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# A new flavanone from *Cythula tomentosa*

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**ABSTRACT**

From alcoholic extract of whole plant *Cyathula tomentosa* a new Flavanone 3'-4' dimethoxy, 5-hydroxy- 7-O-a-D-glucopyranosyl-6"-α-4"- methoxy rhamnopyranosyl Flavanone have been isolated and characterized with help of FAB-mass, $^{1}H$, $^{13}C$ NMR and 2D studies & antimicrobial activities of its extract.

**Key words:** *Cyathula tomentosa,* amaranthaceae, Flavanone, 3'-4' dimetnoxy, 5-hydroxy-7-O-α –D-glycopyranosyl-6"- α-4"- methoxy rhamnopyranosyl Flavanone.

## INTRODUCTION

*Cyathula tomentosa* (Kurru) belongs to family Amaranthaceae, is a perennial under shrub occurs throughout Garhwal Himalayas up to 600-2000 meter altitude. *Cyathula tomentosa* have been used in snake bite and has emetic properties[1] from *Cyathula capitate* and *Cyathula officinales* isolated ecdyson content is 0.046% and 0.057% respectively[2] and *Cyathula prostrata* show antifungal free redical scavenging activities 2,2-diphenyl-1-picryl hydrazyl [DPPH] radical[3]. The chemical examinants at the basis of[4] has been revieweds We found no chemical analysis from literature survey on *Cythula tomentosa*. From the ethanolic extract of *Cyathula tomentosa* a new flavanone compound is isolated. The structure of compound has been through mass, $^{1}H$, $^{13}C$. NMR and 2 D-NMR spectra.

## EXPERIMENTAL

### General

$^{1}H$-NMR at (400 MHz),$^{13}C$-NMR at (75 MHz) TMS as internal standard, using DMSO as solvent, Columan Chromatography was carried out on silica-gel 60-120 mesh (Merck). TLC was performed on percoated silica-gel. The eluting solvent was $CHCl_3$-MeOH spots were visualized by 7% $H_2SO_4$ followed by heating.

### Plant material

The whole plant of *Cyathala tomentosa* were collected from Bacchear District. Chamoli Garhwal Uttrakhand in the month of October and identified by Department Botany, P.G. College Gopeshwar where Vaucher specimen was deposited.

### Extraction and isolation

The air dried whole plant (3kg) was exhaustively extracted with 90% aqueous EtOH for 72 hours. The ethanolic extract was concentrated to dryness. The dry ethanolic extract was chromatographed over silica-gel using Methanol Chloroform (30:70) as eluting solvent which afforded the compound.

### Data

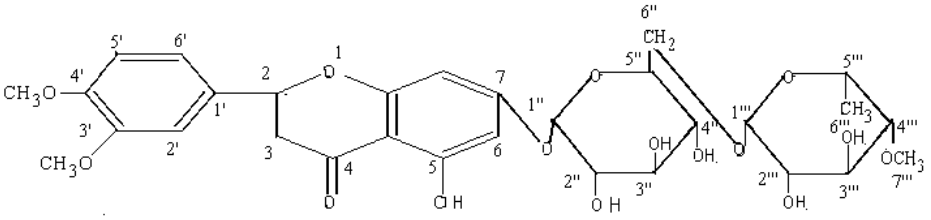
Colourless crystalline solid mp-278$^{0}$C FAB-MS- 638 $(M)^{+}$, $^{1}H$-NMR (400 MHz, DMSO) (aglycone), δ 6.07(s), 2.48 eq(m) 4.01 ax(m), 13.11(s), 6.41(s), 6.77(s), 7.19(s), 7.06(d J=6.8 Hz), 7.99(d J=7.6 Hz), 3.86 (s) (glycone) 5.28(s), 4.83(d J=9.6 Hz), 3.93(m), 3.47(m), 3.93 (m) 3.65(m) (rhamnose) δ 5.04(s), 3.38 (d J= 7.2 Hz), 3.08 (m), 3.59(m) 3.28(m), 1.19(s), (methoxy) δ 3.17(s), 5.04(s). $^{13}C$-NMR-(75MHz, DMSO) (aglycone) δ 77.7 ($C_2$), 45.8 ($C_3$), 182.7 ($C_4$), 161.7($C_5$), 97.1($C_6$), 164.6($C_7$), 92.4($C_8$), 161.1($C_9$), 104.4($C_{10}$), 137.1 ($C_{1'}$), 122.7 ($C_{2'}$) 156.6 ($C_{3'}$), 161.7 ($C_{4'}$), 116.7 ($C_{5'}$),

129.9($C_{6'}$), 55.9($C_{7}$), (glycone) δ 92.0($C_{1''}$), 73.3($C_{2''}$), 77.0($C_{3''}$), 67.7($C_{4''}$), 75.3($C_{5''}$), 67.76($C_{6''}$), (rahamnoxe) δ 92.7($C_{1'''}$), 69.6($C_{2'''}$), 70.0($C_{3'''}$), 78.7($C_{4'''}$), 64.6($C_{5'''}$), 27.7($C_{6'''}$), 54.1($C_{7'''}$).

