

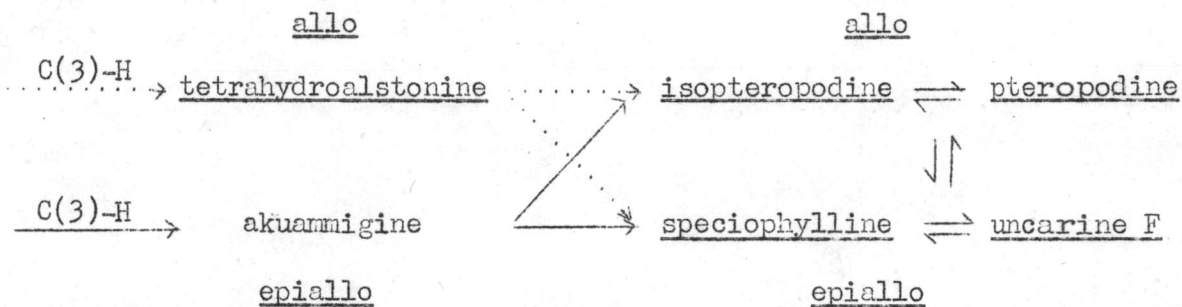
## CHAPTER IV

## DISCUSSION

The investigation of alkaloidal patterns in the leaves of Uncaria homomalla Miq. collected from the same plant at regular monthly intervals showed that dominant alkaloids were pentacyclic unsubstituted oxindole alkaloids, with allo configuration, viz. isopteropodine and pteropodine together with their epiallo analogues, viz. speciophylline and uncarine F. The corresponding heteroyohimbine alkaloid of allo configuration, tetrahydroalstonine, was shown to be present in trace amount in some months only i.e. from May to August 1976 and from April to June 1977, which were before flowering period and after fruiting period respectively. However, akuammigine, which is the corresponding heteroyohimbine alkaloid of epiallo configuration, was not found.

The same situation also occurred in Mitragyna parvifolia (Roxb.) Korth.<sup>(63)</sup> where no corresponding heteroyohimbine alkaloid of isomitraphylline and mitraphylline was isolated.

In accordance with the hypothesis of Shellard and Houghton,<sup>(68)</sup> i.e. the main biogenetic route of alkaloids is from the C(3)-H $\beta$  precursor and a minor route via the C(3)-H $\alpha$  precursor, the alkaloidal scheme in the leaves of Uncaria homomalla Miq. should be :-



————→ major route

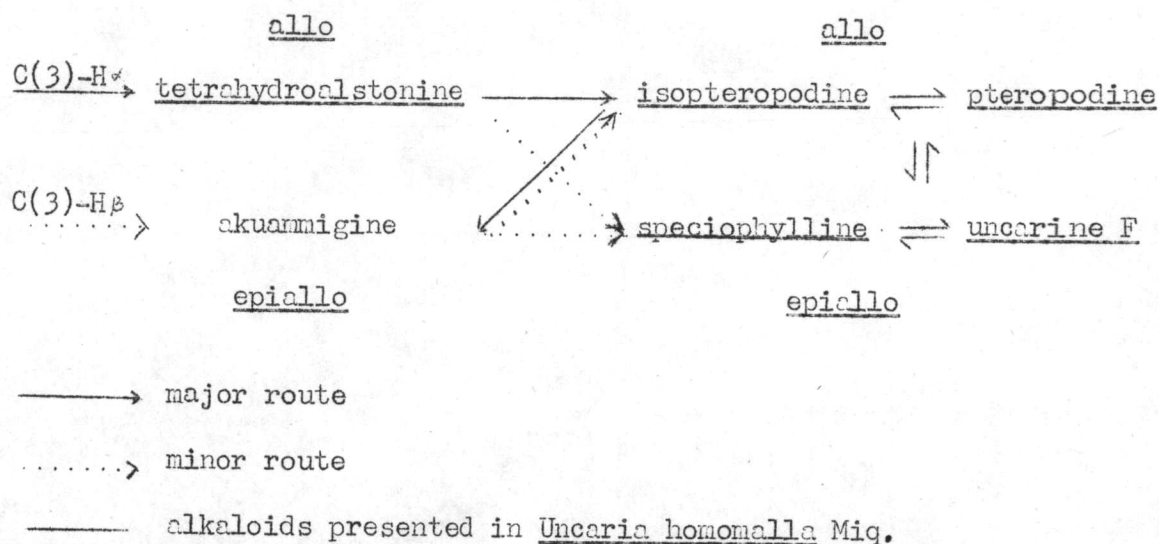
.....→ minor route

———— alkaloids presented in Uncaria homonalla miq.

Thus, the absence of akuammigine needs explanation and this might be due to three possibilities :-

1. nearly all akuammigine is isomerised to its corresponding oxindoles and the amount present is too small to be detected,
2. biogenesis does not take place in the leaves and only certain alkaloids are transferred from the site of biogenesis to the leaves, and
3. according to Phillipson and Hemingway (16) who proposed that there might be interconversion between the allo and epiallo alkaloids in Uncaria, some of akuammigine might be isomerised to tetrahydroalstonine.

Recently Shellard et al. (32) suggested that the main biogenetic route of alkaloid might be C(3)-H $\alpha$  precursor, resulting from the experiment by Stöckigt and Zenk. (153) Thus, following this new hypothesis, the alkaloidal scheme in the leaves of Uncaria homonalla Miq. would be :-



In this case, the absence of akuammigine can be more easily explained as it is in the minor route so the amount might be too small to be detected and/or all has been isomerised to the corresponding oxindoles which are the dominant alkaloids in this plant.

The evidence that only traces of tetrahydroalstonine were found and only in some months, might be due to the amount of isomerisation to the more stable alkaloids, i.e. corresponding oxindoles.

The dominant alkaloids found in this present work were the same as those reported by Ponglux et al.,<sup>(26)</sup> from Uncaria homomalla Miq growing in Chantaburi, about 400 km from Saraburi.

It should be noted that there was no tetracyclic oxindole alkaloids, and this was similar to the results reported by Phillipson et al.<sup>(10)</sup> They investigated eight samples of Uncaria homomalla Miq. and found that two samples contained the mitraphylline, two contained pteropodine isomers, one contained both types, and the remaining three

samples yielded three pyridino-indolo-quinolizidinone alkaloids, i.e. angustine, angustidine and angustoline.

Uncaria rhynchophylla Havil. and Uncaria homonalla Miq. are the only two species in the genus to contain high yields of the pyridino indolo-quinolizidinone alkaloids. (12) Only angustine could be detected in this investigation and it was detected during and after fruiting period, i.e. January to June 1977 and also in May and July, 1976. The absence of this type of alkaloids may be connected with seasonal variations in the extent of alkaloid biosynthesis, and the findings with the monthly collections of Mitragyna parvifolia (Roxb.) Korth. leaves were also a pointer in this direction. (12)

It should also be noted that, from June to December, 1976, the amounts of isopteropodine were low while that of pteropodine were high. This might be due to the equilibrium of their isomerisation. In contrast, there was no significant difference between speciophylline and uncarine F. High yields of total alkaloids were obtained before and after flowering and fruiting periods. Biogenesis of the alkaloids might be connected with the variation in season and age of the plant.

In addition, in every plant sample examined, two unidentified oxindole alkaloids which hRf values lower than those of speciophylline were shown to be present. Another unidentified oxindole was detected from January to April, 1977. The quantities of these oxindole alkaloids were too small to be isolated out and identified. Further large scale of extraction is required to be able to identify them. Similarly, "base-line" oxindole alkaloid(s) also require the same performance.