

คูมารินจากรากมะสัง *Feroniella lucida* และฤทธิ์ต้านการเกาะกลุ่มของเกร็ดเลือด



นายเสริม สุรพินิจ

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COUMARINS FROM THE ROOTS OF *Feroniella lucida* AND THEIR ANTIPLATELET ACTIVITIES

Mr. Serm Surapinit

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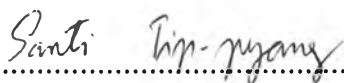


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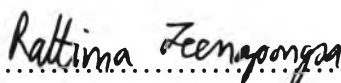
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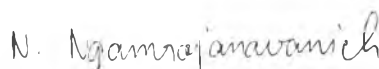
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เสริม สุรพินิจ: คูมารินจากรากมะสัง *Feroniella lucida* และฤทธิ์ต้านการเกาะกลุ่มของเกร็ดเลือด (COUMARINS FROM THE ROOTS OF *Feroniella lucida* and THEIR ANTIPLATELET ACTIVITIES) อ. ที่ปรึกษา: รศ. ดร. สันติ ทิพยางค์, อ.ที่ปรึกษาร่วม: ผศ.ดร. ภญ. รัตติมา จีนาพวงษา ผศ.ดร. ปรีชา ภูวไพโรศิริศาล 50 หน้า. ISBN 974-53-2768-9.

จากการแยกสกัดสารจากสมุนไพรไทยในวงศ์ Rutaceae โดยสกัดแยกสารจากสิ่งสกัดไดคลอโรมีเทนจากส่วนรากมะสัง ได้สารจำนวน 10 ชนิด โดยเป็นคูมารินชนิดใหม่ได้ 3 ชนิด ได้แก่ feroniellin A (7), feroniellin B (11) และ feroniellin C (9) คูมารินที่มีรายงานมาก่อน อีก 8 ชนิด ได้แก่ anisolactone (1), 2'', 3''-epoxyanisolactone (2), psoralen (3), bergapten (4), isopimpinellin (5), marmesin (6), oxypeucedanin hydrate (8) และ 2'', 3''-dihydroxyanisolactone (10) ซึ่งโครงสร้างของสารที่แยกได้หาได้จากข้อมูลทางสเปกโทรสโกปีและการเปรียบเทียบกับรายงานที่มีมาก่อนหน้านี้ หลังจากนั้นนำสารบริสุทธิ์ที่ได้มาทดสอบฤทธิ์ในการต้านการเกาะกลุ่มของเกร็ดเลือด โดยใช้ ADP เป็นตัวเหนี่ยวนำ พบว่า feroniellin B มีฤทธิ์ในการยับยั้งการเกาะกลุ่มของเกร็ดเลือดได้ นอกจากนี้ยังพบว่า feroniellin B ($IC_{50} = 0.287 \text{ mM}$) ให้ผลการยับยั้งการเกาะกลุ่มของเกร็ดเลือดได้ดีกว่า ibuprofen ($IC_{50} = 11.2 \text{ mM}$) ซึ่งเป็นสารมาตรฐาน ถึง 39 เท่า

สาขาวิชา.....เทคโนโลยีชีวภาพ.....ลายมือชื่อนิสิต.....**เสริม สุรพินิจ**
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SERM SURAPINIT: COUMARINS FROM THE ROOTS OF *Feroniella lucida* AND THEIR ANTIPLATELET ACTIVITIES. THESIS ADVISOR: ASSO. PROF. Dr. SANTI TIP-PYANG, THESIS CO-ADVISOR: ASST. PROF. Dr. RATTIMA JEENAPONGSA, ASST. PROF. Dr. PREECHA PHUWAPRAISIRISAL 50 pp. ISBN 974-53-2768-9.

In phytochemical investigation of coumarins from Thai medicinal plant in the family Rutaceae, dichloromethane crude extract from the roots of *Feroniella lucida* was selected for separation, purification, structural elucidation and evaluation for anti-platelet aggregation. The chromatographic of dichloromethane crude extract led to the isolation of three new furanocoumarins, feroniellin A (7), feroniellin B (11) and feroniellin C (9), along with eight known furanocoumarins, anisolactone (1), 2", 3"-epoxyanisolactone (2) psoralen (3), bergapten (4), isopimpinellin (5), marmesin (6), oxypeucedanin hydrate (8), and 2", 3"-dihydroxyanisolactone (10). The structures of all isolated compounds were established on the basis of spectroscopic data and compared to literatures. All isolated furanocoumarins were further evaluated for anti-platelet aggregation. The results showed that feroniellin B was only one compound among the isolated furanocoumarins that inhibited ADP-induced platelet aggregation. Importantly, feroniellin B ($IC_{50} = 0.287$ mM) was thirty-nine times more potent than ibuprofen ($IC_{50} = 11.2$ mM), positive control.

Field of study.....Biotechnology.....Student's signature.....*Serm Surapinit*.....

Academic year.....2005.....Advisor's signature.....*Santi Tip-pyang*.....

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List of Abbreviations

°C	Degree Celsius
¹³C-NMR	Carbon-13 nuclear magnetic resonance
¹H-NMR	Proton nuclear magnetic resonance
ADP	Adenine diphosphate
brd	Broad doublet
brm	Broad multiplex
brs	Broad singlet
CaCl₂	Calcium chloride
cAMP	Cyclic adenine monophosphate
CDCl₃	Deuterated chloroform
CH₂Cl₂	Dichloromethane
COSY	Correlated spectroscopy
d	Doublet
dd	Doublet of doublet
DMSO	Dimethyl sulfoxide
EtOAc	Ethyl acetate
g	Gram
GPIba	Glycoprotein Iba
GPVI	Glycoprotein IV
Hex	Hexane
HMBC	Heteronuclear multiple bond connectivity
HMQC	Heteronuclear multiple-quantum coherence
HPLC	High performance liquid chromatography
HRESIMS	High resolution electrospray ionisation mass spectrum
Hz	Hertz
IC₅₀	Median inhibitory concentration
<i>J</i>	Coupling constant
m	Multiplex
<i>m/z</i>	Mass per charge
MeOH	Methanol
mg	Milligram
MHz	Megahertz

List of Abbreviations (continued)

mL	Milliliter
μM	Micromolar
mM	Millimolar
N.A.	Not active
nm	Nanometer
NOESY	Nuclear overhauser effect spectroscopy
ppm	Part per million
PPP	Platelet-poor plasma
PRP	Platelet-rich Plasma
q	Quartet
s	Singlet
t	Triplet
TxA2	Thromboxane A2
vWF	von Willebrand Factor
δ	Chemical shift
λ_{max}	Maximum Wavelength