

สารบัญยังการเติบโตของวัชพืชจากกะเพราผี (*Hyptis suaveolens* Poit.)



นาย ชูติโชติ มั่งมี

ศูนย์วิทยทรัพยากร

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

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WEED GROWTH INHIBITOR FROM *Hyptis suaveolens* Piot.



Mr.Chutichot Mungmee

A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Science in Biotechnology

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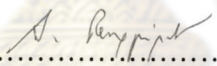
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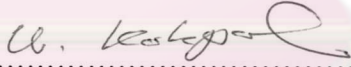
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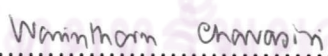
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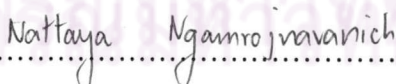

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ชุตติโชติ มั่งมี : สารยับยั้งการเติบโตของวัชพืชจากกะเพราผี (*Hyptis suaveolens* Poit.). (WEED GROWTH INHIBITOR FROM *Hyptis suaveolens* Poit.) อ. ที่ปรึกษา : ศาสตราจารย์ ดร.อุดม กักผล, อ.ที่ปรึกษาร่วม : ผู้ช่วยศาสตราจารย์ ดร.วรินทร์ ขวศิริ 123 หน้า. ISBN 974-17-1261-8.

จากการเสาะหาสารเคมีทางการเกษตรจากกะเพราผี วัชพืชในวงศ์ Labiatae สามารถแยกสารได้ 13 ชนิด สาร 8 ชนิดแยกจากสิ่งสกัดไดคลอโรมีเทน คือ ของผสมของสเตียรอยด์ (HS-1), oleanolic acid (HS-2), 4',5-dihydroxy-7-methoxy flavone (HS-3), 5-hydroxy methyl furfuraldehyde (HS-4), ของผสมของสเตียรอยด์ ไกลโคไซด์ (HS-5), ของผสมไตรเทอร์ปีนอยด์ (HS-6), ของผสมแอลกอฮอล์ไซตรง (HS-7), ของผสมเอสเทอร์ไซตรง (HS-8) สารอีก 5 ชนิดแยกจากสิ่งสกัดเฮกเซน คือ β -amyrin (HS-9), α -amyrin (HS-10), lupeol (HS-11), betulinic acid (HS-12) และ ursolic acid (HS-13) ไม่เคยมีรายงานว่าพบสาร 4',5-dihydroxy-7-methoxy flavone (HS-3) และ 5-hydroxy methyl furfuraldehyde (HS-4) ในพืชชนิดนี้มาก่อน จากการศึกษาฤทธิ์ในการยับยั้งการเติบโตต้นกล้าของหญ้าข้าวนก (*Echinochloa crus-galli* Beauv.) พบว่าสาร 5-hydroxy methyl furfuraldehyde (HS-4) สามารถยับยั้งการเติบโตส่วนรากได้ดีที่สุด คือ 82 เปอร์เซ็นต์ ตามมาด้วย betulinic acid (HS-12) 52 เปอร์เซ็นต์ และ 4',5-dihydroxy-7-methoxy flavone (HS-3) 45 เปอร์เซ็นต์ ที่ความเข้มข้น 1000 ส่วนในล้านส่วน นอกจากนี้ยังได้ศึกษาฤทธิ์ในการยับยั้งการเติบโตของต้นกล้าผักกาดหอม (*Lactuca sativa* Linn.), ผักเบี้ยหิน (*Trianthema portulacastrum* Linn.), ก้นจ้ำขาว (*Bidens pilosa* Linn.), ผักกาดขาว (*Brassica chinense* Jusl.), หญ้าปากควาย (*Dactyloctenium aegyptium* Willd.) และ หญ้าขจรจบดอกใหญ่ (*Pennisetum polystachyon* Schult.) พบว่า 5-hydroxy methyl furfuraldehyde (HS-4) สามารถยับยั้งการเติบโตส่วนรากของพืชทุกชนิดได้

หลักสูตร.....เทคโนโลยีชีวภาพ.....
สาขาวิชา.....เทคโนโลยีชีวภาพ.....
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ลายมือชื่อนิสิต.....
ลายมือชื่ออาจารย์ที่ปรึกษา.....
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KEY WORD: *Hyptis suaveolens* Poit. / ALLELOCHEMICAL / PLANT GROWTH INHIBITOR /

CHUTICHOT MUNG MEE : WEED GROWTH INHIBITOR FROM *Hyptis suaveolens*
Piot.. THESIS ADVISOR : PROF.UDOM KOKPOL, Ph.D., THESIS CO-ADVISOR :
ASSIST. PROF. WARINTHORN CHAVASIRI, Ph.D., 123 pp. ISBN 974-17-1261-8.

