

CHEMICAL INVESTIGATION AND
BIOLOGICAL ACTIVITY STUDIES OF
ENDEMIC *GORDONIA* SPECIES

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Abstract

Gordonia ceylanica (Wight) and *Gordonia dassanayakei* (Wadhwa et Weerasooriya) are the two endemic *Gordonia* species belong to family Theaceae. This thesis describes the chemical investigation and antibacterial / anti-fungal activity studies of the stem bark extracts of *G. ceylanica* and *G. dassanayakei*.

Chemical investigation of the stem bark of *G. ceylanica* gave eight Oleanane triterpenoids, one triterpenoidal glycoside and one steroidal compound. The stem bark of *G. dassanayakei* had been shown to contain seven Oleanane and one Hopane triterpenoids, one steroidal glycoside and two steroids.

The natural products, 3β -acetoxy- $11\alpha,13$ -dihydroxyolean-12-one and $3\beta,11\alpha$ -diacetoxy-13-hydroxyolean-12-one isolated from both plant species have not been previously reported. These two Oleanane triterpenoides on treatment with acid resulted in a very interesting rearrangement of methyl groups. The dehydration at C-13 and the subsequent methyl group migration from C-14 to C-13, which converted the Oleanane triterpenoid to a Taraxarane type of triterpenoid.

The natural products, 3β -acetoxy-28-hydroxyolean-12-ene and 3β -acetoxy-11-[2'-3'epoxyferulyloxy]-olean-13(18)-ene isolated from hot hexane, dichloromethane extracts of *G. ceylanica* and 7,22-stigmastadiene-3-one (α -Spinasterone) and $11\alpha,13\beta$ -dihydroxyolean-3,12-dione isolated from hot hexane extract of *G. dassanayakei* have not been previously reported.

3β -acetoxyolean-12-ene, 3β -hydroxyolean-12-ene, 3β -acetoxyolean-12-ene-11-one and 7,22-stigmastadiene-3-ol (α -Spinasterol) isolated from the hot hexane, hot

CH₂Cl₂ extracts of the stem bark of *G. ceylanica* and *G. dassanayakei* have not been previously isolated from the Genus *Gordonia*.

The triterpenoidal glycoside Olean-12-en-3-*O*- α -D-glucopyranoside isolated from hot dichloromethane extract of *G. ceylanica*, 3,11-Dioxo-olean-12-ene, Hopane 6 α ,22-diol isolated from hot hexane extract and α -spinast-7,22-diene-3-*O*- β -D-glucopyranoside (α -Spinasterol- β -D-glucopyranoside) isolated from hot dichloromethane extract of the stem bark of *G. dassanayakei* have also not been previously isolated from Genus *Gordonia*.

Anti-fungal activity studies on stem bark extracts of *G. ceylanica* and *G. dassanayakei* showed anti-fungal activity against *Cladosporium cladosporioides* and plant pathogenic fungi such as *Curvularia* sp., *Colletotrichum gloeosporioides*, *Fusarium* sp, *Corynespora cassicola* and *Rhizoctonia solani* which cause disease to crops of economic importance to Sri Lanka. The activity-guided fractionation of hot hexane/ hot dichloromethane extract of *G. ceylanica* and *G. dassanayakei* gave many antifungal active column fractions from which a pure active compound was isolated. The ED₅₀ value of this pure compound for the above plant pathogenic fungi were determined.

Extracts of *G. ceylanica* and *G. dassanayakei* did not show antibacterial activity against *Escherichia coli*, *Streptococcus aureus* and *Staphylococcus*.