

CHAPTER V

CONCLUSION

A total of 42 samples representing 9 species and 6 unidentified samples of the genus *Cinnamomum* have been collected from 10 provinces of Thailand. The chemical compositions of essential leaf oil from these samples were analyzed by headspace GC-MS technique. The peak areas of 128 volatile compounds were used as dependent variables for chemometric analysis. To reduce the effect of natural variation within species, the data of the peak area from each chromatogram were normalized and scored.

Two chemometric methods, hierarchical cluster analysis (HCA) and principal component analysis (PCA), were performed to classify the samples in terms of their chemical profile. It is clear that cluster analysis using Pearson correlation and the between group linkage is an adequate chemometric method in making chemical classification analysis for this study.

According to GC-MS and cluster analysis, the leaf essential oils of 48 samples were classified into eight main clusters. A cluster of linalool-rich essential leaf oil contained *C. camphora*, *C. iners*, and *C. subavenium*, while the camphor-type of *C. camphora* samples were grouped together in another cluster. All samples of *C. verum* were also classified into one cluster even though 2 chemical groups (linalool and eugenol) were observed. The samples of *C. porrectum*, *C. pachyphyllum*, and *C. tamala* were in each distinct cluster. Most of *C. iners* leaf oils contain caryophyllene as the major component, and they were group together in the largest cluster which consists of various species. This cluster is further divided into sub-cluster of *C. subavenium*.

Based on the resultg of this study, the chemometric cluster analysis of essential leaf oil can be used in the classification of intraspecific chemotype, confirmation of species identification and classification of unidentified species.

However, it is important to note that the effectiveness of chemometric analysis is based on the quantity and quality of the database. The more complete and proper database, the more useful information can be extracted.