

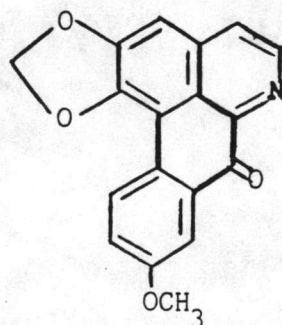
## CHAPTER IV

### DISCUSSION

According to previous study on the alkaloids of *Annona squamosa* Linn., the majority of the alkaloids are aporphine alkaloids occurring together with two oxoaporphine (liriodenine and lanuginosine).

There have been no previous informations from the phytochemical point of view on *A. squamosa* Linn. growing in Thailand. Chromatographic studies of leaves extract of *A. squamosa* Linn. showed that crude extract contained at least seven alkaloids. These alkaloids are present in mixture, each of small quantity and are difficult to separate from one another.

The present work has led to the isolation of a crystalline alkaloid N<sub>1</sub>. The alkaloid N<sub>1</sub> was identified as lanuginosine by comparison with the ultraviolet, infrared, nuclear magnetic resonance and mass spectra with the published data of lanuginosine (4,101,102).



Lanuginosine

The UV spectrum showed that it is oxoaporphine alkaloid.

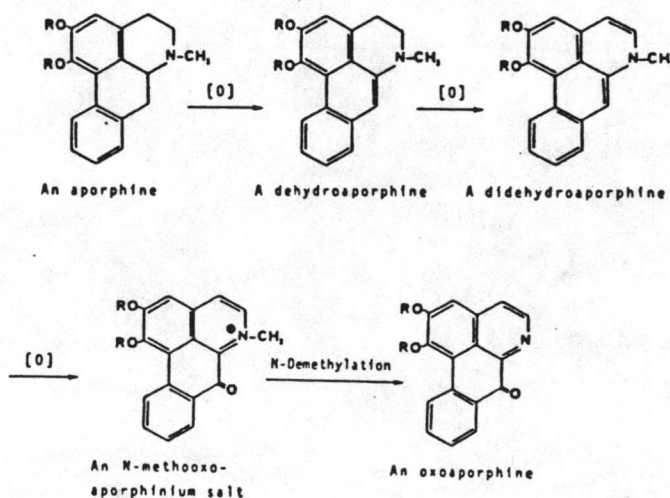
The IR spectrum indicated a conjugated C=O at  $1655\text{ cm}^{-1}$  which is oxoaporphine alkaloid characteristic.

The NMR spectrum exhibits signal of three protons, singlet, of side chain  $-\text{OCH}_3$  at  $\delta$  3.99 ppm and two protons, singlet, of  $\text{CH}_2$  at 6.35 ppm. The signals at  $\delta$  7.77 and 8.88 ppm have J (coupling constant) = 5 Hz, which are the protons at position 4 and 5 respectively.

The characteristic of the mass spectrum of the alkaloid  $\text{N}_1$  is having the  $\text{M}^+$  ion,  $m/e = 305$  as base peak and cleavage of  $-\text{CH}_2\text{O}$  side chain to give  $\text{M}^+ - 30$ ,  $m/e = 275$ .

$\text{N}_1$  (lanuginosine) is yellowish-brown tabular crystal.

Naturally, oxoaporphine alkaloids are found to accompany aporphine in plants. A rational sequence of *in vivo* transformations leading from an aporphine to its corresponding oxoaporphine would be through the intermediacy of dehydro- and didehydroaporphines as delineated below.



Although several naturally occurring dehydroaporphines are known, didehydroaporphines are generally too unstable to be fully characterized. Whereas most aporphine alkaloids incorporate an N-methyl group, the corresponding oxoaporphines do not. This is because N-methoxoaporphinium salts undergo facile N-demethylation to the free base even on a TLC plate. The oxidation of an aporphine to its oxoaporphine analog may thus take place simply upon prolonged contact with air, and may not always be enzyme mediated (89).

In conclusion, the biogenesis of "Lanuginosine" may proceed via the above delineation from the aporphine "Xylopine" which is cooccurred in *Annona squamosa* Linn.