chromatographed on a column with polyamide by elution with toluene and increasing quantities of MeCOEt and MeOH. The solvents used for TLC on polyamide were (A) toluene–petrol (bp 100–140°)–MeCOEt–MeOH (30:90:2:1.5) and (B) toluene–petrol (bp 100–140°)–MeCOEt–MeOH (60:30:10:15). Prep. TLC was done on Si with solvent (C) (toluene–MeCOEt, 9:1.) A sample of dihydrowogonin (from bud exudate of sweet cherry tree [14]) was partially methylated according to Ref. [15] by addition of Me$_2$SO$_2$ to a soln in EtOH with NaHCO$_3$. The reaction product forms colourless crystals, mp 101° (lit. [9], 97°). Apigenin 7-methyl ether was identified by direct comparison with an authentic marker.

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A FLAVANONE GLYCOSIDE FROM *PRUNUS CERASOIDES*

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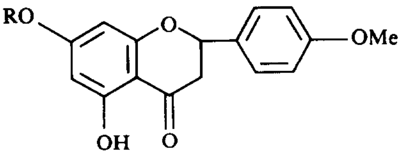
Key Word Index—*Prunus cerasoides*; Rosaceae; seeds; naringenin 4′-methyl ether 7-xyloside.

Abstract—During a phytochemical investigation of the seeds of *Prunus cerasoides*, a new flavanone glycoside, naringenin 4′-methyl ether 7-xyloside, was characterized.

Prunus cerasoides, commonly known as Padam in Hindi, is reputed to possess therapeutic value in its seeds and stem [1,2]. No previous chemical studies have been carried out on the seeds of this plant. The present paper reports the isolation and characterization of a new flavanone glycoside, naringenin 4′-methyl ether 7-*O*-*β*-D xylopyranoside (**1**) from the seeds of *P. cerasoides*.

The UV spectrum and diagnostic shifts [3] of **1** were characteristic of a 7,4′-di-*O*-substituted naringenin. **1** was confirmed as an *O*-glycoside by its ^{1}H NMR spectrum [4] in CDCl$_3$ which exhibited six aromatic protons (H-2′, H-6′, H-3′, H-5′, H-6′ and H-8), methoxyl protons and a multiplet for sugar protons along with other protons (H-2 and H-3). Acid hydrolysis of **1** with 7% ethanolic sulphuric acid yielded naringenin 4′-methyl ether (**2**) (mp, mmp, IR, UV, ^{1}H NMR, MS, co-chromatography, acetylation, demethylation) and xylose (co-PC and GLC; TMS ether). Periodate oxidation showed the consumption of 2 mol periodate with the liberation of 1 mol formic acid per 1 mol of the glycoside indicating the presence of a sugar in the monosaccharide pyranose form. **1** showed a positive bathochromic shift with aluminium



1 R = Xylose

2 R = H

chloride, indicating a free hydroxyl at C-5. Methylation of **1** followed by acid hydrolysis yielded naringenin 5,4′-dimethyl ether (mp, mmp and co-TLC), further confirming xylose at the 7-position. Hydrolysis with almond emulsin gave xylose.

EXPERIMENTAL

Isolation and purification. Air-dried and powdered seeds (2 kg) of ***Prunus cerasoides*** D. Don. from Pratap Nursery and seed stores, Dehradun (India), were exhaustively extracted ×3 with EtOH. The total EtOH extract was concd (100 ml) and poured into H_2O (500 ml). The H_2O soluble fraction was extracted with EtOAc to give **1** which was purified over a Si gel column (elution with petrol–EtOAc, 1:1) and crystallized as yellow needles from MeOH (yield 750 mg).

Naringenin 4′-methyl ether 7-O-xyloside (**1**). Mp 140–142°(*d*), $C_{21}H_{22}O_9$ ($[M]^+$ 418), (found: C, 60.28; H, 5.30; requires C, 60.30; H, 5.25%). UV λ_{max}^{EtOH} nm: 289, 325 (sh); + $AlCl_3$ 311; + NaOAc 289, 330 (sh). IR ν_{max}^{KBr} 3450 (*br*), 2900, 2868, 2850, 1680, 1601, 1500, 1470, 1380, 1300, 1270, 1170, 1125, 1030, 900, 825, 822. ^1H NMR (90 Hz, $CDCl_3$) δ 7.85 (2H, *d*, $J = 8.5$ Hz, H-2′ and H-6′); 6.94 (2H, *d*, $J = 8.5$ Hz, H-3′ and H-5′); 6.84 (1H, *d*, $J = 2.5$ Hz, H-8), 6.42 (1H, *d*, $J = 2.5$ Hz, H-6), 5.98 (1H, *d* centred at 5.25, H-2). 2.80 (*d*, $J = 17$ Hz, H-3) (eq), 3.32 (*q*, $J = 2$ Hz, H-3) (ax), 3.95 (3H, *s*, X OMe), 3.85 (*m*, sugar protons). MS at *m/z*: 418 $[M]^+$, 403 $[M - Me]^+$, 400 $[M - H_2O]^+$, 390 $[M - CO]^+$, 311 $[M - C_7H_7O]^+$, 310$[M - C_7H_8O]^+$, 123 $[M - C_{14}H_{15}O_7]^+$. TLC (Si gel R_f 0.82 (C_6H_6–EtOAc, 1:1), 0.58 ($CHCl_3$–EtOAc, 1:1). PC (Whatman No. 1) R_f 0.55 (BAW, 4:1:5), 0.20 (HOAc–HCl–H_2O, 6:1:2).

Naringenin 4′-methyl ether (**2**). Mp 193–194°, TLC, R_f 0.60 (C_6H_6–EtOAc, 1:1).

Acetylation and acetyl percentage determination of **2**. **2** (50 mg) was acetylated (Ac_2O–pyridine) by the usual method, mp 138–140°. The percentage of acetyl groups in the product was determined. (Found: COMe, 23.34%; calc. for $C_{16}H_{12}O_5$ $(COMe)_2$; 23.24%.)

Determination of the methoxyl group in **2**. The methoxyl group in **2** was determined by the method of Zeisel's as described by Belcher *et al.*[5]. (Found: OMe, 10.86%; calc. for $C_{15}H_{11}O_4$ (OMe), 10.84%.)

Enzymatic hydrolysis of **1**. **1** (20 mg) was hydrolysed with almond emulsin at 40° for 24 hr. Xylose was detected by PC.

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