CHAPTER I
INTRODUCTION

Cinnamomum, belonging to the family Lauraceae, is an economically important genus which comprises about 350 species of aromatic trees and shrubs (Mabberly, 1997) occurring in the tropical and subtropical regions. Its species distribute in continental Asia, East and Southeast Asia, Australia, Pacific islands and a few species in Central and South America. A number of these species have medicinal and spice value, such as cinnamon and cassia, which are among the oldest of spices. Its characteristic aroma and flavor finds many uses in the food, cosmetics and pharmaceutical industries. Despite more than 300 species of this genus, the cinnamon and cassia of commerce are derived from 4 species, *Cinnamomum verum* Presl (true or Ceylon cinnamon), *C. cassia* Presl (Chinese cinnamon or cassia lignea), *C. burmannii* Blume (Indonesian or Padang cassia) and *C. loureirii* Nees (Vietnamese or Saigon cassia). The quality of cinnamon (or cassia), and ultimately the price it commands, depends on some factors such as the botanical source, the method of production, the yield of essential oil and the composition of the oil (Jayatilaka *et al.*, 1995).

In Thailand, although many *Cinnamomum* species are widely used in traditional medicine and as spices, the research and development of these plants for commercial purposes are still rarely conducted. One of the major obstacles that slow down the study of Thai *Cinnamomum* is taxonomic confusion. There is no publication on taxonomy of this genus in the Flora of Thailand. The poorly defined and doubtful classical taxonomy based on reproductive structure leads to difficulty in correctly identifying the species. Taxonomy is further complicated by the existence of chemotypes or chemical races within the species that do not differ significantly in morphology.

The information gathered from essential oil studies has proved to be valuable in the taxonomic and evolutionary investigation of plants. The use of information on the chemical constituents from the gas chromatograms of oils could lead to improvements in plant classification. Moreover, multivariate chemometric methods have the ability to

offer quantitative measures by which species may be unambiguously compared (Dunlop *et al*, 1997).

Chemometrics is broadly defined as the application of mathematical and statistical methods to extract information from chemical data (Deming, 1986). Advance in analytical technique such as headspace-gas chromatography (HS-GC) combined with mass spectrometry (MS) and automatic instruments can easily produce large amount of analytical data. It is now possible to investigate chemical constituents of hundreds of essential oils from aromatic plants in short time. The high throughput technologies and methods of analysis have led to a bottleneck in obtaining the relevant information from the plethora of chemical data. Chemometrics is a powerful method to analyze the numerous data from essential oils and would provide useful information for the quality control of food, cosmetics or pharmaceuticals (Cotroneo *et al.*, 1990) and authentication of oils (Cotroneo *et al.*, 1988). Most of all, chemical compositions of essential oils can help in making taxonomic judgement with some confidence by using chemometric analysis (Canigueral *et al.*, 1994; Dunlop *et al.*, 1995).

Tropical rain forests, as Thailand's forests, are considered as one of the most biologically diverse area of the world. Nineteen species of *Cinnamomum* have been reported by Tem Smitinand in the Thai Plants Names (2001). The objective of this study is to classify the members of this genus in terms of their chemical profiles by chemometric analysis of the essential oils composition. The results will complement morphological taxonomy and help to define the different species of the genus.