CHAPTER 4

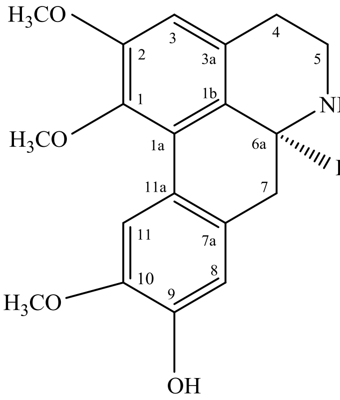
CONCLUSION

CHAPTER 4

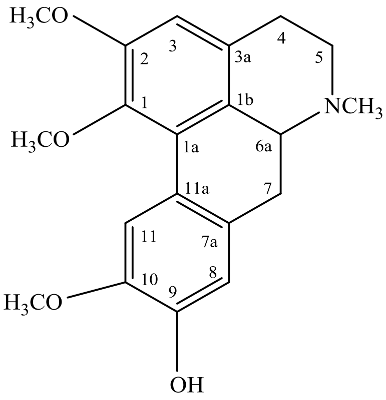
CONCLUSION

The bark and leaves of *Cryptocarya densiflora* have been fully studied for their alkaloidal contents. Six alkaloids have been isolated from the bark of this species namely laurotetanine **63**, isocaryachine **64**, *N*-demetyhlphyllocryptine **65**, nornantenine **66**, reticuline **14**, laudanidine **2**, and four alkaloids were obtained from leaves namely dicentrinone **67**, crychine **60**, cryptocaryadine **68**, and *N*-methyllaurotetanine **53**. The alkaloids obtained belong to four different classes as stated below:

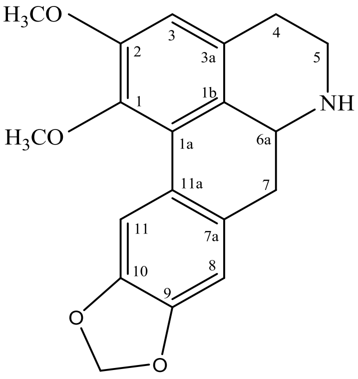
4.1 Aporphine alkaloids:



63



53

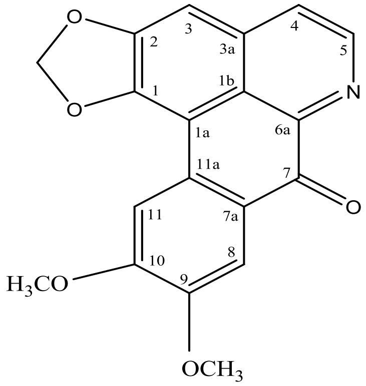


66

Laurotetanine **63**, *N*-methyllaurotetanine **53** and nornatenine **66**.

The aporphines represent a large and still expanding group of isoquinoline alkaloids. They are found only in plants belonging to the families of Annonaceae, Berberidaceae, Lauraceae, Magnoliacea, Menispermaceae, Monimiaceae, Ranunculaceae (order Ranales), Papaveraceae (order Rhoedales), and Rhamnaceae. In ^1H NMR spectra, two doublets appeared around δ 6.00 if it contains a methylenedioxy at C-9 and C-10. The aliphatic protons can be observed at C-4 and C-5. Typical aporphine type alkaloids usually portray this type of characteristic[59]. H-3 normally resonates at a higher field compared to the other aromatic protons (δ 6.50-6.70) when it is ortho to a hydroxyl or a methoxyl. This is due to induction effect. On the other hand, H-11 is usually resonates at a lower field with respect to the other protons due to the deshielding effect imposed by the facing aromatic ring A and hydrogen bonding with the C-1 substituent in ring A[59].

4.2. Oxoaporphine alkaloid:

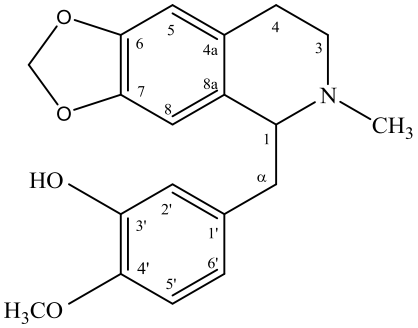


67

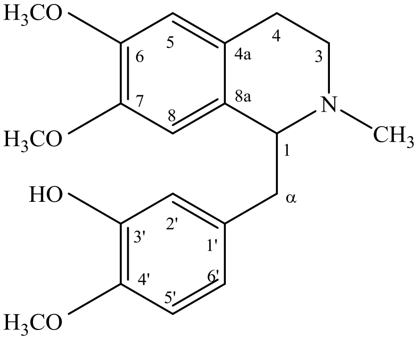
Dicentrinone **67**.

