

5,7,2',4'-TETRAHYDROXYISOFLAVONE IN *MOGHANIA MACROPHYLLA*

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Moghania macrophylla (= *Flemingia macrophylla* = *F. congesta*) is one of the fifteen species belonging to the genus *Moghania* that occur in India. It is a source for the dye 'Wars' and is one of the host plants for the lac insect. Its leaves and flowers contain the chromenochalcones, flemingin-C, -D, -E and -F [1]. The present work deals with the investigation on the constituents of bark and wood. The acetone extracts of the powdered bark on usual chromatographic procedures yielded lupeol, α -amyrin and sitosterol. The methanol extract furnished sitosterol glucoside and procyanidin. The acetone and ether soluble portion of the methanolic extracts of the wood when subjected to similar chromatographic procedures, yielded in addition to lupeol, α -amyrin, sitosterol and its glucoside, a phenolic mixture, from which a major phenolic compound was isolated by PTLC. It was identified as 5,7,2',4'-tetrahydroxyisoflavone based on colour reactions, spectral data and finally comparison with a synthetic sample. No flemingin-like compounds were detected.

This is the first report of the natural occurrence of 5,7,2',4'-tetrahydroxyisoflavone. The related 5,7,2',4'-tetrahydroxyisoflavanone (dalbergiodin) is found in *Ougenia dalbergioides* [2]. This is also the first record of an isoflavone in a *Moghania* or *Flemingia* species. The genus *Moghania* is considered by Hiu-Lin Li [3] as being synonymous with *Flemingia*, but Mukerji treats them as distinct genera [4].

EXPERIMENTAL

Stem bark. The air dried powdered bark (800 g, obtained from Indian Lac Research Institute, Ranchi, India) was successively extracted with Me_2CO and MeOH (3×1000 ml). The Me_2CO extract was subjected to chromatography over Si gel. Elution with solvents of increasing polarity yielded 3 compounds identified by their spectral data and comparison with authentic samples as lupeol, α -amyrin and sitosterol. The Et_2O insoluble

portion of the MeOH extract contained procyanidin. The Et_2O soluble portion on chromatography over Si gel and elution with EtOAc, gave sitosterol glucoside.

Wood. The air dried wood chips (1 kg) were similarly extracted. The Me_2CO and Et_2O soluble portion of the MeOH extract on careful chromatography over Si gel yielded, in addition to the compounds from bark, a phenolic mixture (C_6H_6 -EtOAc, 17:3 eluates), from which a major phenolic compound was isolated (40 mg) by PTLC (CHCl_3 -MeOH, 19:1), crystallized from CHCl_3 -MeOH, mp $270-73^\circ$; R_f 0.56 (Si gel, EtOAc-petrol, 1:1). It gave greenish brown colour with alcoholic FeCl_3 . UV (MeOH): 258 and 315 (sh) nm; + AlCl_3 : 268 and 315 (sh); + AlCl_3 -HCl: 268 and 315 (sh); + NaOAc: 270; + NaOAc- H_3BO_3 : 258 nm. IR ν_{max} (KBr): 3350 (OH), 1655 cm^{-1} ($>\text{C}=\text{O}$): MS: m/e 286 (M^+ , 100%), 153 (83) and 134 (50). The acetate (Py + Ac_2O , 24 hr) mp 138° ; NMR (60 MHz, CDCl_3) of the acetate: δ 7.9 (s, 1H), 7.3 (m, 4H), 6.9 (d, $J = 3$ Hz, 1H) and four 3-proton singlets at δ 2.45, 2.4, 2.3 and 2.2 (acetoxy). These data suggested that the compound is a tetrahydroxyisoflavone. It was found to be identical with a synthetic sample of 5,7,2',4'-tetrahydroxyisoflavone prepared according to the method of Whalley [5] (mp, mmp, superimposable IR). The acetates of the natural and synthetic samples were also identical (mmp $136-8^\circ$, and IR).

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