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## A new constituent from *Prunus cerasoides*

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### ABSTRACT

The present study deals the isolation of a new compound from fruits of *Prunus cerasoides* and characterized as 2,4,4'-dihydroxy-6-methoxy chalcone-4-O- $[\beta$ -D-glycopyranosyl (1 $\rightarrow$ 4)]  $\alpha$ -L-rhamnopyranoside by NMR and MS data. © 2007 Trade Science Inc. - INDIA

### KEYWORDS

*Prunus cerasoides*;  
Chalcones;  
 $\alpha$ -L-rhamnopyranoside;  
Column chromatography.

### INTRODUCTION

*Prunus cerasoides* is a tree distributed in temperate Himalaya to an altitude of 1700m<sup>[1,2]</sup>. The plant is reported to be antipyretic, refrigerant and useful in asthma, leprosy and leucoderma<sup>[1,2]</sup>. The stem bark has been investigated and is found to contain sakuranetin, prunetin, genestein and genkwanin<sup>[3]</sup>. We have shown that the sapwood of plant contain some flavonoids<sup>[4]</sup> and flavanone glucoside<sup>[5]</sup>. This paper describes the isolation and characterization of a chalcone glycoside (1) from the methanolic extract of the fruits of *Prunus cerasoides*.

### EXPERIMENTAL

#### Material and Method

The Fruits of *Prunus cerasoides* were collected from Kamand (Tehri, Uttarakhand India) and authenticated by Dr.P.Uniyal, Department of Botany, Garhwal university campus, Badshahithaul, Tehri. A voucher specimen (No-121) has been deposited in the herbarium of the department.

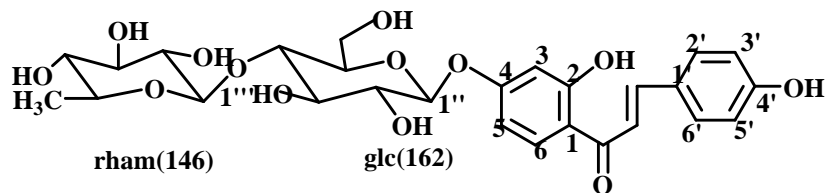
#### Extraction and isolation

Dried and powdered fruits were soxhlet-extracted with MeOH. The extract was concentrated under reduced pressure afforded a light yellow solid mass. Which on repeated column chromatography (CHCl<sub>3</sub>-MeOH) gave compound 1 (110mg). Column chromatography was carried out on Kiesel gel (230-240mesh MERK), TLC was performed on Kiesel gel 60 GC (Merk). The melting point is uncorrected. UV spectra (MeOH) were obtained Hitachi 320 Spectrophotometer. IR spectra were recorded on KBr discs (JASCO-IR-810 spectrophotometer). The <sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectra were obtained on a JEOLJNM-MH200 at 300MHz and JNM-FXFOO at 100MHz in DMSO, D<sub>6</sub> and CDCl<sub>3</sub> using TMS as internal standard (Chemical shift in  $\delta$ ppm). Mass spectra (70 ev JEOL-JMS-DX300 spectrometer) were taken with a direct inlet.

#### Acid hydrolysis of 1

Compound 1 (15mg) was hydrolysed with 7% H<sub>2</sub>SO<sub>4</sub> in MeOH at 100°C for 2hr to afford a yellow compound identified as 2, 4, 4'- trihydroxy-6-methoxy chalcone. The filtrate from the hydrolysate was neutralized with Ag<sub>2</sub>CO<sub>3</sub> and filtered, the filtrate was concentrated under reduced pressure and the residue tested

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Compound 1

for the presence of D-glucose and L-rhamnose (PC, solvent EtOAc- pyridine-H<sub>2</sub>O, 10:4:3 values 0.23 and 0.42 respectively).

### Partial hydrolysis of 1

Compound 1 (15mg) was hydrolysed with 1% MeOH- H<sub>2</sub>SO<sub>4</sub> to afford another compound. The residue obtained after neutralization and concentration of hydrolysate showed the presence of rhamnose (PC, Rf 0.42).

