

**CHEMICAL CONSTITUENTS, NUTRITIONAL COMPOSITION AND BIOLOGICAL ACTIVITIES OF
*Litsea garciae***



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5. Report

5.1 Proposed Executive Summary

There are several local Malaysian *Litsea* species which have ethnobotanical uses but so far, very few studies have been carried out to link these folkloric uses with the phytochemistry of these plant species. It would be interesting therefore, to develop phytochemical profile of one such Sarawakian species, *Litsea garciae*, a species not reported before.

Some species of *Litsea* have been shown to possess interesting biological activities such as cytotoxic, antibacterial and antioxidant activities. Leaf and stem bark samples of *Litsea garciae* will be extracted and purified using standard protocols which involve conventional extraction technique such as chromatographic methods. Analyses for structural elucidations of pure bioactive compounds will involve the usual spectroscopic techniques such as NMR, FTIR, UV and MS.

The isolation and identification of these natural products will lead the researchers to establish a profile of chemical and biological activities of the extract for standardisation and product development. The outcome of this project, which is a documentation of medicinal plants rich in active compounds, is for further investigation for their potential uses in drug development.

5.2 Enhanced Executive Summary

Malaysian *Litsea* species has already been used ethnobotanically but only few studies have been carried out to link these traditional uses with the phytochemistry of those species. The chemical profile of the indigenous plants from Sarawak, such as *Litsea garciae* has also not been studied intensively and analyses of medicinal properties have not been explored.

Previous chemical studies on *Litsea* revealed the occurrence of various classes of natural product compounds such as aporphine alkaloid, alkaloid and triterpenes/steroids. In addition, *Litsea* species exhibits various biological activities, such as anti-inflammatory, calming properties and other therapeutic actions such as astringent, antiseptic, insecticide, hypotensive stimulant and tonic (Marie, 1999; Liu et al., 2007). *Litsea* species is used in treating coronary heart disease (Wang et al., 1985; Wu et al., 1991), to prevent and treat alcoholic hepatitis (Liu et al., 2007) and has therapeutic effect against atopic eczema (Anderson et al., 2000). The species also demonstrates antioxidant activity (Hwang et al., 2005).

Different parts of *L. garciae* were extracted and purified using standard protocols of conventional extraction technique such as chromatography methods.

A detailed study on the isolation of leaf and bark extracts of *Litsea garciae* were carried out using chromatographic methods. The methanolic crude extracts of *Litsea garciae* were screened for their cytotoxic activities against Cervical Cancer (HeLa) cell lines, Human Breast Cancer (MCF-7) cell lines and Human Colorectal Cancer (HT-29) cell lines. Meanwhile, anti-inflammatory activities were performed by three different assays method: assay for inhibition of lipoxygenase activity, assays for inhibition of hyaluronidase activity and assay for inhibition of xanthine oxidase (anti-gout properties).

The first study on the pharmacology of *Litsea garciae* from Sarawak showed moderate cytotoxic property and weak anti-inflammatory activity. The findings also show that *Litsea garciae* is a good source of carbohydrate and protein but demonstrates weak antimicrobial and antibacterial activity. Isolation of leaf and bark extracts of *Litsea garciae* produced stearic acid and 16-hentriacontanone as the major compound.

5.3 Introduction

Litsea (Lauraceae) genus has about 400 species distributed throughout the tropical and subtropical Asia (except Africa), the Pacific, Australia, and New Zealand. About 54 *Litsea* species were identified in Peninsular Malaysia (Corner, 1998) and about 22 in Borneo island, upon which 47 species were reduced to synonymy (Ng, 2005). Local communities such as the Bidayuh and Iban use some local *Litsea* species as traditional medicine to treat sprained or swollen ankle or knee, scabies and gastric problem. *Litsea graciae* are used as an antidote against scorpion bite, centipede, snake bite and wound caused by poisonous fish fins. In addition, *L. Accedens* and *L. Insignis* are used to treat stomachache and for invigorating purposes after childbirth (Chai, 2006).

Malaysian *Litsea* species has already been used ethnobotanically but only few studies have been carried out to link the traditional uses with their phytochemistry. The chemical profile of the indigenous plants from Sarawak, such as *Litsea garciae* has also not been studied intensively and the analyses of their medicinal properties have not been explored.

Previous study showed that *Litsea* species contains aporphine alkaloid, alkaloid, triterpenes/steroids and other interesting compounds. Therefore, this research aims to isolate all the bioactive compounds in *Litsea garciae* and to determine their antioxidant and antimicrobial properties. This research is also a hopeful attempt to create a documentation of medicinal plants which are rich in active compounds for further investigation in drug development. In addition, it also will provide useful information for biotechnology research and development based on our government's National Biotechnology Policy to develop products deriving from local plants and herbs. Besides that, the outcome of this research will hopefully be able to provide chemical profile for extract standardisation and fingerprinting to benefit manufacturers in development of herbal products.