

U  
540  
JAY

**CHEMISTRY AND BIOACTIVITY OF SOME SRI LANKAN  
MENISPERMACEAE AND RUBIACEAE**

A THESIS PRESENTED

BY

J. A. C. P. JAYASOORIYA

2

to the Board of Study in Chemical Sciences of the  
**POSTGRADUATE INSTITUTE OF SCIENCE**

*in partial fulfillment of the requirement  
for the award of the degree of*

**MASTER OF PHILOSOPHY**

of the

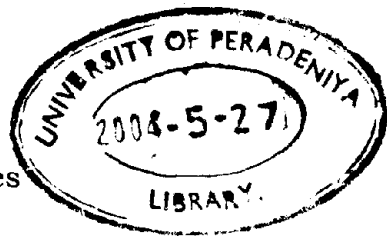
**UNIVERSITY OF PERADENIYA  
SRI LANKA**

2003

571466

# CHEMISTRY AND BIOACTIVITY OF SOME SRI LANKAN MENISPERMACEAE AND RUBIACEAE

**J. A. C. P. Jayasooriya**  
Natural Products Project  
Institute of Fundamental Studies  
Kandy  
Sri Lanka



This thesis includes two parts. Part I describes the chemistry and bioactivity studies of the leaves of *Diploclisia glaucescens* of the family Menispermaceae and part II describes antimicrobial activity studies of thirteen Sri Lankan plant species of family Rubiaceae.

## Part I

*Diploclisia glaucescens* is a creeper climbing up about twenty-five meters high and is totally glabrous. It is distributed in the mid country regions of South India and Sri Lanka. It has been reported that the leaves of this plant are used to treat biliousness and venereal diseases.

Chromatographic separation of the ethyl acetate extract yielded three ecdysteroids low polar than 20-hydroxyecdysone, which is generally considered as the moulting hormone in insects. They were identified as makisterone A, dihydrorubrosterone and *epi*-pterosterone. This is the first report of dihydrorubrosterone and *epi*-pterosterone from the family Menispermaceae. Makisterone A has been previously reported from the seeds of *D. glaucescens*.

Chemical investigation of the *n*-hexane extract of the leaves of *Diploclisia glaucescens* furnished stigmasterol.

Chromatographic separation of the methanol extract afforded two ecdysteroids, 20-hydroxyecdysone and a new ecdysteroid, 3-deoxy-1 $\beta$ -20-dihydroxyecdysone and three saponins,  $\beta$ -sitosterol-D-glucoside, 3-O- $\beta$ -D-glucopyranosyl-(1 $\rightarrow$ 3)- $\beta$ -D-glucopyranosyl-28-O- $\beta$ -D-glucopyranosyloleanolic acid and 3-O- $\beta$ -D-xylopyranosyl-(1 $\rightarrow$ 2)- $\beta$ -D-glucopyranosyl-28-O- $\beta$ -D-glucopyranosyloleanolic acid. Latter two triterpenoidal saponins are reported for the first time from the family Menispermaceae.

Structure elucidation of the isolates was mainly based on spectroscopic techniques such as NMR, HMBC, HMQC, H-H COSY, NOE, etc and chemical methods such as acid hydrolysis, acetylation etc.

All isolates were tested for their antifungal activity against *Cladosporium cladosporioides* using TLC bioautography method. None of them showed any activity.

## Part II

Ninety solvent extracts (*n*-hexane, dichloromethane and methanol) obtained from the leaves and bark of thirteen Sri Lankan Rubiaceae plants; *Benkara malabarica*, *Canthium coromandelicum*, *Canthium dicoccum*, *Haldina cordifolia*, *Ixora calycina*, *Morinda tinctoriya*, *Mussaenda frondosa*, *Psychotria gardneri*, *Psychotria nigra*, *Psychotria stenophylla*, *Saprosma foetens*, *Tarenna asiatica* and *Wendlandia bicuspidata* were tested for antibacterial activity against *Escherichia coli* (Gram-), *Micrococcus luteus* (Gram+), *Bacillus subtilis* (Gram+), *Bacillus cereus* (Gram+) and antifungal activity against *Saccharomyces cerevisiae*, *Ustilago maydis* and *Aspergillus niger* by Disk diffusion method.

*Morinda tinctoriya*, *Mussaenda frondosa*, *Psychotria gardneri* and *Psychotria stenophylla* displayed the widest spectrum of antibacterial activity.