

## CONTENTS

Acknowledgements	page
List of schemes and figures	ii
List of tables	v
Abstract	vi
Abstrak	vii
Abbreviations	viii
	ix
<b>CHAPTER 1</b>	<b>1</b>
<b>1.0 INTRODUCTION</b>	<b>2</b>
1.1 Classification of Annonaceae	3
1.2 Tribe Unoneae	6
1.3 Genus Desmos	7
1.3.1 Botanical Features	7
1.3.2 Medicinal Properties and Biological Activities	7
<b>CHAPTER 2</b>	<b>9</b>
<b>2.0 GENERAL CHEMICAL ASPECT</b>	<b>10</b>
2.1 Alkaloids	10
2.1.1 The Isoquinoline Alkaloids	13
2.1.1.1 Aporphines	13
2.1.1.2 Proaporphines	20
2.1.1.3 Oxoaporphines	26
2.1.1.4 Tetrahydroprotoberberines	28
2.2 Flavonoids	31
2.2.1 Flavones	35
2.3 The Biosynthesis Relationship Between The Aporphine Alkaloids	39
2.3.1 The Biosynthesis Relationship Between Proaporphines and Aporphines	39
2.3.2 The Biosynthesis Relationship Between Aporphines and Oxoaporphines	40
2.3.3 The Biosynthesis Relationship Between Benzylisoquinolines and Tetrahydroprotoberberines	41

<b>CHAPTER 3</b>	42
<b>3.0 RESULTS AND DISCUSSION</b>	43
3.1 Compounds Isolated From The Leaves	43
3.2 Compounds Isolated From The Bark	59
<b>CHAPTER 4</b>	61
<b>CONCLUSION</b>	62
<b>CHAPTER 5</b>	66
<b>EXPERIMENTAL</b>	67
<b>REFERENCES</b>	80
<b>APPENDICES</b>	90

## LIST OF SCHEMES AND FIGURES

	page
<b>Schemes</b>	
1. Mass fragmentations of aporphine alkaloids	16
2. The formation of [ M-15] <sup>+</sup> and [ M-31] <sup>+</sup>	17
3. The formation of [M-29] <sup>+</sup> , [M-43] <sup>+</sup> , [M-44] <sup>+</sup> , [M-58] <sup>+</sup> , [M-60] <sup>+</sup> , [M-74] <sup>+</sup>	18
4. The formation of [ M-29 ] <sup>+</sup> of proaporphines	22
5. The formation of [M-29] <sup>+</sup> or [M-43] <sup>+</sup> by the retro-Diels-Alder fragmentation	23
6. The retro-Diels-Alder fragmentation of N-acetyl proaporphines	24
7. Mass fragmentations of tetrahydroprotoberberines	30
8. Mass fragmentations of flavone	38
9. The biosynthesis relationship between proaporphines and aporphines	39
10. The synthesis from pronuciferine <b>37</b> (proaporphine) to nuciferine <b>38</b> (aporphine)	40
11. The biosynthesis relationship proposed between benzyloisoquinolines and tetrahydroprotoberberines	41
12. Mass fragmentations of pronuciferine <b>37</b>	45
13. Mass fragmentations pattern of normuciferine <b>40</b>	49
14. The proposed biogenetic relationship of the alkaloids isolated	65

**Figures**

	page
1. The UV spectra of aporphines	19
2. The UV spectra of aporphines (with and without substituent at C-11)	19
3. COSY spectrum of pronuciferine <b>37</b>	46
4. Electron donating effect of C-5 hydroxyl	58
5. Electron withdrawing effect of carbonyl group on H-3	58
6. Structures of compound isolated from <i>Desmos dumosus</i>	64
7. <i>Desmos dumosus</i>	70

**LIST OF TABLES**

	page
1. The classification of Annonaceae	4
2. The genera of Annonaceae	5
3. The relationship in the tribe of Unoneae	6
4. Compounds isolated from <i>Desmos dumosus</i>	63
5. The relationship between spot color and flavonoids structure	69
6. The yield of chemical constituents of the leaves	73
7. The yield of chemical constituents of the bark	74