

*Phytochemistry*, 1976, Vol. 15, p. 839. Pergamon Press. Printed in England.

# 6-GLUCURONOSYLOXYLUTEOLIN AND OTHER 6-OXYGENATED FLAVONES FROM THE LEAVES OF *STERCULIA COLORATA*

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(Received 13 October 1975)

**Key Word Index**—*Sterculia colorata*; Sterculiaceae; glucuronides of apigenin, luteolin and scutellarein; 6-hydroxyluteolin 6-glucuronide.

*Plant.* *S. colorata* Roxb. Syn. *Firmiana colorata* R.Br. [1] (Voucher specimen No. 5/75 deposited at JIPMER). *Previous work.* None.

*Present work.* Fresh leaves of *S. colorata*, collected from Annamalai University Campus, Chidambaram extracted with hot ethanol and the residue fractionated using solvents of increasing polarity. The benzene and ether extracts did not yield any crystalline solid, though the latter showed presence of flavonoids. The EtOAc and methyl ethyl ketone extracts and the aqueous mother liquor indicated the presence of 4-6 flavonoids; the major component was crystallised several times from MeOH-Me<sub>2</sub>CO mp indeterminate with darkening at 230-240°. It was dark under UV, gave a bright yellow with NH<sub>3</sub> and an olive green with Fe<sup>3+</sup>. Its solution in pyridine was laevo-rotatory and it had  $R_f$ : ( $\times 100$ , ascending 28  $\pm$  2°) 49(H<sub>2</sub>O), 6(5% HOAc), 15(15% HOAc), 49(50% HOAc), 44(BAW), 40(phenol), 59(Forestal) and 46(*t*-BAW). It had  $\lambda_{max}$ : (MeOH) 220 *sh.*, 259, 270, 352; (NaOAc) 230 *sh.*, 272, 410; and (AlCl<sub>3</sub>) 267, 278, 301, 409 nm. It did not undergo any change on heating with 1N HCl at 100° for 2 hr. However, on refluxing with 25% HCl for 3 hr. it was completely hydrolysed to yield 6-hydroxy-luteolin and D-glucuronic acid in equal proportion. Comparison of the colour reactions and the UV spectrum of the glycoside and those of 6-hydroxyluteolin, (15 nm hypsochromic shift in Band II) and its 7-O-arabinosyl(lippiflorin-A) [2], 7-O-methyl (pedalitin) [3] and 6-O-methyl (nepetin) [3] derivatives clearly showed that the glycosylation is in A ring and at C-6. Further, the glycoside was hydrolysable by  $\beta$ -glucuronidase. Hence, its structure is established as 5,7,3'-4'-tetrahydroxy-6-O- $\beta$ -D-glucuronylflavone, a compound not previously found.

The mother liquor was refluxed with 25% HCl for 3 hr. and the products examined by, PC and co-PC. D-Glucuronic acid was identified as the only sugar while the agly-

cones were characterised as apigenin, luteolin, scutellarein and 6-hydroxyluteolin and vitexin. The luteolin glycoside present originally was shown to be luteolin-7-O-glucuronide by co-PC; the probable presence of a fast moving diglucuronide of scutellarein is not ruled out from the hydrolytic products and  $R_f$  (80, in H<sub>2</sub>O).

*Comment.* This is the first report of a glucuronide of 6-hydroxyluteolin and is an interesting example of the rare glycosylation pattern involving the 6-OH as in the case of pedalitin [3], baicalein 6-O-glucoside [4] and baicalein-6-O-glucuronide [4]. This is also the first record of 6-oxygenated flavones in the Sterculiaceae, and probably the first report of the co-occurrence of a flavone-C-glycoside with flavone glucuronide. The occurrence of the 8-hydroxy flavonol, gossypetin in *Chiranthodendron pentadactylon* [5] and *Fremontia californica* [5] and 6-oxygenated flavones in *S. colorata* of the Sterculiaceae, suggesting a switch over in the A ring hydroxylation, may have significant contribution in deciding evolutionary trends [5] in this family.

*Acknowledgements*—We thank Dr. B. S. Joshi, Ciba-Geigy Research Centre, Bombay-63 for the spectral data and the Principal, JIPMER, for encouragement.

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