SECONDARY METABOLITES FROM *HYPTIS VERTICILLATA* AND BIOTRANSFORMATIONS OF STEROIDS BY *EXOPHIALA* SP.

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ABSTRACT

Part 1 of this thesis details an investigation of the secondary metabolites from *Hyptis verticillata.* Chapter 1 reviews the chemical literature of the *Hyptis* genus. Chapter 2 entails a brief introduction to *H. verticillata.* The isolation and structural determination of several compounds from the methanol extract of dried aerial parts of *H. verticillata* are outlined in Chapter 3. These are the phytosterols β-sitosterol (1) and stigmasterol (2), the triterpenes ursolic (3) and oleanolic (4) acids, the lignans 4'-demethyldesoxypodophyllotoxin (5), deoxydehydropodophyllotoxin (6), dehydro-β-peltatin methyl ether (7), 5-methoxydehydropodophyllotoxin (8), and dehydropodophyllotoxin (9) and the flavonol 3',4',5-trihydroxy-3,6,7-trimethoxyflavonol (10). Examination of the green plant is discussed in Chapter 4. This led to the isolation of two additional compounds, the lignan (-)-deoxypodorhizon (11) and the sesquiterpene cadina-4,10(15)-dien-3-one (12). The

pesticidal activities of cadina-4,10(15)-dien-3-one along with the analysis of the essential oils are discussed.

Part II presents an investigation of the biotransformations of steroids by the fungus *Exophiala* sp., a previously undescribed fungus. Some of the mechanisms of transformation by P-450 enzymes are reviewed in Chapter 1. Chapter 2 discusses the analysis of metabolites formed during fermentation of added steroids.