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LIST OF ABBREVIATIONS

A549	Adenocarcinomic Human Alveolar Basal Epithelial Cells
ASK	Rat Glioma Cell
BC	Breast Cancer Cell Line
BEL-7402	Hepatocellular Carcinoma Cell Line
BHY	Oral Squamous Carcinoma Cell Line
bk	Bark
BKF	Bangkok Forest
^{13}C NMR	Carbon Nuclear Magnetic Resonance
Caov-3	Ovarian Cancer Cell Line
CC	Column Chromatography
CCRF-CEM	Drug-Sensitive Leukemia Cell Line
CDCl_3	Chloroform-d
CD_3OD	Methanol-d ₄
CEM/ADR5000	Multidrug-Resistant P-Glycoprotein Over-Expressing Leukemia Cell Line
CEM-SS	Human CD4^+ T Cell Leukemia Cell Line
CHCl_3	Chloroform
CH_2Cl_2	Dichloromethane/Methylene Chloride
cm	Centimeter
cm^{-1}	Reciprocal Wavelength
Col-2	Colon Cancer Cell Line
COSY	Correlation Spectroscopy
1D NMR	One Dimensional Nuclear Magnetic Resonance
2D NMR	Two Dimensional Nuclear Magnetic Resonance
<i>d</i>	Doublet Splitting Pattern
DEPT	Distortionless Enhancement by Polarization Transfer
<i>dd</i>	Doublet of Doublet Splitting Pattern
$\text{DMSO}-d_6$	Dimethyl Sulfoxide-d ₆

<i>dt</i>	Doublet of Triplet Splitting Pattern
ED ₅₀	50% Effective Dose
EIMS	Electron Ionization Mass Spectrometry
EtOAc	Ethyl Acetate
EtOH	Ethanol
eV	Electron Volt
f	Flower
F	Fraction
Fig.	Figure
FTIR	Fourier Transform Infrared Spectroscopy
g	Gram
GE Healthcare	General Electric Healthcare
¹ H NMR	Proton Nuclear Magnetic Resonance
h.	Hours
HEK-293	Human Embryonic Kidney
Hela	Cervical Cancer Cell Line
HGC-27	Gastric Cancer Cell Line
HIV-1 RT	Antihuman Immunodeficiency Virus-1 Reverse Transcriptase
HL-60	Human Promyelocytic Leukemia Cell Line
HMBC	Heteronuclear Multiple Bond Correlation
HMQC	Heteronuclear Multiple Quantum Correlation
HSV type-1	Antih herpes Simple Virus Type-1
HT29	Human Colon Carcinoma
Hz	Hertz
IR	Infrared Spectroscopy
<i>J</i>	Coupling Constant (frequency unit, Hz)
Jurkat	T Cell Leukemia Cell Line
KB	Human Oral Epidermoid Carcinoma
KBr	Potassium Bromide
kg	Kilogram
l	Leaves
L	Liter

Lit.	Literature
Lu-1	Lung Cancer Cell Line
<i>m</i>	Multiplet Splitting Pattern
M	Meter
MCF-7	Human Breast Cancer
MDA-MB-231	Breast Cancer Cell Line
MeOH	Methanol
mg	Milligram
MHz	Megahertz
mL	Milliliter
mm	Millimeter
MOLT-3	Acute Lymphoblastic Leukemia Cell Line
mp	Melting Point
<i>mult</i>	Multiplicity
nm	Nanometer
NMR	Nuclear Magnetic Resonance
OD	Optical Density
P-388	Murine Lymphocytic Leukemia
PI type-3	Anti-Parainfluenza Type-3
ppm	Parts per Million
PLC	Preparative Thin Layer Chromatography
rt	Root
rw	Root Wood
<i>s</i>	Singlet Splitting Pattern
sb	Stem Bark
sd	Seed
SI	Selectivity Index
SPC-A-1	Human Lung Cancer
SRB	Sulforhodamine B
st	Stem
<i>t</i>	Triplet Splitting Pattern
T47D	Breast Cancer Cell Line

tb	Trunk Bark
TLC	Thin Layer Chromatography
TMS	Tetramethylsilane
UV	Ultraviolet
var.	Variety
w	Wood
786-0	Kidney Cancer Cell Line



