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"Bioactive Constituents from Swertia Cuneata"

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Abstracts

In India, SwertiaCuneata (Gentianaceae) commonly, known as Chirata is used as Crude drugs. 1,5 dihydroxy-3 8 dimethoxyxanthone has been isolated from areal parts of S. Cuneata. Besides two compounds oleanolicacid and ursolic acid have been isolated and indentified by means of chemical, I.R., ^{1}H NMR, ^{13}C NMR and Mass Spectral studies.

Introduction

Swertiacuneata (Gentianaceae) an another species of S. chirayata which grow at an altitude of 12000-17000 ft. in the glacier region of Kumaon Himalaya (Oleg. polumin et al., 1984). It is an erect herb. It was collected from Millam glaciers at an altitude of 16000-17000 ft..Swertiacuneata is used in the folk as a blood purifier, antimalarial, anti-inflammatory, febrifuge etc.

K.S. Khetwal, D.L. Verma (1990) reported chemical screening of this plant and found rich in xanthones and triterpenoids. K.S. Khetwal and SunitaPande (1997) isolated bioactive xanthones 1-hydroxy-3, 7, 8- trimethoxy-xanthone; 1, 7, 8-trihydroxy-3-methoxy-xanthone; 1,8-dihydroxy- 3,5-dimethoxy-xanthone; 1, 8-dihydroxy-3, 7-dimethoxy-xanthone along witha new xanthone glycoside, 1-glucosyloxy-3, 7, 8-trimethoxy-xanthone.However, no references regarding chemical investigation of S. cuneata exist in literature.

Plant Material

S. Cuneata was collected in the month of August – September at an altitude of 16500 ft. from Milam glaciers of Kumaon Himalaya in Uttaranchal (India). It was identified in division of Botany, CDRI Lucknow.

Experimental

Extraction and isolation - Shade dried whole plant was pulvarised and Soxhletextracted with 80% MeOH. The extract was concentrated in vaccuo and then partitioned between $CHCl_3$: H_2O (1 : 1) the $CHCl_3$ layer was separated, concentrated and the residuce was further extracted with Pet ether. (60-80°C). Elution was carriedout with Pet. Ether, benzene and ethyl acetate in different properties xanthones appeared by eluting the colours with benzene.

Seperation – Major fractions were separated in Silica gel G (Glaxo 60 × 120 mesh) CC and purified TLC and HPLC. UV spectra was recovered in MeOH with addition of NaOAC, $AlCl_3$ and HCl as required I.R. in Perkin Elmer model 298 as KBrPollets. ^{1}H NMR in and 40 MH both in CDCl3 wing TMS as internal sterol and EIMS is Jeol MS-300 instrument by direct inlet at 70.

RESULT AND DISCUSSION

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1. Molecular formula : $C_{30}H_{48}O_3$
2. Molecular Weight : 456 (M^+)
3. Melting Point : 303°C – 304°C
4. Colour Reactions :

I. It did not give Molish test for glycosides.
II. On treatment with acetic anhydride and sulphuric acid in chloroform solution it gave pink colour under UV light (365nm)
III. Chloroform solution of compound fluoresced blue green when treated with few drops of H_2SO_4, indicating the tri-terpenoid nature of the compound.
IV. Compound gave yellow colour with tetra nitromethane, indicating unsaturation in the compound.

Spectral Studies

1. **Mass Spectra :** EIMS: Molecular ion peak at456 $(M)^+$441, 438, 423, 248, 220, 219, 207, 203, 133
   Fragment Patterns - 441 [M-15], 438[M-18], 423 [M-33]
2. **I. R.Spectra :** v (KBr) cm^{-1}

v(cm^{-1})	v(cm^{-1})
3359 (OH)	1384
2943	1274
2866	1180
1691	1020
1463	

3. **^{1}H NMR Spectra:** (CDCI, and TMS as internal standard)

8(ppm)		
0.76		
0.77		
0.90		
0.91	(3H, each, s, 7 X CH,)	
0.92		
0.98		
1.13		
2.81	(1H, d, J= 4Hz, H-18)	
3.24	(1H, t, J= 5 Hz, CHOH)	
4.27	(1H, t, J= 5Hz, H-12) an olefinic proton	

4. ^{13}C NMR Spectra : ($CDCI_3$ and TMS as internal standard)

Carbon atom	**δ(ppm)**	**Carbon atom**	**δ(ppm)**

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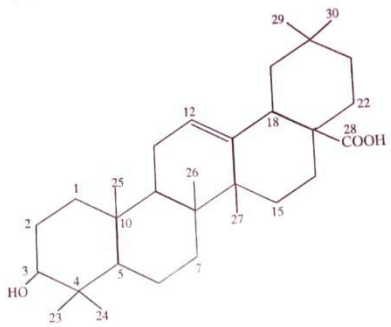
C-1	38.5	C-2	27.2
C-3	79.1	C-4	38.8
C-5	53.4	C-6	18.3
C-7	32.5	C-8	39.4
C-9	47.7	C-10	37.2
C-11	23.0	C-12	122.7
C-13	143.6	C-14	41.8
C-15	27.8	C-16	23.4
C-17	46.6	C-18	41.2
C-19	46.0	C-20	30.7
C-21	33.9	C-22	32.7
C-23	28.1	C-24	15.5
C-25	15.3	C-26	17.2
C-27	25.9	C-28	183.4
C-29	33.1	C-30	23.6

On the basis of spectral studies – ^{1}H NMR, ^{13}C NMR, I R., Mass spectra and comparing these values with literature search **compound 1** wasidentified as -**Oleanolic acid.**

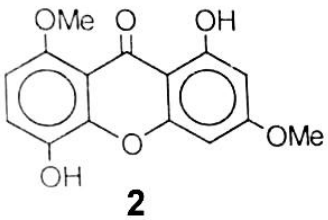
Structure



Oleanolic acid

The above **compound 1** was also identified by means of CM-MS.

In addition of this compound a new Xanthone 1, 5 dihydroxy -3, 8 – dimethoxyxanthone and 1, 8 dihydroxy -3, 5 dimethoxy-xanthones were isolated for the first time.



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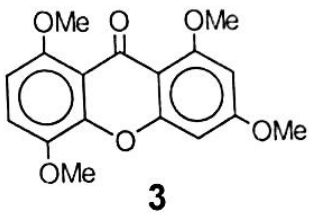

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