**Compound 1:** Crystallised from MeOH as yellow granules (110mg), mp 188-190°C, UV (MeOH) 245sh (log ε 4.25) and 364nm (4.42). IR 3400 (br), 2775 and 1685 cm<sup>-1</sup>. <sup>1</sup>H-NMR δ 7.80 (1H, d, J=16Hz), 7.75 (2H, m), 7.60 (1H, d, J=16Hz), 7.00 (2H, m), 6.50 (1H, br, s), 6.35 (1H, br, s), 3.25-5.30 (12H, m) 8.0, 7.80, 7.60 (Phenolic-OH, s) <sup>13</sup>C-NMR: 114.5 (C-1), 164.4 (C-2), 99.7 (C-3), 166.4 (C-4), 95.9 (C-5), 163.1 (C-6), 144.6 (C-α), 126.4 (C-β), 9.4 (C-1'), 132.6 (C-2'), 115.0 (C-3'), (C-4'), 115.4 (C-5'), 131.7 (C-6'), (C-O), 55.0 (OMe), Sugar carbons glc 1'' to 6'' : 102.4, 74.8, 75.0, 62.7, 78.4, 58.9, rham 1''' to 6''' : 102.2, 70.2, 81.7, 77.7, 70.0, 17.9, FAB-MS (m/z), 594 (M<sup>+</sup>), 287, 168 and 120.

## RESULTS AND DISCUSSION

Repeated column chromatography of the methanolic extract of the fruits gave a compound (1). It gave a positive FeCl<sub>3</sub> test but a negative Shinoda test suggesting the absence of a flavone or an isoflavone nucleus<sup>[6]</sup>. Its UV spectrum showed absorption bands characteristic of chalcone<sup>[7]</sup>. The IR spectrum showed characteristic absorption at 3400 (br) for a polyhydroxy system, 2775 for a methoxy group and 1645 cm<sup>-1</sup> for a conjugated carbonyl group. Acid hydrolysis of compound 1 gave an aglycone C<sub>16</sub>H<sub>14</sub>O<sub>5</sub>, which on acety-

lation with Ac<sub>2</sub>O/ pyridine, gave triacetyl derivative, m.p. 173-174°C, C<sub>26</sub>H<sub>21</sub>O<sub>8</sub>. The presence of one methoxy group was determined with the help of Zeisel's method<sup>[8]</sup>. The <sup>1</sup>H-NMR spectrum of 1 showed a methoxy group signal at δ 3.72 (br, s), a typical doublet for 4-oxygenated ring (δ 7.25, 6.80, J= 9Hz each) three one-proton signal at 8.0, 7.80, 7.60 (exchangeable with D<sub>2</sub>O) attributed to phenolic OH. The presence of AB quartet (J=16 Hz) for -HC=CH protons at 7.60-7.80, which is characteristic of ArCH=CH-CO-Ar system in chalcone<sup>[9]</sup> confirmed that 1 was a chalcone glycoside. The existence of a methoxy group on the ring was confirmed by the presence of ions at m/z 286, 168 and 120 in the EIMS of aglycone<sup>[10]</sup>.

The proton multiplets between δ 3.4-4.0 represent the position of sugar protons, whereas a singlet at 0.8 and 4.0 showed the position of α-linked rhamnose. The appearance of doublet at 5.8 (d, J=6.8Hz) further confirmed the position of β-linked anomeric proton of D-glucose. The attachment of sugar unit at C-4 was apparent from the UV spectrum of 1 which showed a bathochromic shift of 50nm with NaOMe. The <sup>13</sup>C-NMR spectrum showed twenty carbon peaks resonated at aromatic and carbohydrate region. The downfield peak at 165.0 confirmed the presence of carbonyl function, whereas the peak at 165.0 (C-4), 163.1 (C-6), 164.4 (C-2), 161.0 (C-4') substitution at these positions. The appearance of peak at δ 55.0 was assigned for the methoxy carbon atom. FAB-MS of 1 showed a molecular ion peak at m/z 599 and significant peaks at m/z 287 due to loss of one glucose and one rhamnose units, m/z 168 and 120 due to cleavage of the aglycone into two halves. Partial acidic hydrolysis (1% MeOH- H<sub>2</sub>SO<sub>4</sub>) showed the loss of rhamnose (co-PC, co-TLC). This further confirmed the linear attachment of sugar with aglycone. Thus the structure of aglycone was elucidated as 2,4,4'-trihydroxy-6-methoxy chalcone and thus that of 1, a new glycoside, 2,4'-dihydroxy-

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6-methoxy chalcone -4-O-[ $\beta$ -D glycopyranosyl(1 $\rightarrow$ 4)]  
 $\alpha$ -L- rhamnopyranoside.

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