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LIST OF SYMBOLS

α	Alpha, Configuration at the Anomeric Center
β	Beta, Configuration at the Anomeric Center
δ	Delta, Chemical Shift (ppm)
$^{\circ}\text{C}$	Degree Celsius, Temperature on the Celsius Scale
γ	Gamma, Prefix of the 5-Membered Ring
λ	Lambda, Wavelength of Absorption
m/z	Mass to Charge Ratio, Physical Quantity of Mass Spectrometry
μ	Micro, Unit Prefix (One Millionth, 10^{-6})
$\text{M}^{\bullet}$	Molecular Ion, Single Unpaired Electron

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ข้อความแห่งการริเริ่ม

วิทยานิพนธ์นี้ได้นำเสนอการศึกษาองค์ประกอบทางเคมีและฤทธิ์ทางชีวภาพจากสมุนไพรไทย ต้นคำหอมและต้นหลังโก่ง พืชทั้งสองชนิดนี้จะผ่านกระบวนการสกัดหยาบ การแยก การทำให้สารบริสุทธิ์ การตกผลึก และการอธิบายโครงสร้างของสาร โดยโครงสร้างจะได้รับการพิสูจน์จากสเปกตรัมและข้อมูลทางกายภาพของสารที่ได้ ข้อมูลจากเทคนิคทางสเปกโตรสโกปีต่างๆ โดยเฉพาะอย่างยิ่งข้อมูลที่ได้จากนิวเคลียร์แมกเนติกเรโซแนนซ์ อินฟราเรด และ แมสสเปกโตรสโกปีนั้น มีความสำคัญต่อการหาโครงสร้างโมเลกุลของสารประกอบที่ถูกต้อง สารสกัดหยาบและสารบริสุทธิ์ที่แยกได้จากพืชทั้งสองชนิดนี้ยังได้รับการทดสอบฤทธิ์ทางชีวภาพอีกด้วย สำหรับผลการศึกษาครั้งนี้ นับเป็นครั้งแรกที่มีการรายงานผลการศึกษายาองค์ประกอบของสารพฤษเคมีจากต้นคำหอม และเป็นครั้งแรกของการรายงานผลการศึกษาฤทธิ์ทางชีวภาพของสารประกอบที่แยกได้จากต้นหลังโก่งอีกด้วย

ตามที่ข้าพเจ้าทราบมา นี่คือการรับรองว่าเนื้อหาในวิทยานิพนธ์นี้เป็นงานของข้าพเจ้า ซึ่งมีได้ถูกเผยแพร่หรือนำเสนอเพื่อปริญาหรือประกาศนียบัตรอื่นใดในสถาบันการศึกษาใดๆทั้งสิ้น เว้นแต่ในส่วนที่มีการอ้างอิงและให้การยอมรับอย่างเหมาะสม

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STATEMENTS OF ORIGINALITY

In this thesis presented the investigation of the chemical constituents and biological activities from Thai medicinal plant of *P. evecata* var. *attopeuensis* and *P. bullata*. These plants have been carried out by extraction, separation, purification, crystallization and structure explanation. The structures have been established on the basis of spectral and physical evidence. It is worth to note that the data from spectroscopic techniques, especially the NMR, IR and MS have also been performed on the accurate molecular structure. The extracts and pure compounds have been submitted for biological evaluation by using the standard *in vitro* sulforhodamine B assay. The findings from this research will be the first reports of phytochemical constituents of *P. evecata* var. *attopeuensis* and biological activities of the isolated compounds from *P. bullata*.

This is to certify that, to the best of my knowledge, the content of this thesis is my own work which it has not published or submitted for any other degree or diploma at any educational institution, except where appropriately referenced and acknowledged in the text.

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