

ABSTRACT

Phytochemistry of Endemic Species from Jamaican Euphorbiaceae and Asclepiadaceae

Richard Washington Denton

The families Euphorbiaceae and Asclepiadaceae are known to produce compounds of significant structural, pharmacological and ecological interest. In this thesis the phytochemistry of three endemic Jamaican species *Jatropha divaricata*, and *Omphalea triandra* (Euphorbiaceae) and *Cynanchum rendlei* (Asclepiadaceae) were studied. Compounds were isolated by various chromatographic techniques and characterized by chemical and spectroscopic methods. This dissertation is divided into two sections, Section I and Section II.

In Section I, an overview of the secondary metabolites isolated from the family Euphorbiaceae is given. This is then followed by a description of the metabolites retrieved from the genera *Jatropha* and *Omphalea*. The isolation and structural elucidation of the constituents from the species *Jatropha divaricata* is

then described. This plant produced fifteen compounds. These include four diterpenes, (compounds A-D), five shikimic acid derived metabolites (compounds E, F, G and N), two polyprenoid derivatives (compounds L and K), a tocopherol derivative (compound J), a sterol (compound I) and two triglycerides containing both saturated and unsaturated acyl moieties (compounds M1 and M2). Section I also includes a detailed discussion of the absolute stereochemistry at the stereocenters present in compound A. Bioassays done on compound A revealed that it possesses significant mosquitocidal and antimicrobial activities. The isolation and characterization of the metabolites from the species *Omphalea triandra* is also described in this section. This led to the identification of four polyprenoids (compounds O, P, Q and R1), a tocopherol (compound R2), two phytyl *para*-quinone derivatives (compounds S1 and S2) and a long chain fatty acid (compound T).

Section II begins with a review of the family Asclepiadaceae and the genus *Cynanchum*. A report of the isolation and structural elucidation of the secondary metabolites isolated from *Cynanchum rendlei* follows. These include a polyprene (compound U), three triterpenes (compounds V, X1 and X2) and a triterpene ester (compound W). Compound W is derived from the rare triterpene alcohol, germanicol (57).