**Result and Discussion**

It was crystallized from MeOH as colourless crystallized solid M.P.278$^0$C [appr]. On the basis of elemental analysis and its molecular formula deduced as $C_{30}O_{15}H_{38.}$ It gave positive Molish test, Shinoda test and blue color with $FeCl_3$ indicated the presence of phenolic glycoside.The molecular weight of compound was 638 amu derived from its FAB-MS, which showed molecular ion peak at m/z 638 fragment peaks 104, 132, 144, 154, 180, 192, 208 etc.

The $^1$H NMR spectrum indicated singlets at δ 6.77 and 6.41 confirmed a tetrasubstituted aromatic function and singlet at δ 6.07 assigned for H-2 and doublet at δ 4.01 for axial and multiplies at 2.4 for equitorial for H-3 of flavonone group. Another two doublets at δ 7.99 (J=7.6Hz) and 7.06 (J=6.8Hz) were assigned for H-6' and H-5' whereas a singlet at δ 7.19 revealed H-2' of trisubstituted benzene ring. The position of one singlet at δ 13.11 indicated presence of one tri-substituted hydroxyl group forming intermolecular hydrogen bond with carbonyl function and hence assigned at position C-5. Further, the sharp singlet at δ 3.86 was assignable for two methoxy group. Presence of singlet at δ 5.28 indicated anomeric singnal and doublet at δ 4.83 ( J= 9.6Hz) for H-2'' with other signals between δ 3.47-4.83 ppm for glucose and shown α- configuration. Presence of other singlet at δ 5.04 indicated anomeric signal and doublet at δ 3.38 (J= 7.2$H_Z$) for H-2''' with other signals between at δ 1.19-3.59 ppm for rhamnose also show á- configuration was shownwhich further confimed by acidic hydrolysis [7% MeOH –HCl, 10ml,60$^0$ to 80$^0$C, 8hr.] furnished aglycone [ 3', 4',dimethoxy flavone] and 4'-methoxy rhamanose and D- glucose [confirmed by Rf values (P.C) and co-TLC]. Linkage at C-1 and C-6 is confirmed by acidic hydrolysis of permethylated compound the identities of permethylated was confirmed by Rf value (P.C) and by direct comparision with authentic sample.



These value were confirmed by $^{13}$C NMR spectra which displayed 29 carbon signals. The highly downfield signals at δ 182.7 showed carbonyl signal. The downfield signals at δ 161.7, 164.6, 156.6 and 161.7 were due to oxygenated substitution. Six peaks at δ 92.0, 73.3, 77.0, 67.7, 75.3 and 67.7 were correlated with α – glucopyranoside and seven peaks at δ 92.7, 69.6, 70.0, 78.71, 64.6, 27.7, 54.1 for 4-methoxy α – rhamanopyrenoside. The signal at 78.71 for C-4''' in rhamanose shown downfield from their normal value due to presence of methoxy group at C-4'''. These values further confirmed by 2D-NMR spectra.

The compound was confirmed by the reported data of flavanone [4]. Hence it was identified as. 3',4' dimethoxy, 5 hydroxy- 7-O- α- D glucopyranosyl -6''- α-4'' methoxy rhamnopyranosyl flavanone .

**Antibacterial activities**

The compound moderately active against four bacterial cultures as *Staphylococus aureus, Staphylococus edidermidis, Klebsiella pneumoniae* and *Mycobacterium smegmatis* by use Agar well diffusion method[5].

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## REFERENCES


1. Gaur; R.D." Flora of District Garhwal" Trans Media, Srinagar Garhwal (1999).
2. Shu-Y, Zou-Z,Yang-A; *Plant Medica*, **14**: 37 (1992).
3. Cavin –A, Dyatmyko-W; Pharm.biology, **37**(4): 260 (1999).
4. Malikov V.M. andYuldashev M.P., *Khim. Prir. Soedin,* **5**: 385 (2002).
5. Cony, C.H., Lyne, M.P. and Grange, M.J., Microbiological Methods, 7th ed, Butter worth-Heinemann. Ltd, Great Britain (1995).