A search for agrochemicals from *Hyptis suaveolens* Poit., a weed in the family Labiatae, led to the isolation of thirteen substances. Eight substances isolated from crude dichloromethane extract included a mixture of two steroids (HS-1), oleanolic acid (HS-2), 4',5-dihydroxy-7-methoxy flavone (HS-3), 5-hydroxy methyl furfuraldehyde (HS-4), a mixture of two steroids glycoside (HS-5), a mixture of two triterpenoids (HS-6), mixture of long chain alcohols (HS-7) and a mixture of long chain esters (HS-8). While five additional compounds, namely, β -amyrin (HS-9), α -amyrin (HS-10), lupeol (HS-11), betulinic acid (HS-12) and ursolic acid (HS-13) were isolated from crude hexane extract. 4',5-Dihydroxy-7-methoxy flavone (HS-3), and 5-hydroxy methyl furfuraldehyde (HS-4) had not been reported as constituents of this plant. In the study of plant growth inhibitory activity against seedling *Echinochloa crus-galli* Beauv., it was found that 5-hydroxy methyl furfuraldehyde (HS-4) showed the highest inhibitory activity at 82 % at 1000 ppm, followed by betulinic acid (HS-12) and 4',5-dihydroxy-7-methoxy flavone (HS-3), which gave 52% and 45% inhibitory activities, respectively. Furthermore, seedling growth inhibitory effect against selected seedling plants: *Lactuca sativa* Linn., *Trianthema portulacastrum* Linn., *Bidens pilosa* Linn., *Brassica chinese* Just., *Dactyloctenium aegyptium* Willd. and *Pennisetum polystachyon* Schult. were also investigated. 5-Hydroxy methyl furfuraldehyde (HS-4) exhibited the highest inhibitory effect activity against root growth on these other plants.

Program.....Biotechnology.....

Field of study.... Biotechnology.....

Academic year2002.....

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Contents

	Pages
Abstract in Thai.....	iv
Abstract in English.....	v
Acknowledgement.....	vi
List of Figures.....	x
List of Schemes.....	xiv
List of Tables.....	xv
List of Abbreviations.....	xviii
CHAPTER	
I. INTRODUCTION	
1.1 Allelopathy.....	2
1.2 Botanical Description of Family Labiatae.....	4
1.3 Literature Review of <i>Hyptis suaveolens</i> Poit.....	4
1.4 Utility of <i>Hyptis suaveolens</i> Poit.....	5
1.5 Chemical Constituents Studies on <i>Hyptis suaveolens</i> Poit.....	6
1.6 Essential Oil Composition of <i>Hyptis suaveolens</i> Poit.....	10
1.7 Biological Activity Studies of Extracts of <i>Hyptis suaveolens</i> Poit..	12
1.8 Knowledge about <i>Echinochloa crus-galli</i> Beauv. Weed	13
1.9 Goal of Research.....	14
II. EXPERIMENTAL PROCEDURES	
2.1 Source of Plant Material.....	15
2.2 Instruments and Equipment.....	15
2.3 Solvents.....	16
2.4 Chemical Test.....	16
2.5 Bioassay on Plant Growth Inhibition.....	16
2.6 Extraction and Isolation	17
2.6.1 Extraction of the Aerial Parts of <i>Hyptis suaveolens</i> Poit.....	17
2.6.2 The Separation of Crude Dichloromethane Extract.....	19
2.6.2.1 Isolation of Mixture HS-1.....	19

Contents (continued)

