

Flavonoids of *Ruellia prostrata* and *Barleria cristata*

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In continuation of our earlier work on the flavonoids of *Acanthaceae*¹ and the isolation of a number of flavone uronides from *Tubiflorae*², the flavonoids of *Ruellia prostrata* and *Barleria cristata* (fam. *Acanthaceae*; order *Tubiflorae*) were examined and our results are recorded below.

Fresh buds and flowers of *Ruellia prostrata* were extracted with hot 80% alcohol and the aqueous alcoholic concentrate fractionated into petrol, ether, ethyl acetate solubles and the aq. mother liquor. The ether fraction yielded small quantities of apigenin and luteolin identified by R_f and co-chromatography with authentic samples.

The EtOAc fraction was concentrated and diluted with acetone to yield a mixture of two flavone glucosides, which were separated by preparative PC and identified as apigenin-7-glucoside and luteolin-7-glucoside by m.p., $\lambda_{\max}$, R_f , products of acid hydrolysis and co-chromatography with authentic samples. The mother liquor after separation of these glycosides contained a flavone uronide, more of which was obtained from the aq. mother liquor on keeping in the ice-chest after acidification (1.5 *N*) and addition of acetone. It decomposed at 320°–25°, fairly soluble in water, sparingly soluble in alcohol and laevo-rotatory ($[\alpha]_D^{28}$ –91.2, water). It had $\lambda_{\max}$. 269, 337 (EtOH and EtOH+NaOAc); 230 sh, 275, 299, 341 (EtOH+AlCl₃). It yielded an acetyl derivative, m.p. 231°–33° and methyl ether, m.p. 221–22°. On refluxing with 10% H₂SO₄ in HOAc medium for 5 hr., it underwent hydrolysis to yield apigenin and D-glucuronic acid. It was also hydrolysed by β -glucuronidase (*pH* 5.9, 37°, 24 hr.). From the above data, the uronide was identified as apigenin-7- β -glucuronide and the identity confirmed by co-chromatography (R_f 0.65 (H₂O), 0.49 (15% HOAc), 0.83 (60% HOAc), 0.64 (BAW), 0.82 (Forestal) and 0.78 (H₂O satd. phenol) and superimposable IR spectrum with an authentic sample.¹

The flavonoids of *Barleria cristata* (violet flowers) could not be isolated owing to poor yield and were identified as apigenin, naringenin and apigenin glucuronide by R_f and co-chromatography. The anthocyanin was identified as malvidin-3,5-diglucoside as in the case of *Ruellia tuberosa*.³ *Barleria cristata* with white flowers (*Barleria cristata* L. var. *dichotoma*; syn. *B. dichotoma* Roxb.) yielded apigenin-7-glucuronide.

The occurrence of flavone uronides in *Acanthaceae* is in conformity with their presence in related families of *Tubiflorae*^{2,4}. Owing to the poor solubility in organic solvents, these water soluble uronides are not easily isolable and resist hydrolysis under normal conditions.

The conspicuous absence of any significant amount of free aglycones coupled with the difficultly hydrolysable nature of the uronides (as in the case of C-glycosides) point to the possibility⁴ of glycosylation occurring at C₁₅-intermediate stage or earlier making the intermediate more sap soluble.

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