

การศึกษาทางพุทธเคมีของใบขลุ่



นางสาวสุปรียา รอดเกิด

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาเภสัชศาสตรมหาบัณฑิต

ภาควิชาเภสัชพฤกษศาสตร์

บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

พ.ศ. ๒๕๒๖

ISBN 974-561-757-1

007871

i 1799889 X

PHYTOCHEMICAL STUDIES OF *Pluchea indica* Less. LEAVES



MISS SUPREEYA RODKIRD

A Thesis Submitted in Partial Fulfillment of the Requirements  
for the Degree of Master of Science in Pharmacy

Department of Pharmaceutical Botany

Graduate School

Chulalongkorn University

1983

Thesis Title      Phytochemical Studies of *Pluchea indica*  
                         Less. Leaves.  
By                      Miss Supreeya Rodkird  
Department        Pharmaceutical Botany  
Thesis Advisors   Professor Payom Tantivatana, Ph.D.  
                         Assistant Professor Nijsiri Ruangrungsi,  
                         M.Sc.



---

Accepted by the Graduate School, Chulalongkorn  
University in Partial Fulfillment of the Requirements for  
the Master's Degree.

..... *S. Bunnag* ..... Dean of Graduate School  
(Associate Professor Supradit Bunnag, Ph.D.)

Thesis Committee

... *Vichara Jirawongse* ..... Chairman

(Professor Vichara A. Jirawongse, Ph.D.)

... *M.L. Pranod Xumsaeng* ..... Member

(Professor M.L. Pranod Xumsaeng, B.Sc. in Pharm.)

... *Payom Tantivatana* ..... Member

(Professor Payom Tantivatana, Ph.D.)

... *Dhavadee Ponglux* ..... Member

(Associate Professor Dhavadee Ponglux, Ph.D.)

... *Ekarin Saifah* ..... Member

(Assistant Professor Ekarin Saifah, Ph.D.)

... *Nijsiri Ruangrungsi* ..... Member

(Assistant Professor Nijsiri Ruangrungsi, M.Sc.)

หัวข้อวิทยานิพนธ์	การศึกษาทางพฤษเคมีของใบขลุ่
ชื่อนิสิต	นางสาวสุปรียา รอดเกิด
อาจารย์ที่ปรึกษา	ศาสตราจารย์ ดร.พยอม ตันติวัฒน์ ผู้ช่วยศาสตราจารย์นิจศิริ เรืองรังษี
ภาควิชา	เภสัชพฤษศาสตร์
ปีการศึกษา	2525

บทคัดย่อ



จากการสกัดใบขลุ่ได้สาร 3-(2',3'-diacetoxy-2'-methyl butyryl)-cuauhtemone ซึ่งเป็นอนุพันธ์ชนิดใหม่ของ eudesmane การหาสูตร โครงสร้างของสารนี้ ได้ทำโดยใช้ 400 MHz proton nmr และปฏิกิริยาทางเคมี ควบคู่กันไป

Thesis Title      Phytochemical Studies of *Pluchea indica*  
Less. Leaves.

Name                Miss Supreeya Rodkird

Thesis Advisors   Professor Payom Tantivatana, Ph.D.  
Assistant Professor Nijsiri Ruangrunsi,  
M.Sc.

Department        Pharmaceutical Botany

Academic Year     1982



ABSTRACT

Extraction of *Pluchea indica* Less. leaves (Compositae) afforded 3-(2',3'-diacetoxy-2'-methyl butyryl)-cuauhtemone, a new eudesmane derivative. The structure has been established through 400 MHz proton nmr spectroscopy and chemical correlation.



## ACKNOWLEDGEMENTS

The author is deeply indebted and grateful to her advisor, Professor Dr. Payom Tantivatana, Head of the Department of Pharmaceutical Botany, Faculty of Pharmaceutical Sciences, Chulalongkorn University, for her kindness in accepting her to study in the Department of Pharmaceutical Botany, valuable suggestions, useful guidances, continual interest, and encouragements throughout the course of this study.

The author wishes to express her deep appreciation and thanks her coadvisor, Assistant Professor Nijisiri Ruangrunsi of the Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Chulalongkorn University, for his kindness, helpful guidances, valuable advice, contiguous interest, and continual encouragements throughout the course of this work.

The author would further like to acknowledge her sincere gratitude to Professor Geoffrey A. Cordell of the Department of Pharmacognosy and Pharmacology, College of Pharmacy, University of Illinois, for his kindness in interpretation of the Ultraviolet, Infrared, Nuclear Magnetic Resonance, Mass Spectrum and also for his invaluable discussions on the characterisation and identification of the isolated compound.

The author feels gratefully indebted to her parents for the collection of plant materials.

Finally, the author's grateful thanks are also due to Graduate School, Chulalongkorn University, for teaching assistant funds of sixteen thousand and eight hundred Baht and her partial financial support of seven thousand Baht to fulfill this work.

## CONTENTS



	page
ABSTRACT (Thai).....	iv
ABSTRACT (English).....	v
ACKNOWLEDGEMENTS.....	vi
CHAPTER I INTRODUCTION.....	1
CHAPTER II HISTORICAL	
1. Review of Chemical Compounds in Inuleae.....	4
1.1 Terpenoids	
1.1.1 Monoterpenoids.....	5
1.1.2 Sesquiterpenoids.....	6
1.1.3 Sesquiterpene lactones.....	8
1.1.4 Diterpenoids.....	11
1.1.5 Triterpenoids.....	12
1.2 Flavonoids.....	14
1.3 Simple Phenolics.....	18
1.4 Alkaloids.....	19
1.5 Polyols and Cyclitols.....	20
1.6 Lipids.....	20
1.7 Polyacetylenes.....	21
2. Chemical Compounds Isolated from <i>Pluchea</i>	
Species.....	22
3. Biosynthesis of Terpenoids	
3.1 Introduction.....	23
3.2 Biosynthesis of Sesquiterpenoids.....	33
3.3 Biosynthesis of Eudesmane.....	36



4.	Distribution of Eudesmane in Compositae apart from <i>Pluchea</i> .....	40
5.	Other Sources of Eudesmane in Plant and Animal Kingdoms	
5.1	Plant Sources.....	45
5.2	Animal Source.....	52

### CHAPTER III EXPERIMENTAL

1.	Source of Plant Material.....	53
2.	General Techniques	
2.1	Thin Layer Chromatography.....	53
2.2	Column Chromatography.....	54
2.3	Melting Point.....	54
2.4	Ultraviolet Absorption Spectrum.....	54
2.5	Infrared Absorption Spectrum.....	54
2.6	Nuclear Magnetic Resonance Spectra.....	54
2.7	Mass Spectrum.....	55
3.	Isolation of Chemical Substances from <i>Pluchea indica</i> Less. Leaves	
3.1	Extraction.....	55
3.2	Isolation of Chemical Compounds.....	55
4.	Characterisation of PI-1.....	56

### CHAPTER IV DISCUSSION

1.	Structure of the New Naturally Occurring Eudesmane Derivative.....	62
2.	The Chemotaxonomic Significance of Eudesmane in <i>Pluchea</i> .....	68

CHAPTER V CONCLUSION AND RECOMMENDATION.....	69
REFERENCES.....	71
APPENDIX	
Detection.....	82
Solvents and Chemicals used.....	82
Key to Figures.....	82
Thin layer chromatograms.....	83
Spectra.....	87
VITA.....	95