....
ปีการศึกษา.....2544.....

ลายมือชื่อนิสิต.....
ลายมือชื่ออาจารย์ที่ปรึกษา.....
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

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The investigation for chemical constituents and their biological activity from crude ethyl acetate extract of *Dalbergia cochinchinensis* led to the isolation of one new compound, 5,7-dihydroxy-4'-methoxyisoflavonequinone (13), as well as twelve known compounds, genistein (1), calycosin (2), pratensein (3), tectorigenin (4), formononetin (5), secundiflorol H (6), claussequinone (7), 5,7,3',5'-tetrahydroxyflavanone (8), naringenin (9), liquiritigenin (10), isoliquiritigenin (11) and bowdichione (12). The structure of the new compound was determined by spectroscopic method, comparison the data with the same type of known compounds, and confirmed by single crystal x-ray diffraction.

In biological activity, the isolated compounds were evaluated by various antioxidant assays, including free radicals and superoxide anion radical scavenging activities by comparison with BHA (commercial antioxidant). The biological activity results indicated that compound 8 showed highest free radical scavenging activity on DPPH (IC_{50} 0.080 mM) among the isolated compounds while compound 2, 3 and 6 showed moderate activity (IC_{50} 0.530, 0.620 and 0.415 mM). However, compound 3, 12 and 13 showed more potent superoxide anion radical scavenging activity (IC_{50} 8.00, 1.55 and 1.40 μ M) than BHA (IC_{50} 9.50 μ M). In addition, compound 5 and 11 also showed moderate in vitro cytotoxicity against KB cell lines (IC_{50} 9 and 8 μ g / ml)

Department.....ChemistryStudent's signature.....

Field of study.....Chemistry.....Advisor's signature.....

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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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List of Abbreviations

CC, SiO ₂	= column chromatography using silica gel as absorbent
TLC	= thin layer chromatography
R _f	= retardation factor
m.p.	= melting point
°C	= degree celsius
w/w	= weight by weight
g	= gram
Kg	= kilogram
mg	= milligram
µg	= microgram
ml	= millilitre
nm	= nanometre
mM	= millimolar
UV	= ultra-violet
EIMS	= electron impact mass spectrometry
m/z	= mass per charge
MW	= molecular weight
IR	= infrared
ν _{max}	= wave number cause maximum absorption
FT	= fourier transform
NMR	= nuclear magnetic resonance
DMSO	= dimethylsulfoxide
CDCl ₃	= deuterated chloroform
CD ₃ OD	= deuterated methanol
δ	= chemical shift
J	= coupling constant
Hz	= hertz
s	= singlet
d	= doublet

dd	= doublet of doublet
t	= triplet
q	= quartet
m	= multiplet
DEPT	= distortionless enhancement by polarization transfer
NOE DIFF	= nuclear overhauser effect difference
ppm	= parts per million (or $\mu\text{g/ml}$)
OMe	= methoxy
OH	= hydroxy
DPPH	= 2,2-diphenyl-1-picrylhydrazyl radical
DPPHn	= 2,2-diphenyl-1-picrylhydrazine
BHA	= butylated hydroxyanisole
XO	= xanthine oxidase



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