องค์ประกอบทางเคมีจากลำต้นเถาช้างและฤทธิ์ทางชีวภาพ

นางสาว ปิยนุช ทองผาสุก

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CHEMICAL CONSTITUENTS FROM *STRYCHNOS VANPRUKII* STEM AND THEIR BIOLOGICAL ACTIVITIES

Miss Piyanuch Thongphasuk

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จากการศึกษาทางพฤกษเคมีของลำต้นเถาช้าง พบสารไดเทอร์ปีนชนิดใหม่ในกลุ่มของไอโสพิมาเรน คือ 7β–hydroxy-isopimara-8,15-dien-14-one และสารกลูโคแอลคาลอยด์ชนิดใหม่ 1 ชนิด คือ 3,4-dehydropalicoside พร้อมทั้งสารแอลคาลอยด์อีก 5 ชนิด คือ palicoside, 3,4,5,6-tetradehydropalicoside, akagerine, 17-*O*-methylakagerine และ strychnocarpine, นอกจากนี้ยังพบสารในกลุ่มลิกแนน 3 ชนิดใหม่ 2 ชนิด คือ strychnoside และ vanprukoside และที่เคยมีรายงานแล้ว คือ lyoniresinol 3-*O*-β-glucopyranoside สารกลุ่มฟีนอลิก 3 ชนิด คือ pyrocatechuic glucopyranoside, syringic acid และ vanillic acid สารในกลุ่ม cyclitol คือ bornesitol สารผสมของ β-sitosterol กับ stigmasterol และ สารผสมกลัยโคไซด์ของสารดังกล่าว สารในกลุ่มลิกแนน 3 ชนิดแสดงฤทธิ์ต้านอนุมูลอิสระได้ดีกว่า ascorbic acid และสารทดสอบทั้งหมดแสดงฤทธิ์ยับยั้งเอนไซม์ acetylcholinesterase ได้น้อยกว่า galanthamine และไม่มีฤทธิ์ต้านจุลชีพต่อเชื้อทดสอบและฤทธิ์ความเป็นพิษต่อเซลล์ melanoma B16

สาขาวิชา เภสัชเคมีและผลิตภัณฑ์ธรรมชาติ
ปีการศึกษา 2545

ลายมือชื่อนิสิต.....ปิยนุช ทองผาสุก.....
ลายมือชื่ออาจารย์ที่ปรึกษา.....รพีพล ภโววาท.....
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....รุทธ์ สุทธิศรี.....

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PIYANUCH THONGPHASUK: CHEMICAL CONSTITUENTS FROM *STRYCHNOS VANPRUKII* STEM AND THEIR BIOLOGICAL ACTIVITIES. THESIS ADVISOR : ASSOCIATE PROFESSOR RAPEPOL BAVOVADA, Ph.D, THESIS CO-ADVISOR : ASST. PROF. RUTT SUTTISRI, Ph.D, 278 pp.
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Phytochemical study of the stem of *Strychnos vanprukii* Craib yielded a new isopimarane diterpenoid, 7β–hydroxyisopimara-8,15-dien-14-one, and a new gluco-indole alkaloid, 3,4-dehydropalicoside, together with five other alkaloids: palicoside, 3,4,5,6-tetradehydropalicoside, akagerine, 17-*O*-methylakagerine and strychnocarpine. Two new lignans, strychnoside and vanprukoside, were also isolated together with the known lyoniresinol-3-*O*-β-glucopyranoside. Three phenolic compounds: pyrocatechuic glucoside, syringic and vanillic acid, a cyclitol compound (bornesitol), mixture of β-sitosterol and stigmasterol and mixture of their glucosides were also found. Three lignans displayed antioxidant activity more active than ascorbic acid. All of the tested compounds showed acetylcholinesterase inhibitory activity less active than galanthamine and possessed no antimicrobial activity against tested microorganisms and cytotoxic activity against melanoma B16 cell line.

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Field of study Pharmaceutical Chemistry and Natural Products Advisor's signature..Rapepol Bavovada

Academic year 2002 Co-advisor's signature.....Rutt Suttisri

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LIST OF SCHEMES

LIST OF ABBREVIATIONS

ε	= Molar absorptivity
ν_{max}	= Wave number at maximal absorption
λ_{max}	= Wavelength at maximal absorption
^{0}C	= Degree Celsius
^{13}C-NMR	= Carbon-13 nuclear magnetic resonance
1D	= One dimensional
^{1}H-NMR	= Proton nuclear magnetic resonance
2D	= Two dimensional
AchE	= Acetylcholinesterase
APT	= Attached Proton Test
ATCI	= Acetylthiocholine Iodide
br	= broad (for NMR spectra)
CD_3OD	= Deuterated methanol
$CDCl_3$	= Deuterated chloroform
$CHCl_3$	= Chloroform
cm	= Centimeter
COLOC	= Correlation spectroscopy via Long-range Coupling
COSY	= Correlation spectroscopy
d	= doublet (for NMR spectra)
dd	= doublet of doublets (for NMR spectra)
DEPT	= Distortionless Enhancement by Polarization Transfer
DMSO-d_6	= Deuterated dimethyl sulfoxide
DPPH	= 2,2-diphenyl-1-picrylhydrazyl
DTNB	= 5, 5′-dithiobis-[2-nitrobenzoic acid]
EIMS	= Electron Impact Mass Spectrum
ESMS	= Electron spray ionization Mass Spectrum
EtOAc	= Ethyl acetate
g	= Gram
HETCOR	= Heteronuclear Chemical Shift Correlation
HMBC	= Proton detected Heteronuclear Multiple Bond Coherence

LIST OF ABBREVIATIONS (continued)

HMQC	= ^{1}H-detected Heteronuclear Multiple Quantum Coherence
Hz	= Hertz
IR	= Infrared spectrum
J	= Coupling Constant
KBr	= Potassium Bromide
Kg	= Kilogram
L	= Liter
m	= multiplet (for NMR spectra)
m.p.	= Melting Point
m/z	= Mass to Charge Ratio
M^{+}	= Molecular ion
MeOH	= Methanol
mg	= Milligram
MHz	= Megahertz
min	= minute
ml	= Millimeter
mm	= Millimeter
MS	= Mass Spectrometry
nm	= Nanometer
NMR	= Nuclear Magnetic Resonance
NOESY	= Nuclear Overhauser Effect spectroscopy
PBS	= Phosphate Buffer Saline
ppm	= part per million
s	= Singlet (for NMR spectra)
ssp.	= Species
t	= Triplet (for NMR spectra)
TLC	= Thin Layer Chromatography
UV	= Ultraviolet
δ	= Chemical shift
µl	= Microliter