FLAVONOIDS OF *SCOPARIA DULCIS* AND *STEMODIA VISCOSA*

In continuation of our earlier work on the Scrophulariaceae[1], we have examined the leaves of *Scoparia dulcis* and *Stemodia viscosa* whose flavonoids have not been reported earlier; our results are recorded below.

Scoparia dulcis Linn., a medicinal herb distributed throughout India[2] contains hexacosanol, β-sitostcrol and D-mannitol[3] as well as an alkaloid and triterpenoids[4].

Fresh leaves of *Scoparia dulcis* were extracted with 90% ethanol under reflux. The total extract was concentrated *in vacuo* and the aq. concentrate repeatedly shaken with petroleum ether, ether and ethyl acetate in succession. The ether fraction on concentration yielded a yellow solid; PC indicated it to be a mixture of two flavones. They were separated into individual components by repeated fractional crystallisation from MeOH–C_6H_6.

The more soluble component, needles crystallised from MeOH, m.p. 290–92°, was purple under UV and UV/NH_3, had λ_{max} 272, 333 (MeOH); 274, 304, 354 (NaOAc); 274, 324 sh 380 (NaOMe); 274, 298, 352 ($AlCl_3$) and 264 sh, 338 nm (NaOAc + H_3BO_3). On demethylation (Ac_2O + HI) it yielded scutellarein. The absence of any bathochromic shift in band II of NaOAc spectrum indicated the absence of free 7–OH-group; also the UV spectrum of the aglycone with shift reagents indicated the presence of free OH groups at C–5 and C–4′. Based on colour reactions and λ_{max}, it was identified as 7-O-methyl scutellarein and the identity was further confirmed by direct comparison with an authentic sample of 7-O-methyl scutellarein prepared by partial demethylation[5] of 7,4′-dimethyl scutellarein[1].

The less soluble component not melting below 340°, λ_{max} (MeOH) 286, 338 nm was identified as scutellarein by co-PC with an authentic sample.

The flavonoid glycoside in the ethylacetate fraction did not melt below 300° and had λ_{max} (MeOH) 286, 338 nm and on acid hydrolysis yielded scutellarein and D-glucuronic acid in equimolar ratio. It also underwent complete hydrolysis with β-glucuronidase (from bovine liver, Sigma Chemical Co., U.S.A.). It was identified as scutellarin (scutellarein-7-O-β-D-glucuronide) by direct comparison with an authentic sample.

Stemodia viscosa Roxb. an aromatic herb found in wet grounds in South India is mucilaginous and useful as demulcent[7]. On working up as before, the fresh leaves of *S. viscosa* yielded a flavone and two flavone glycosides; the flavone aglycone was identified as diosmetni (mp, mmp, UV, Rf) and the glycosides as diosmetin-7-O-β-glucuronide and luteolin-7-O-glucuronide (UV, Rf and direct comparison with authentic samples[8,9]).

7-O-Methyl-scutellarein has been earlier isolated from *Sorbaria stellipila*[10] (Rosaceae), *Galeopsis ladanum*[11] (Labiatae) and *Pleocarpus revolutus*[12] (Compositae). The present isolation of 7-O-methyl scutellarein, scutellarein and scutellarin is in general agreement with the flavonoid pattern of this family known for its 6-oxygented and methylated flavones[13].

The occurrence of luteolin and diosmetin as 7-glucuronides in *Stemodia viscosa* as well as scutellarein in *Scoparia dulcis* lends support to the earlier record of preferential occurrence of flavones as 7-glucuronides rather than 7-glucosides in certain families of the N.O. Tubiflorae[13].

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