	Pages
2.6.2.2 Isolation of Compound HS-2.....	21
2.6.2.3 Isolation of Compound HS-3.....	21
2.6.2.4 Isolation of Compound HS-4.....	21
2.6.2.5 Isolation of Mixture HS-5.....	21
2.6.2.6 Isolation of Mixture HS-6.....	23
2.6.2.7 Isolation of Mixture HS-7.....	23
2.6.2.8 Isolation of Mixture HS-8.....	25
2.6.3 Separation of Crude Hexane Extract.....	26
2.6.3.1 Isolation of Compound HS-9.....	26
2.6.3.2 Isolation of Compound HS-10.....	27
2.6.3.3 Isolation of Compound HS-11.....	28
2.6.3.4 Isolation of Compound HS-12.....	29
2.6.3.5 Isolation of Compound HS-13.....	30
 III. RESULTS AND DISCUSSION	
3.1 Weed Growth Inhibition Bioassay Results of Preliminary Screening Tests of <i>Hyptis suaveolens</i> Poit.....	32
3.2 Weed Growth Inhibition Activity Results of Extraction of <i>Hyptis suaveolens</i> Poit.....	34
3.3 Weed Growth Inhibition Activity of Fractionation of Hexane and Dichloromethane Extract of <i>Hyptis suaveolens</i> Poit.....	35
3.3.1 Weed Growth Inhibition Activity of Hexane-derived Fractions of <i>Hyptis suaveolens</i> Poit.....	35
3.3.2 Weed Growth Inhibition Activity Results of Dichloromethane-derived Fractions of <i>H. suaveolens</i> Poit	37
3.4 Structural Elucidation of Isolated Compounds.....	39
3.4.1 Structural Elucidation of Mixture HS-1.....	39
3.4.2 Structural Elucidation of Compound HS-2.....	44
3.4.3 Structural Elucidation of Compound HS-3.....	48
3.4.4 Structural Elucidation of Compound HS-4.....	53
3.4.5 Structural Elucidation of Mixture HS-5.....	55
3.4.6 Structural Elucidation of Mixture HS-6.....	59

Contents (continued)

	Pages
3.4.7 Structural Elucidation of Mixture HS-7.....	63
3.4.8 Structural Elucidation of Mixture HS-8.....	64
3.4.9 Structural Elucidation of Compound HS-9.....	65
3.4.10 Structural Elucidation of Compound HS-10.....	69
3.4.11 Structural Elucidation of Compound HS-11.....	73
3.4.12 Structural Elucidation of Compound HS-12.....	77
3.4.13 Structural Elucidation of Compound HS-13.....	81
3.5 Weed Growth Inhibition Activity of Isolated Substances.....	85
IV. CONCLUSION	
REFERENCES.....	114
APPENDIX.....	119
VITA.....	123


 ศูนย์วิทยทรัพยากร
 จุฬาลงกรณ์มหาวิทยาลัย

List of Figures

Figures	Pages
1.1 Shoot and flower of <i>Hyptis suaveolens</i> Poit.....	5
1.2 Some isolated compounds from <i>Hyptis suaveolens</i> Poit.....	7
1.3 The percentage of various terpenoid groups found in the essential oil of <i>Hyptis suaveolens</i> Poit. leaves in Thailand.....	11
1.4 <i>Echinochloa crus-galli</i> (L.) Beauv.....	13
3.1 Inhibitory effect of 1.0 g ethanolic crude extracts of <i>H. suaveolens</i> Poit. on the seedling growth of <i>M. pigra</i> Linn. and <i>E. crus-galli</i> Beauv.....	33
3.2 Inhibitory effect of crude extracts of <i>H. suaveolens</i> Poit. on the seedling growth of <i>E. crus-galli</i> Beauv.....	35
3.3 Inhibitory effect of hexane-derived fractions of <i>H. suaveolens</i> Poit. on the seedling growth of <i>E. crus-galli</i> Beauv.....	36
3.4 Inhibitory effect of dichloromethane-derived fractions of <i>H.</i> <i>suaveolens</i> Poit. on the seedling growth of <i>E. crus-galli</i> Beauv.....	38
3.5 The mass spectrum of Mixture HS-1.....	41
3.6 The IR spectrum of Mixture HS-1.....	41
3.7 The ¹ H-NMR spectrum of Mixture HS-1.....	42
3.8 The ¹³ C-NMR spectrum of Mixture HS-1.....	42
3.9 The mass spectrum of Compound HS-2.....	45
3.10 The IR spectrum of Compound HS-2.....	45
3.11 The ¹ H-NMR spectrum of Compound HS-2.....	46
3.12 The ¹³ C-NMR spectrum of Compound HS-2.....	46
3.13 The mass spectrum of Compound HS-3.....	49
3.14 The IR spectrum of Compound HS-3.....	49
3.15 The ¹ H-NMR spectrum of Compound HS-3.....	51

List of Figures (continued)

