

## PART IV

### CONCLUSION

D. metel var. fastuosa grown in the experimental plot, was monitored for the growth, dry matter, total alkaloids and major alkaloids, hyoscyamine (atropine) and hyoscyne. Fertilizer application had no effect on growth, dry matter, total alkaloids and major alkaloids. However, there was direct relationship between the stages of development with dry matter production and its alkaloid contents. The plant produced the highest dry matter yield from leaves and flowers in flowering stage ( $S_2$ ), followed by the fruit maturing ( $S_3$ ) and the vegetative ( $S_1$ ) stages successively. In regard to its alkaloid contents from the leaves, the maximum total alkaloid contents was produced in the fruit ripening stage ( $S_3$ ) in which the production had begun since  $S_1$  and reached the maximum period in  $S_3$ . It was found that in the  $S_2$  stage, the total alkaloid contents from leaves and flowers were the highest. And in this stage ( $S_2$ ), there was more hyoscyamine (atropine) than hyoscyne.

In commercial application, D. metel var. fastuosa need relatively low fertilizer application and the optimal harvesting time would be the flowering stage ( $S_2$ ) when it could give the highest total yield of dry matter and the amount of active ingredient (0.8871% of total alkaloids) from this dry matter. Also in this stage ( $S_2$ ), it could give hyoscyamine (atropine) as the major alkaloid. This alkaloid could serve as a substitute for

Belladonna and Stramonium in tinctures and other pharmaceutical products so as to reduce the importation expenses. At present, commercial sources of tropane alkaloids still depends on naturally occurring raw materials in leaves and flowering tops, such as Duboisia myoporoides (5%) (Somanabandhu and Suntorncharoenon 1980), Hyoscyamus niger ( $>0.05\%$ ) (British Pharmacopoeia 1980), Atropa belladonna ( $>0.03\%$ ) (British Pharmacopoeia 1980) and Datura stramonium ( $>0.25\%$ ) (British Pharmacopoeia 1980). Therefore, the cultivation of D. metel var. fastuosa would be very useful and economical.

For alkaloid analysis, GLC was a reliable technique for assay of hyoscyamine (atropine) and hyoscyne from the plant extracts because of its specificity, sensitivity and high resolving properties. In this experiment, the official USP method was adapted by using more suitable conditions and methyl linoleate could be used as an internal standard for each alkaloid in plant extracts. The results obtained in this study clearly demonstrated that under the conditions employed, GLC was an excellent method in the determination of hyoscyamine (atropine) and hyoscyne.

To improve the total alkaloid contents in D. metel var. fastuosa, further works should be encouraged in breeding of a better variety or cross breed the plant with other datura species. In addition, improving of the cultural methods of the crop should be made.