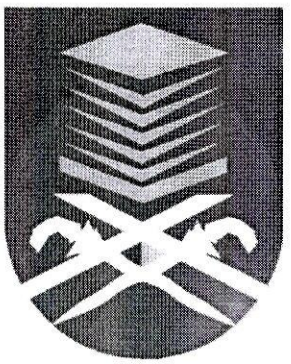
ESSENTIAL OILS FROM *LITSEA* SPECIES



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OCTOBER 2005

Date : 30 October 2005

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Dear Professor,

FINAL RESEARCH REPORT "ESSENTIAL OILS FROM *LITSEA* SPECIES"

With reference to the above, I am pleased to submit three copies of the Final Research Report entitled, "Essential Oils from *Litsea* Species".

Thank you.

Yours sincerely,

KHONG HENG YEN
The Leader
Research Project

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ABSTRACT

The chemical compositions of the essential oil from some *Litsea* species (*L.sessilis*, *L. megacarpa*, *L.machilifolia*, *L.ferestrata*, *L.ferruginea*, *L.gracilipes* and *L.resinosa*) were obtained in a clevenger-type apparatus by hydrodistillation (Datta, 1987). Thirty-six components were identified using Gas Chromatography-Mass Spectroscopy (GC/MS) and Gas Chromatography–Flame Ionisation Detector (GC/FID). The major compositions of these volatile oils were sesquiterpenes: 88.38% in *L. megacarpa* (leaf), 83.82% in *L. ferestrata* (leaf), 74.26% in *L. gracilipes* (stem) and 56.73% in *L. machilifolia* (stem); aldehydes/ketones: 67.10% in *L. sessilis* (leaf); alcohols: 39.47% in the leaf oils and 70.68% in the stem oils of *L. resinosa*. For leaf oil, *L. megacarpa* contained the most caryophyllene oxide (56.89%) but pentadecanal (23.80%) was the most abundant in *L. sessilis*. For *L. ferestrata* and *L. resinosa*, the most abundant components were (-)-globulol with 28.91% and 2-naphthalenemethanol with 15.48% respectively. The major compounds in the stem oil were different for different species. *L. resinosa* had a very high proportion of 2-naphthalenemethanol (54.29%). In contrast, *L. machilifolia* and *L. gracilipes* had a relatively high percentage of globulol (27.43%) and (-)-globulol (35.24%), respectively. The brine shrimp lethality bioassay test (BSLT) demonstrated that *L. gracilipes* was the most active with LD_{50} value, followed by *L. machilifolia* and *L. sessilis*. Most of the essential oils of *Litsea* species were not toxic. Statistical analysis using Cluster Analysis on the SPSS software Program was used to reduce the complicity of compounds data identified in essential oils. Thirty-six components of leaf oils and stem oils were selected and clustered into 13 and 9 groups respectively. This study revealed that chemical composition could be used for chemotaxonomical purposes.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Litsea is one of the 35 genera under the family of Lauraceae. A total of 400 species of *Litsea* are distributed throughout the tropical and subtropical Asia (except Africa), the Pacific, Australia and New Zealand. In Peninsular Malaysia, *Litsea* is represented by 54 species (Corner, 1988). *Litsea* species as well as any other Lauraceae are locally known as '*Medang*' or '*Tejur*'. *Litsea* species are abundant in the wild in Sarawak (Sim, 1971).

Litsea trees have smooth bark, brown in colour and are seldom split. *Litsea* leaves are arranged alternately and singly, rarely subopposite. *Litsea* is characterized by its inflorescences, trimerous flowers and 4-locular anthers (Henk V.D.W., 2001).

Litsea species are known to contain aporphine alkaloids (Tewari *et at.*, 1971), flavonoids, sesquiterpenes (Gottlieb, 1972; Achmad *et al.*, 2004) and essential oils (Lawless, 1996; Lyth and Charles, 1998). These essential oils are used as the basic raw materials in flavouring, perfumes, preparation of beverages, medicines, cosmetics, and cleaning preparations. Since the early 1980's, *L. cubeba* has become the most important source of cheap natural citral.