Figures	Pages
3.16 The ^{13}C -NMR spectrum of Compound HS-3.....	51
3.17 The IR spectrum of Compound HS-4.....	53
3.18 The mass spectrum of Compound HS-4.....	53
3.19 The ^1H -NMR spectrum of Compound HS-4.....	54
3.20 The ^{13}C -NMR spectrum of Compound HS-4.....	54
3.21 The IR spectrum of Mixture HS-5.....	56
3.22 The ^1H -NMR spectrum of Mixture HS-5.....	56
3.23 The ^{13}C -NMR spectrum of Mixture HS-5.....	57
3.24 The mass spectrum of Mixture HS-5.....	57
3.25 The mass spectrum of Mixture HS-6.....	60
3.26 The IR spectrum of Mixture HS-6.....	60
3.27 The ^1H -NMR spectrum of Mixture HS-6.....	61
3.28 The ^{13}C -NMR spectrum of Mixture HS-6.....	61
3.29 The GC spectrum of Mixture HS-6.....	62
3.30 The IR spectrum of Mixture HS-7.....	63
3.31 The IR spectrum of Mixture HS-8.....	64
3.32 The IR spectrum of Compound HS-9.....	66
3.33 The mass spectrum of Compound HS-9.....	66
3.34 The ^1H -NMR spectrum of Compound HS-9.....	67
3.35 The ^{13}C -NMR spectrum of Compound HS-9.....	67
3.36 The IR spectrum of Compound HS-10.....	71
3.37 The mass spectrum of Compound HS-10.....	71
3.38 The ^1H -NMR spectrum of Compound HS-10.....	72
3.39 The ^{13}C -NMR spectrum of Compound HS-10.....	72
3.40 The mass spectrum of Compound HS-11.....	75
3.41 The IR spectrum of Compound HS-11.....	75
3.42 The ^1H -NMR spectrum of Compound HS-11.....	76
3.43 The ^{13}C -NMR spectrum of Compound HS-11.....	76
3.44 The mass spectrum of Compound HS-12.....	78
3.45 The IR spectrum of Compound HS-12.....	78

List of Figures (continued)

Figures	Pages
3.46 The ¹ H-NMR spectrum of Compound HS-12.....	79
3.47 The ¹³ C-NMR spectrum of Compound HS-12.....	79
3.48 The IR spectrum of Compound HS-13.....	83
3.49 The mass spectrum of Compound HS-13.....	83
3.50 The ¹ H-NMR spectrum of Compound HS-13.....	84
3.51 The ¹³ C-NMR spectrum of Compound HS-13.....	84
3.52 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the growth of <i>E. crus-gailli</i> Beauv.....	87
3.53 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the root growth of <i>Lactuca sativa</i> Linn.....	90
3.54 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the shoot growth of <i>Lactuca sativa</i> Linn.....	91
3.55 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the root growth of <i>Dactyloctenium aegyptium</i> Willd.....	93
3.56 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the shoot growth of <i>Dactyloctenium aegyptium</i> Willd.....	94
3.57 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the root growth of <i>Trianthema portulacastrum</i> Linn.....	96
3.58 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the shoot growth of <i>Trianthema portulacastrum</i> Linn.....	97
3.59 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the root growth of <i>Pennisetum polystachyon</i> Schult.....	99
3.60 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the shoot growth of <i>Pennisetum polystachyon</i> Schult.....	100
3.61 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the root growth of <i>Bidens pilosa</i> Linn.....	102
3.62 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the shoot growth of <i>Bidens pilosa</i> Linn.....	103
3.63 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the root growth of <i>Brassica chinense</i> Jusl.....	105

List of Figures (continued)

Figures	Page
3.64 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the shoot growth of <i>Brassica chinense</i> Jusl.....	106



ศูนย์วิจัยทรัพยากรชีว
จุฬาลงกรณ์มหาวิทยาลัย

List of Schemes

Schemes	Pages
2.1 The extraction and fractionation procedure for preliminary study of plant sample.....	18
2.2 Isolation scheme of dichloromethane extract.....	22
2.3 The isolation procedure of fraction B of dichloromethane extract.....	24
2.4 The isolation procedure of fraction A of dichloromethane extract.....	25
2.5 Isolation scheme of hexane extract.....	27
2.6 The isolation procedure of fraction J of hexane extract.....	29
2.7 The isolation procedure of fraction K of hexane extract.....	31



