

ABSTRACT

A Chemical Investigation of *Ficus microcarpa*, *Sapium hippomane* and *Simarouba amara*

Sumieya Nadira Jawarriyah Grosvenor

This thesis describes the extraction, isolation and characterization of secondary metabolites from *Ficus microcarpa* (Moraceae), *Sapium hippomane* (Euphorbiaceae) and *Simarouba amara* (Simaroubaceae). The structures of these compounds were determined using data acquired from various spectrometric and spectroscopic methods including COSY, HMQC, HSQC, HMBC, NOESY, T-ROESY, IR, UV and MS.

This study is reported in three chapters. Chapter one addresses the chemical investigation of *Ficus microcarpa*. It contains a brief review of the compounds that were previously isolated from the species, the extraction and isolation protocols used and the structural elucidation of the compounds that were isolated. A megastigmane, two flavan-3-ols, an isoflavone, the commonly isolated linear diterpene, phytol, a sterol and two new dammarane triterpenes were isolated.

Chapter two provides a brief account of the chemical constituents previously isolated from the *Sapium* genus, followed by a description of the chemical investigation and subsequent structural elucidation of the compounds isolated from *Sapium hippomane*. Two new phorbol esters, 4-deoxyphorbol, the 4-deoxyphorbol triacetate and

the known neo-lignan, balanophonin were isolated. To date, this is the first time that a chemical investigation of *S. hippomane* has been reported.

Chapter three concludes with the chemical re-investigation of *Simarouba amara*. A brief account of the previous investigation was provided, in addition to the extraction and isolation protocols and the structural elucidation of the compounds obtained in the present study. In this study, a new octanor triterpene and four new apotirucallanes (one of which was tentative) were acquired.

Keywords: Sumieya Nadira Jawarriyah Grosvenor; extraction, isolation and characterization; *Ficus microcarpa* (Moraceae); *Sapium hippomane* (Euphorbiaceae); *Simarouba amara* (Simaroubaceae); apotirucallane; dammarane; flavan-3-ol; isoflavone; megastigmane; nor-isoprenoid; neo-lignan; octanor triterpene; sterol; triterpene.