

UNIVERSITI TEKNOLOGI MARA

**PHYTOCHEMICAL STUDY ON *MEIOGYNE
VIRGATA* BLUME MIQ. (ANNONACEAE)**

ABD. RASHID LI

Thesis submitted in fulfillment of the requirements
for the degree of
Master of Science

Faculty of Applied Sciences

July 2007

Candidate's Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of University Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any other degree or qualification.

In the event that my thesis be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and agree to be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

Name of Candidate : Abd. Rashid Bin Li
Candidate's ID No. : 2001310323
Faculty : Applied Sciences
Thesis Title : Phytochemical Study on *Meiogyne virgata* Blume
Miq. (Annonaceae)

Signature of Candidate
Date 12 / 07 / 2007

ABSTRACT

Meiogyne virgata is a rain forest tree which grows in Peninsular Malaysia, Borneo, Java and Sumatera. Temuan clans in Peninsular Malaysia call it "Cha ngut". Its fruits are poisonous. There is no formal report on the traditional uses of this plant. However, Tadic *et al.*, (1986) reported the isolation of isoquinoline alkaloids and triterpenes possessing important biological activities from stem barks and leaves of *M. virgata* collected from Mount Kinabalu, Sabah. It was suggested that this plant may be useful medicinally. In the present work, phytochemical studies were conducted on *M. virgata* collected from Hutan Simpan Besor, Jeli, Kelantan with the aim of isolating and determining the alkaloids from the dichloromethane extract and triterpene contents from the petroleum ether extracts in the stem barks of this plant. The alkaloids and triterpenes were structurally identified using modern spectroscopic techniques especially 1-D and 2-D NMR. From this study, five aporphine alkaloids; norushinsunine (277.0 mg), liriodenine (125.0 mg), lysicamine (4.5 mg), a mixture of anonaine and nornuciferine (17.3 mg) were isolated from dichloromethane extract. Two sterols appearing as mixture of β -sitosterol and stigmasterol (365.0 mg) and two oxidized sterols also appearing as a mixture of β -sitostenone and stigmast-4-en-3-one (90.2 mg) from petroleum ether extract were successfully isolated. During this study, we used SPE FLASH Si cartridges to fractionate and isolate these particular compounds. The use of SPE cartridges provides a rapid method with lesser solvent consumption, making it a more efficient method as compared to conventional column chromatography. Biosynthetic relationships between the alkaloids obtained have been proposed in this study. A biosynthetic pathways leading to the unsubstituted ring D aporphine alkaloids could explained the discovery of different types and composition of compounds compared to those in Tadic *et al.* study.

ACKNOWLEDGEMENTS

I would like to thank my supervisor Assoc. Prof. Dr. Nor Hadiani Ismail and my co-supervisor Prof. Dr. Khalijah Awang (UM) for their guidance, advice, encouragement and support throughout this research project. I am indebted to the past and present member of the Natural Research Group of UiTM and UM, especially Puan Faridahanim Mohd. Jaafar (UiTM) and Assoc. Prof. Dr. Mat Ropi Mukhtar (UM) for introduced the field of alkaloids to me.

I would like to thank the technical staff at Natural Product Laboratory of UiTM and UM, especially En. Adnan Ismail (UiTM) and Pak Din (UM) for their technical assistance throughout this research period.

I am grateful to my friends at NPL of UiTM and UM who lightened my burden with continuous supports. They included Syed Abd. Illah, Suzirawati, Azharuddin, Nordin, Nazif, Zunoliza, Mardiana and Sharipah.

I would like to thank my wife Maryam Husin (who has to work and support the family) and to my son Muhammad Yusuf Aiman for their sacrifices and encouragement throughout this studies.

Finally, I would like to thank to thank to Pasca-Siswazah UiTM for financial support during this studies.

TABLE OF CONTENTS

	Page
TITLE PAGE	i
ABSTRACT	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
LIST OF PLATES	viii
LIST OF FIGURES	ix
LIST OF SCHEMES	xii
LIST OF ABBREVIATIONS	xiii
CHAPTER 1: INTRODUCTION	1
CHAPTER 2: LITERATURE REVIEWS	4
2.1 The Family Annonaceae	4
2.1.1 Distribution and Origin	5
2.1.2 Appearance and Morphology of the Annonaceae	6
2.1.3 Annonaceae As Medicines- Traditional Medicinal Value of Asiatic Annonaceae	7
2.2 The Genus <i>Meiogyne</i>	8
2.3 <i>Meiogyne virgata</i> (Blume) Miq.	8
2.4 Alkaloids in Annonaceous Plants	10
2.4.1 The Alkaloids	10
2.4.2 Characteristics of Alkaloids	13
2.4.3 Classification of Alkaloids	13
2.4.4 True Alkaloids	15
2.5 Isoquinoline Alkaloids	20
2.5.1 Classification of Isoquinoline Alkaloids	20
2.5.2 Biogenetic Relationship between Isoquinoline Alkaloid Sub-Classes	21