 ศูนย์วิจัยทรัพยากรชีวเวชศาสตร์
 จุฬาลงกรณ์มหาวิทยาลัย

List of Tables

Tables	Pages
1.5 Chemical Constituents of <i>Hyptis suaveolens</i> Poit.....	6
1.7 Biological activities of the extracts of <i>Hyptis suaveolens</i> Poit.....	12
2.1 The separation of dichloromethane extract by quick column chromatography.....	19
2.2 The separation of dichloromethane extract by long column chromatography.....	20
2.3 Fractionation of the fraction C3 by column chromatography.....	20
2.4 The separation of hexane extract by quick column chromatography....	26
2.5 The separation of fraction J of hexane extract by long column chromatography.....	28
2.6 The separation of fraction K of hexane extract by long column chromatography.....	30
3.1 Inhibitory effect of ethanolic crude extracts of <i>H. suaveolens</i> Poit. on the growth of <i>M. pigra</i> Linn.....	32
3.2 Inhibitory effect of ethanolic crude extracts of <i>H. suaveolens</i> Poit. on the growth of <i>E. crus-galli</i> Beauv.....	33
3.3 Inhibitory effect of crude extracts of <i>H. suaveolens</i> Poit. on the growth of <i>E. crus-galli</i> Beauv.....	34
3.4 Inhibitory effect of hexane-derived fractions crude of <i>H. suaveolens</i> Poit. on the growth of <i>E. crus-galli</i> Beauv.....	36
3.5 Inhibitory effect of dichloromethane-derived fractions crude extracts of <i>H. suaveolens</i> Poit. on the seedling growth of <i>E. crus-galli</i> Beauv.	37
3.6 The composition of steroids in HS-1.....	40
3.7 The ¹³ C-NMR chemical shift assignment of β-sitosterol, stigmasterol and Mixture HS-1 (in CDCl ₃).....	43

List of Tables (continued)

Tables	Pages
3.8 The ^{13}C -NMR spectral assignment of oleanolic acid and Compound HS-2 (in CDCl_3).....	47
3.9 The ^{13}C -NMR spectral data assignment of genkwanin and Compound HS-3 (in DMSO-d_6).....	50
3.10 Structure of steroid glucoside in Mixture HS-5.....	58
3.11 The ^{13}C -NMR chemical shift assignment of β -amyrin and Compound HS-9 (in CDCl_3).....	68
3.12 The ^{13}C -NMR chemical shift assignment of α -amyrin and Compound HS-10 (in CDCl_3).....	70
3.13 The ^1H NMR chemical shift assignments of Compound HS-11 and lupeol (in CDCl_3).....	73
3.14 The ^{13}C -NMR chemical shift assignment of lupeol and Compound HS-11 (in CDCl_3).....	74
3.15 The ^1H -NMR chemical shift assignments of Compound HS-12 and betulinic acid (in CDCl_3).....	77
3.16 The ^{13}C -NMR spectral assignment of betulinic acid and Compound HS-12 (in CDCl_3).....	80
3.17 The ^{13}C -NMR spectral assignment of betulinic acid and Compound HS-13 (in DMSO-d_6)	82
3.18 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the growth of <i>Echinochloa crus-galli</i> Beauv.....	86
3.19 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the growth of <i>Lactuca sativa</i> Linn.....	89
3.20 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the growth of <i>Dactyloctenium aegyptium</i> Willd.....	92
3.21 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the growth of <i>Trianthema portulacastrum</i> Linn.....	95
3.22 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the growth of <i>Pennisetum polystachyon</i> Schult.....	98

List of Tables (continued)

Tables	Pages
3.23 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the growth of <i>Bidens pilosa</i> Linn.....	101
3.24 Inhibitory effect of isolated substances from <i>H. suaveolens</i> Poit. on the growth of <i>Brassica chinense</i> Jusl.....	104
3.25 Allelopathy effect on various plants of isolated substances from <i>Hyptis suaveolens</i> Poit.....	109
3.26 The summary of allelopathic effect of isolated substances from <i>Hyptis suaveolens</i> Poit. against monocotyledon and dicotyledon.....	111



 ศูนย์วิทยุทรัพยากร
 จุฬาลงกรณ์มหาวิทยาลัย

List of Abbreviations

^{13}C NMR	=	Carbon-13 Nuclear Magnetic Resonance
^1H NMR	=	Proton-1 Nuclear Magnetic Resonance
δ	=	Chemical shift
d	=	Doublet (NMR)
dd	=	Doublet of doublets (NMR)
DMSO	=	Dimethyl sulfoxide
EIMS	=	Electron Impact Mass Spectra
Fig	=	Figure
g	=	Gram (s)
GC/MS	=	Gas Chromatograph / Mass Spectrometry
J	=	Coupling constant
KBr	=	Potassium bromide
Kg	=	Kilogram (s)
M^+	=	Molecular ion
m/z	=	Mass to charge ratio
ppm	=	Part per million
s	=	Singlet (NMR)
TLC	=	Thin Layer Chromatography
t	=	Triplet (NMR)
cm^{-1}	=	Unit of wave number
IR	=	Infrared
MW	=	Molecular weight
m	=	Multiplet (NMR)
ml	=	Milliliter (s)
No.	=	Number
R_f	=	Retarding factor in chromatogram
wt	=	Weight