

## A CHALCONE GLYCOSIDE FROM THE SEEDS OF *BAUHINIA PURPUREA*

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**Key Word Index**—*Bauhinia purpurea*; Leguminosae; 3,4-dihydroxychalcone 4-*O*- $\beta$ -L-arabinopyranosyl-*O*- $\beta$ -D-galactopyranoside.

**Abstract**—A new glycoside, 3,4-dihydroxychalcone 4-*O*- $\beta$ -L-arabinopyranosyl-*O*- $\beta$ -D-galactopyranoside has been identified from the seeds of *Bauhinia purpurea*.

*Bauhinia purpurea* L. (Leguminosae, subfamily Caesalpinioideae) is of some medicinal importance [1], especially the roots and bark in the treatment of diarrhoea and its decoction is useful as a wash for ulcers. We have previously reported one new chalcone glycoside from this plant [2].

In the present study we have found another new glycoside,  $C_{26}H_{30}O_{12}$ , mp  $365^\circ$ , which gave the characteristic colour reactions of a chalcone [3–5] and gave 3,4-dihydroxychalcone [6], galactose and arabinose on acid hydrolysis (8% ethanolic  $H_2SO_4$  for 12 hr). The identity of sugars was confirmed by co-chromatography with authentic samples and by the preparation of their osazones.

The bright yellow aglycone,  $C_{15}H_{12}O_3$ , mp  $203$ – $205^\circ$  was identified as 3,4-dihydroxychalcone from its  $R_f$  values: 0.96 in *n*-BuOH–HOAc– $H_2O$  (4:1:5) and 0.72 in EtOAc–conc HCl– $H_2O$  (5:1:5) and by alkaline cleavage [7] to give the corresponding acetophenone; oxime, mp  $57^\circ$  (lit.  $59^\circ$ ); phenylhydrazones, mp  $103^\circ$ ; (lit.  $105^\circ$ ) and protocatechuic acid, mp  $190^\circ$  (lit.  $192^\circ$ ). These results indicate the presence of a 3,4-dihydroxy group in ring B which was confirmed by spectral studies.  $\lambda_{max}$  (MeOH) values were 264, 367 nm and a bathochromic shift of 78 nm on addition of NaOMe showed the presence of a free hydroxyl group at position 4. The aglycone also gave a bathochromic shift of 36 nm with NaOAc– $H_3BO_3$  indicating two free hydroxyl groups at positions 3 and 4, which were confirmed by a bathochromic shift (75 nm) of band I on the addition of anhydrous  $AlCl_3$ .

Periodate oxidation of the glycoside indicated that both sugar components of the disaccharide have the pyranose configuration, 4 mol of periodate being consumed and 2.1 mol of formic acid liberated. The sugar moiety is thought to be attached at position 4 because the aglycone gave a bathochromic shift of 78 nm while the glycoside gave no shift. On methylation of the glycoside followed by hydrolysis with Kiliani's reagent (HCl–HOAc– $H_2O$ ) (7.1:5.1), 2,3,6-tri-*O*-methyl-D-galactose and 2,3,5-tri-*O*-methyl-L-arabinose were identified in the aqueous hydrolysate. The identity of the

methyated sugars was confirmed by comparison of their RG values with 2,3,4,6-tetra-*O*-methyl-D-glucose (TMG). RG found for 2,3,6-tri-*O*-methyl-D-galactose was 0.70 (lit. 0.71) and for 2,3,5-tri-*O*-methyl-L-arabinose, 0.95 (lit. 0.96) in *n*-BuOH–EtOH– $H_2O$  (5:1:4). This result indicates that C-1 of the galactose is linked with the aglycone at position 4 and that C-4 of the galactose is linked with arabinose at position 1. The methyated aglycone was identified as 4-hydroxy-3-*O*-methoxy-chalcone which indicates that the sugar moiety is attached at position 4 of the aglycone.

Arabinose was identified in the aqueous hydrolysate obtained from partial acid hydrolysis of the glycoside with formic acid in cyclohexanol [8], while galactose was not detected. This confirms the disaccharide as an arabinosyl galactoside. Complete enzymic hydrolysis of the glycoside with emulsin indicates that both sugars are  $\beta$ -linked. Thus from the above data the chalcone is identified as 3,4-dihydroxychalcone 4-*O*- $\beta$ -L-arabinopyranosyl-*O*- $\beta$ -D-galactopyranoside.

Seeds were collected from the Department of Chemistry, University of Allahabad, India and identified by the Botanical Survey of India, Allahabad.

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