

**CHEMISTRY OF SOME INSECTICIDAL
RUTACEAE OF SRI LANKA**

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IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

MASTER OF PHILOSOPHY

OF THE

UNIVERSITY OF PERADENIYA

SRI LANKA

December 1992

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ABSTRACT

This thesis consists of two parts. The first part describes the chemical investigation and insecticidal activity of *Pamburus missionis*. The root bark of the plant contained three coumarins ostruthin, xanthyletin, imperatorin and a new coumarin 7-hydroxy-8-geranyl-coumarin, together with an indole alkaloid, 3-(3'-methyl-1'-oxobut-2'-enyl)1H indole and sitosterol. Four coumarins ostruthin, xanthyletin, xanthotoxin and imperatorin were found in the stem bark. The root timber had ostruthin, xanthyletin, indole alkaloid and sitosterol. The main constituents of the fruit were xanthyletin and xanthotoxin. Apart from these three more coumarins isopimpinellin, scopoletin and luvangetin were isolated from the fruit.

The hexane and dichloromethane extracts of *P. missionis* stem and root barks exhibited insecticidal, herbicidal and endoparasiticidal activity. The present work includes a detailed investigation into the insecticidal activity of the stem bark. The bioassay directed fractionation of the active extract led to the isolation of two active compounds, xanthyletin and imperatorin which were active against *Diabrotica* and *Lucilia*.

The second part of the thesis discusses the chemical investigation and insecticidal activity of the root bark of *Chloroxylon swietenia*. The stem bark of the plant has been extensively studied by Indian scientists. In our study of the root constituents, we found it to contain the furanocoumarins, swietenocoumarin A, B, C, G, H, and isopimpenillin, the dehydrofuranocoumarins, heliottin and 8-prenylnodakenetin and the furoquinoline alkaloid skimmianine, all of which have been isolated previously from *C. swietenia* stem bark.

The root bark extract exhibited insecticidal activity against *Culex pipiens quinquefasciatus*. Bioassay directed fractionation of the root bark extract showed that the activity was due to two compounds, swietenocoumarin A and B, which while inactive or moderately active by themselves, were together strongly active through a synergistic effect. The extract also showed insect antifeedant activity against the tobacco cut worm *Spodoptera litura*. This activity was found to decrease during repeated bioassay directed fractionation. The most active fraction was found to contain 8-prenylnodakenetin.

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