

ABSTRACT

This thesis is a continuation of work done on the Jamaican Amyris genus and deals mainly with the structural elucidation of constituents isolated from the two plants, Amyris elemifera and Amyris plumieri. Previous reports on Amyris balsamifera and Amyris plumieri have defined that this genus belongs to Rutaceae and not Burseraceae as suggested by certain authors. The contents of this thesis fully concur with our earlier findings.

In Part I, the biogenetic pathways leading to the major groups of secondary metabolites isolated from the Jamaican Amyris genus are reviewed and a putative phylogeny of the genus based on chemosystematics is presented. A possible generic marker for use in chemotaxonomy has also emerged from this study.

Part II includes the identification of eleven compounds isolated from the leaves and twigs of Amyris plumieri. These include one new nicotinamide, Compound I, which is the cis-isomer of the known styrylamide, Compound II and two new oxazoles, Compounds X and XI. Confirmation of the structure of Compound I by synthesis of its dihydro derivative and an interesting cyclisation of Compound I to a Δ^2 -oxazoline are discussed here. Compounds V and VI were isolated as a mixture. This mixture was previously isolated from Amyris plumieri but was thought to be a pure compound and therefore assigned an incorrect structure. The elucidation of their correct structures are presented and these are found to be two new chromenylylated tyramides. Also described in this section is the confirmation of the structure of Compound V by synthesis.

Part III deals with the constituents of Amyris elemifera. Compounds A, H, I and J are new C-3 prenylated coumarins. The 3-(3',3'-dimethylallyl) sidechain possessed by these coumarins is unique to the genus Amyris and has previously only been reported on two occasions. The structure of Compound A was established by correlation with the coumarin, balsamiferone. The high oxidation levels of the sidechains in Compounds H, I and J have not occurred before in any C-3 alkylated coumarin and these are the first reports of coumarins of this nature. In addition to these, Amyris elemifera also furnished the known coumarins, Compounds B, D, E, F, G, K, L and M. Compound C, marmesin acetate is also new although its enantiomer, nodakenetin acetate has been isolated as a natural product.