

องค์ประกอบทางเคมีจากลำต้นกิ่งคาเดียด

(*Arfeuillea arborescens* Pierre ` และฤทธิ์ทางชีวภาพ

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CHEMICAL CONSTITUENTS FROM THE STEMS OF *Arfeuillea*
arborescens Pierre AND THEIR BIOLOGICAL ACTIVITY

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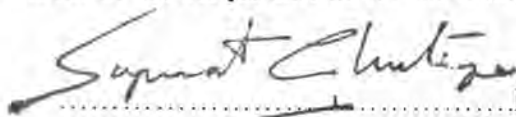
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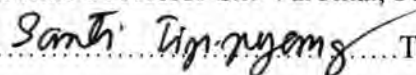
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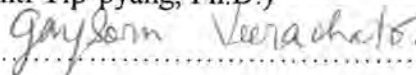
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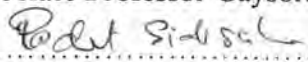
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ปรีชา ภู่วไพริสรีสาธ : องค์ประกอบทางเคมีจากลำต้นคองคาเคียด *Arfeuillea arborescens* Pierre และฤทธิ์ทางชีวภาพ (CHEMICAL CONSTITUENTS FROM THE STEMS OF *Arfeuillea arborescens* Pierre AND THEIR BIOLOGICAL ACTIVITY) อาจารย์ที่ปรึกษา : อ. ดร. ตันติพิทยางค์, อาจารย์ที่ปรึกษาร่วม : รศ. เกษร วีระชาโต, 95 หน้า. ISBN 974-639-340-5.

การศึกษาองค์ประกอบทางเคมีจากลำต้นคองคาเคียด (*Arfeuillea arborescens* Pierre) สามารถแยกได้ของผสม 3 ชนิด และสารบริสุทธิ์ อีก 7 ชนิด จากผลสกัดเฮกเซน, ไดคลอโรมีเทน และ เอทิลอะซิเตท ได้แก่ ของผสมไฮโดรคาร์บอนโซ่ตรง(C₁₈, C₂₁, C₂₅-C₃₀, C₃₂-C₃₄), ของผสม stigmasterol กับ β -sitosterol, ของผสมเอสเทอร์โซ่ตรง, (+)-proto-quercitol, 3,5-Bis-[3,3-dimethylallyl]-p-hydroxybenzaldehyde, cyclic tris(ethylene terephthalate), stigmasteryl-3-O- β -D-glucopyranoside, scopoletin, 5-hydroxymethylfurfuraldehyde และ p-hydroxybenzoic acid ซึ่งสาร 2 ชนิดหลังแสดงความเป็นพิษต่อไบรินซ์ซิมพ์ (*Artemia salina* Linn) ด้วยค่า LC₅₀ 71.0 และ 33.1 ไมโครกรัม/มิลลิลิตร สำหรับ 5-hydroxymethylfurfuraldehyde ยังมีฤทธิ์ต้านเชื้อแบคทีเรีย 7 ชนิดคือ *E. coli*, *B. cereus*, *S. aureus*, *S. derby*, *E. coli* 0157: H7, *L. monocytogenes* และ กลุ่มเชื้อจุลินทรีย์ที่ทำให้อาหารเน่าเสีย (flat sour spoilage) อย่างมีนัยสำคัญรวมทั้งเชื้อรา *Cladosporium cucumerinum* อีกทั้งยังยับยั้งการเจริญเติบโตของข้าวพันธุ กข.23 และยังมีฤทธิ์เป็น antioxidant ด้วย

ภาควิชา เคมี
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ลายมือชื่อนิสิต ปรีชา ภู่วไพริสรีสาธ.
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Arfeuillea arborescens Pierre / CHEMICAL CONSTITUENT / BIOLOGICAL ACTIVITYPREECHA PHUWAPRAIRISAN : CHEMICAL CONSTITUENTS FROM THE STEMS OF *Arfeuillea arborescens* Pierre AND THEIR BIOLOGICAL ACTIVITY. THESIS ADVISOR : SANTI TIP-PYANG, Ph.D. THESIS COADVISOR : ASSOC. PROF. GAYSORN VEERACHATO, M.Sc. 95 pp. ISBN 974-639-340-5.

A chemical investigation of the stems of *Arfeuillea arborescens* Pierre, three mixtures and seven compounds were isolated from hexane, dichloromethane and ethyl acetate crude extracts. They were a mixture of long chain aliphatic hydrocarbons (C_{18} , C_{21} , C_{25} - C_{30} , C_{32} - C_{34}), a mixture of stigmasterol and β -sitosterol, a mixture of long chain aliphatic esters, (+)-*proto*-quercitol, 3,5-Bis-[3,3-dimethylallyl]-*p*-hydroxybenzaldehyde, cyclic tris(ethylene terephthalate), stigmasteryl-3-O- β -D-glucopyranoside, scopoletin, 5-hydroxymethylfurfuraldehyde and *p*-hydroxybenzoic acid. The last two compounds showed cytotoxicity against *Artemia salina* Linn (brine shrimp) with LC_{50} 71.0 and 33.1 μ g/ml. In addition, 5-hydroxymethylfurfuraldehyde showed significant antibacterial activity against 7 microorganisms: *E. coli*, *B. cereus*, *S. aureus*, *S. derby*, *E. coli* 0157: H7, *L. monocytogenes* and flat sour spoilage as well as antifungal activity against *Cladosporium cucumerinum*. This compound also showed plant growth inhibition against *Oryza sativa* Linn. var. RD.23 as well as antioxidant.

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List of Abbreviations

PTLC	= preparative thin layer chromatography
CC, SiO ₂	= column chromatography using silica gel as absorbent
TLC	= thin layer chromatography
R _f	= retention factor
m.p.	= melting point
°C	= degree celsius
dec.	= decompose
w/w	= weight by weight
g	= gram
Kg	= kilogram
mg	= milligram
ml	= milliliter
UV	= ultra-violet
EIMS	= electron impact mass spectrometry
m/z	= mass per charge
M.W.	= molecular weight
IR	= infrared
ν_{\max}	= wave number cause maximum absorption
FID	= flame ionization detector
GC	= gas chromatography
FT	= fourier transform
NMR	= nuclear magnetic resonance
TMS	= tetramethyl silane
DMSO	= dimethylsulfoxide
δ	= chemical shift
J	= coupling constant
Hz	= Hertz
s	= singlet

d	= doublet
t	= triplet
q	= quartet
quint	= quintet
m	= multiplet
DEPT	= distortionless enhancement by polarization transfer
HMQC	= ¹ H-detected heteronuclear multiple-quantum coherence <i>via</i> direct coupling
HMBC	= heteronuclear multiple bond connectivity by 2D multiple quantum NMR
COSY	= two-dimensional ¹ H correlation Spectroscopy
INEPT	= insensitive nuclei enhanced by polarization transfer
NOE	= nuclear overhauser effect
ppm	= part per million (or μg/ml)
LC ₅₀	= lethal concentration (concentration caused 50% lethality)
Ara	= α-L-arabinose
Rha	= α-L-rhamnose (6-deoxymannose)
Xyl	= β-D-glucose
Glc	= β-D-glucose
Ac	= acetyl