Asian Journal of Chemistry Vol. 22, No. 3 (2010), 2471-2473

NOTE

Phytochemical Studies on *Cissus Glauca*

G.T. Abraham and P.M. Shafi*
Department of Chemistry, Calicut University, Calicut-673 635, India
E-mail: shafimuham@rediffmail.com

Friedelin and a mixture of long chain fatty acid esters were isolated and identified from *Cissus glauca (Vitaceae)* by chemical and physical methods.

Key Words: Friedelin, Long chain esters, *Cissus glauca*, *Vitaceae*.

Cissus glauca is a handsome trailing herb which belongs to Vitaceae family[1]. It is distributed in eastern India, Maharashtra, Konkan south wards up to Kerala and the Andamans[2]. It is a slender glabrous climber. Flowering occurs mainly between August and October[3].

The paste of the root and also of the leaf is applied as a suppurate. Leaves are warmed and rubbed on the skin for skin diseases and itch[4]. The fruit is antiscorbutic, astringent, carminative, cardio tonic, cooling, emollient and is used in anorexia, colic, dyspepsia, heart diseases, thirst and ulcers. It overcome loss of appetite, indigestion, flatulence, liver and spleen diseases, cough and other respiratory disorders[5].

β-Sitosterol and leucopelargonidin have been isolated and identified earlier by Remiah *et al.*[6] from *Cissus glauca*. The present work was aimed at isolating and identifying more compounds from this plant.

Dried and finely powdered stem of *Cissus glauca* (3.5kg) was extracted with petroleum ether (60-80 c, 3 × 5 L). The combined extract was then concentrated under reduced pressure to about 500 mL of light yellow coloured solution when a white powdery solid separated out. It was filtered, washed repeatedly with petroleum ether and dissolved in petroleum ether-ethyl acetate mixture (8:1) and adsorbed on 400 g silica gel for column chromatography. The column was then eluted with solvents of increasing polarity *viz.* petroleum ether, petroleum ether-ethyl acetate (8:1), petroleum ether-ethyl acetate (5:1), petroleum ether-ethyl acetate (1:1), ethyl acetate and methanol. Several 50 mL portions were collected and each fraction was checked by TLC. Fractions 2 to 7 obtained by petroleum ether elution on evaporation gave a white powdery substance P1 (0.2 g) and it melted at 69 ºC. The extract, after the removal of white powdery solid, was also subjected to column chromatography. On elution with 8:1 petroleum ether-ethyl acetate gave a white substance, which on recrystallisation from petroleum ether-acetone (1:1) yielded 0.45 g of pure crystals P2, m.p. 245 ºC.

The IR spectrum of P1 gave characteristic absorption at 1735 cm^{-1}, indicating the presence of ester carbonyl group and other frequencies at 719 and 729 cm^{-1} are of long chain hydrocarbon part. Fragmentation pattern of the compound in the mass spectrum showed regular difference of 28 and 14 mass units proving again its straight chain hydrocarbon nature. The ^1H NMR spectrum showed a two proton triplet at δ 4.05 (–O–CH_2–CH_2–). From IR, ^1H NMR and mass spectral data, it was concluded that P1 was mixture of long chain esters.

Compound P2 responded Liebermann-Burchard reaction showing a persistent pink colour typical for triterpenes. It also gave a blue colour with vanillin-H_2SO_4 and appeared as pink spots with anisaldehyde –H_2SO_4 reagent. It gave orange colour with 2,4-dinitrophenyl hydrazine reagent, indicating the presence of carbonyl group in it. It didn't decolourize Bayers reagent, indicating saturated nature of the compound. In the mass spectrum of this compound the molecular ion appeared at m/z 426. Other important peaks are at m/z 341, 273, 205 and at 302. Its ^{13}C NMR spectrum indicated the presence of 30 carbon atoms. Presence of a carbonyl oxygen, probably that of a ketone, was evident from the IR spectrum (a strong absorption at 1714 cm^{-1}). When these data were put together the molecular formula $C_{30}H_{50}O$ is suggested. The ^1H NMR spectrum showed the presence of seven tertiary methyl groups and one secondary methyl group. Test with LB reagent was positive for a triterpenoid. So it can be concluded that the compound under investigation was a pentacyclic triterpenoid containing a keto group. From its melting point (245 ºC), molecular formula ($C_{30}H_{50}O$) and ^{13}C NMR spectrum (the compound exhibited 30-carbon resonances which compared well with the reported values of friedelin[7] [Table-1]), P2 was identified as friedelin.

TABLE-1

Carbon atom no.	^{13}C NMR shifts of the compound	^{13}C NMR shifts from literature[7]	Carbon atom no.	^{13}C NMR shifts of the compound	^{13}C NMR shifts from literature[7]
1	22.270	22.30	16	35.98	36.0
2	41.520	41.50	17	29.97	30.0
3	213.35	213.2	18	42.74	42.8
4	58.190	58.20	19	35.31	35.3
5	42.140	42.10	20	28.15	28.1
6	41.250	41.30	21	32.73	32.7
7	18.210	18.20	22	39.23	39.2
8	53.070	53.10	23	6.820	6.80
9	37.410	37.40	24	14.64	14.6
10	59.430	59.40	25	17.93	17.9
11	35.590	35.60	26	20.25	20.2
12	30.480	30.50	27	18.66	18.6
13	39.670	39.70	28	32.07	32.1
14	38.270	38.30	29	31.76	31.8
15	32.390	32.40	30	35.02	35.0

The triterpenoid compound friedelin was isolated and identified along with long chain esters from *Cissus gluaca*. *Cissus gluaca* grown in Andhra Pradesh, India had been subjected to chemical investigation by Remiah *et al.*[6]. However, they could not isolate friedelin from this plant. Presence of friedelin in *Cissus gluaca* grown in Kerala can be due to regional and climatic variations.

REFERENCES

1. V.S.Agarwal, Drug plants of India, Kalyani Publishers, Ludhiana, p. 277 (1997).
2. J.A. Parrotta, Healing Plants of Peninsular India, CABI publishers Wallingford, UK, p. 724 (2001).
3. The Wealth of India, A Dictionary of Indian Raw Material and Industrial Products, CSIR,Vol.3, New Delhi, p. 595 (1992).
4. K. Gopalakrishna Bhat, Flora of Uduppi, Published by Indian Naturalist, (Regd.), Inchara, Chitpady, Uduppi, p. 113 (2003).
5. M.P. Singh and H. Panda, Medicinal Herbs with Their Formulations, Vol. I, Daya Publishing Home, Delhi, p. 258 (2004).
6. N. Remiah, N.B.R. Prasad and P. Saradamma, *J. Indian Chem. Soc.*, **53**, 1158 (1976).
7. S.B. Mahato and A.P. Kundu, *Phytochemistry*, **37**, 1537 (1994).

(*Received*: 6 June 2009; *Accepted*: 5 December 2009) AJC-8150