

NOVEL CUCURBITACINS FROM *FEVILLEA CORDIFOLIA*

AND

NATURAL PESTICIDES FROM *PETIVERA ALLIACEA*

Lyndon B. N. Johnson, Department of Chemistry,
University of the West Indies, Mona, Kingston 7,
JAMAICA

ABSTRACT

Part I of this thesis details an investigation of the Jamaican medicinal plant *Fevillea cordifolia* L. (Cucurbitaceae), which resulted in the isolation, purification and structure elucidation of six new cucurbitacins. Chapter 1 is a recent review of the cucurbitacins and examines the structures, biological activities, chemical ecology and synthesis of the cucurbitacins, in addition to providing examples of other compounds that possess the unusual 19(10 $\rightarrow$ 9)abeo- skeleton.

Chapter 2 examines chromatographic strategies for the purification of polar natural products, in particular the application of high performance liquid chromatography (HPLC) to the analysis of cucurbitacins of *Fevillea cordifolia*.

In chapter 3, the structure elucidation of cordifolin A $3\beta,16\alpha$ -dihydroxy-20,25-epoxy-19(10 $\rightarrow$ 9 β) abeo-10 α -lanost-5-ene-11,22-dione—a novel cucurbitacin bearing a cyclised side-chain, and the model compound used in this study—by the concerted use of nuclear magnetic resonance and mass spectral techniques, is discussed.

The further structure determination of cordifolin B ($3\beta,16\alpha,22\alpha$ -trihydroxy-20,25-epoxy-19(10 $\rightarrow$ 9 β) abeo-10 α -lanosta-5,23-dien-11-one), cordifolin A diglucoside (3-O- β -D-glucosyl-6,1- β -D-glucopyranoside-cordifolin A), cordifolin C (22-deoxo-cordifolin B), fevicordin B glucoside (2-O- β -D-glucopyranoside-3,16 α , 20 β ,22(R),25-pentahydroxy-19(10 $\rightarrow$ 9 β) abeo-10 α -28 nor-lanosta-1,3,5/10,23-tetraen-11-one), and fevicordin B diglucoside (2-O- β -D-glucosyl-6,1- β -D-glucopyranoside-fevicordin B) are discussed in Chapter 4.

Biogenetic speculations are presented in Chapter 5.

Part II investigates the occurrence of natural products which possess insecticidal activities in *Petivera alliacea* L. In Chapter 6, the extraction, purification, structure elucidation, and synthesis of polysulfides possessing insecticidal activities are discussed. An outline of the biological activities is also given.