The oxoaporphines consist of carbonyl group at C-7. They are usually colored such as red, orange and yellow because of their high degree of aromaticity. ^1H NMR spectral data have shown that H-5 is the most deshielded proton and H-4 and H-5 have a coupling constant of 5 Hz. The C-3 proton singlet appeared at higher field if C-1 and C-2 were substituted. On contrary, the C-11 proton is usually the most downfield as a result of the ring current effect of the facing ring A. Past studies of this compound revealed that dicentrinone **67** was isolated from *Cryptocarya rugulosa*[106].

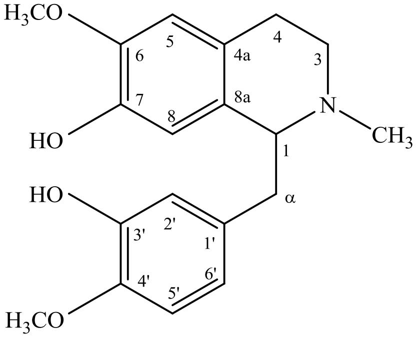
4.3. Benzylisoquinoline alkaloids:



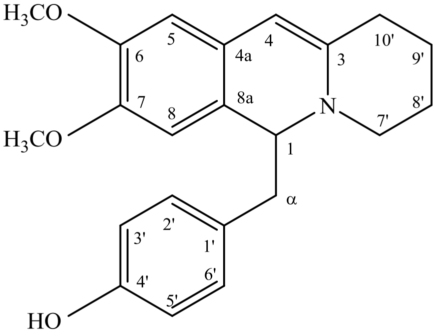
65



2



14

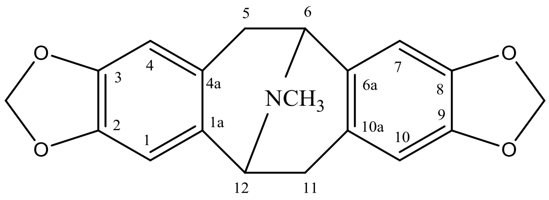


68

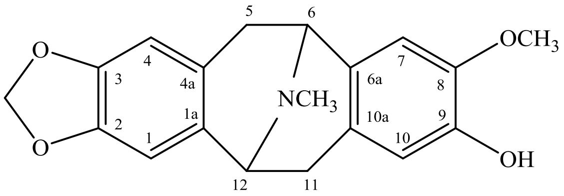
N-Demethylphyllocryptine **65**, laudanidine **2**, reticuline **14** and cryptocaryadine **68**.

A doublet of doublets signal belongs to H-6’ with coupling constants of 1.9 and 8.3 Hz due to this signal *ortho* to H-5’ and *metha* to H-2’. These are the characteristic of benzylisoquinoline when C-3’ and C-4’ are substituted. H-3, 4 and α appeared as multiplet in the ^{1}H NMR spectrum[52]. The methylenedioxy resonated at δ 5.6-6.0. Base on the study of benzylisoquinoline, this group can be attached to C-6, 7 and C-3’, 4’. When the position of methylenedioxy attached to C-6 and C-7, the signal showed as a doublet or singlet.

4.4. Pavine alkaloids:



60



64

Crychine **60** and isocaryachine **64**

The isoquinoline alkaloids with a pavine skeleton are very rare in plant kingdom. The alkaloids are found at least in four plant families, namely Papaveraceae, Berberidaceae, Lauraceae and Ranuculaceae. The characteristic of pavine type are an *N*H or *N*Me bridge attached between C-6 and C-12 and two aromatic rings besides 8 member rings respectively. In the ^{1}H NMR, the chemical shifts of methoxyl group of the pavine alkaloids appeared at δ 3.7-3.9. Furthermore the methylenedioxy group resonated at δ 5.8-5.9 while aromatic proton will appeared at δ 6.5-6.7. One peak attributed to methyl group attached to nitrogen was observed at δ 2.4-2.5. The determining factor has been stated to be the inductive effect of the bridgehead C-N bond, causing deshielding and consequently downfield shifting of H-1 and H-7[70]. The aromatic protons are always resonating in the region of δ 6.0-7.2[107]. Past studies revealed that crychine **60** and isocaryachine **64** were isolated from *Cryptocarya chinensis*[10].

Out of ten alkaloids isolated from this study, one is new alkaloid, cryprocaryadine **68** isolated from the leaves of *cryptocarya densiflora*, which is afforded as a major compound.

In conclusion, this is the first study of alkaloids from the species of *Cryptocarya densiflora*. The species can be a source of pharmacological interesting molecules. In connection with this, more biological activities can be performed on the isolated alkaloids.