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CHEMISTRY AND ACTIVITY OF *AEGLE MARMELLOS*

AND *MURRAYA KOENIGII* (RUTACEAE)

A THESIS SUBMITTED BY

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ABSTRACT

This thesis consists of two parts.

The first part describes an investigation into the chemistry and insecticidal activity of the root bark of *Aegle marmelos*.

The basic fraction of this extract contained five known furoquinoline alkaloids, robustine, dictamnine, δ -fagarine, skimmianine and haplopine together with an isofuroquinoline alkaloid, norskimmianine. Robustine has not been previously reported from this plant and norskimmianine has not been previously isolated from natural sources.

The neutral fraction contained the two alkaloids 4-methoxy-1-methyl-2-quinolone and O-methylhalfordinol, the terpene, lupeol and sitosterol. The fraction also contained six known coumarins, auropten, 7-(7'-chloro-3',7'-dimethyl-3',6'-dioxyoctyloxy)coumarin, 6',7'-epoxyauroptene, 6'-oxoauropten, umbelliferone and marmin, of which 6'-oxoauropten has not been previously isolated from this plant. A new coumarin, 7-(6'-hydroxy-3',7'-dimethylocta-2,7-dienyloxy)coumarin was also isolated from the fraction. The chlorocoumarin is believed to be an artifact formed by the acid catalyzed rupture of the epoxide ring in 6',7'-epoxyauroptene during the separation of the basic fraction.

The basic fraction of the methanol extract contained all the alkaloids isolated from the basic fraction of the dichloromethane extract except robustine, while the neutral fraction contained the coumarins, imperatorin, scoporone and 7'-methoxymarmin together with the compounds present in the neutral fraction of dichloromethane extract, except for the two alkaloids, the chlorocoumarin and the new coumarin. 7'-Methoxymarmin too is believed to be an artifact formed during extraction with methanol.

The dichloromethane extract of *A. marmelos* root bark showed insecticidal activity against *Heliothis zea* and *Aedes aegyptii* larvae. Bioassay directed fractionation of the active extract revealed that skimmianine was responsible for the activity.

Dictamnine, O-methylhalfordinol, robustine, imperatorin present in the extract were found to be active against *A. aegyptii* larvae, while auraptene, 6',7'-epoxyauraptene and umbelliferone showed growth inhibition of the larvae. Of these, dictamnine and robustine were found to be most active.

The second part of this thesis describes the isolation and characterization of a mosquito larvicidal compound, 3-methoxy-2-methylcarbazole present in the dichloromethane extract of *Murraya koenigii* stem bark.