Int. J. Chem. Sci.: 11(4), 2013, 1789-1792
ISSN 0972-768X
www.sadgurupublications.com

CHEMICAL COMPONENTS OF *CITRUS SINENSIS* STEMS VARIETY PINEAPPLE

SHASHI SHARMA[a] and MEERA[*]

Department of Chemistry, K. M. Govt. College, NARWANA – 126116 (Haryana) INDIA
[a]Department of Applied Science, IITT College of Engg., KALA AMB – 173030 (H.P.) INDIA

ABSTRACT

Chemical examination of *Citrus sinensis* stems variety pineapple has afforded nonacosan-15-one, β-sitosterol, epi-α-amyrin, methyl nonacosanoate and octacosanoic acid. Though this is first chemical examination of the stem yet all the five isolated compounds turn out to be known compounds.

Key words: *Citrus sinensis*, Pineapple, Rutaceae, Nonacosan-15-one, β-Sitosterol, Epi-α-amyrin, Methyl nonacosanoate, Octacosanoic acid.

INTRODUCTION

Citrus sinensis (L.) belongs to Rutaceae family, and its common names are sweet, orange and mosambi[1]. The juice flavour of its one variety resembles with that of pineapple and that is why this variety is known as pineapple. The plant is known for its medicinal values as: purgative, diuretic and laxative[2]. In view of the fact that there is no report on the chemical components of *C. sinensis* stem var. pineapple, we have taken up the present investigation.

EXPERIMENTAL

Materials and methods

C. sinensis var. pineapple stems (2 Kg) were collected from HAU, Hisar. These were chopped into small pieces. The extraction was done with hot methanol. The extractives were column chromatographed over silica gel (60-120 mesh). The elution was started with petroleum ether. Five compounds were isolated.

---

[*]Author for correspondence; E-mail: shashi.nawani@gmail.com

Melting points were ascertained on Ganson Electrical Melting Point Apparatus; ^1H NMR on Bruker AC 400 F MH_Z; IR on Perkin-Elmer Infrared Spectrophotometer; and Mass Spectra on VG 70 S 11-250 J GC-MS-DS Spectrometer.

RESULTS AND DISCUSSION

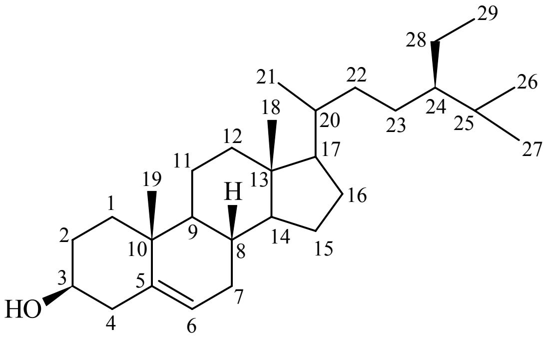
Compound A (Nonacosan-15-one)

It was obtained on elution with benzene-petroleum ether (1 : 19) as a colourless waxy solid and was crystallized from MeOH, 30 mg, m.p. 82°C (Lit. m.p. 80-81°C[3]. IR: ν (max, nujol, cm^{-1}): 1738; ^1H NMR (δ, $CDCl_3$): 2.20 (4 H, t, *J* 7.5 Hz, CH_2COCH_2), 0.95-2.00 (48 H, m, 24 x CH_2), 0.77 (6 H, t, *J* 7.5 Hz, 2 x CH_3); GC-MS (m/z, relative intensity): 418 (M^+ - 4, 38 %). The compound A was assigned structure as –

$$H_3C - (CH_2)_{12} - CH_2 - CO - CH_2 - (CH_2)_{12} - CH_3$$

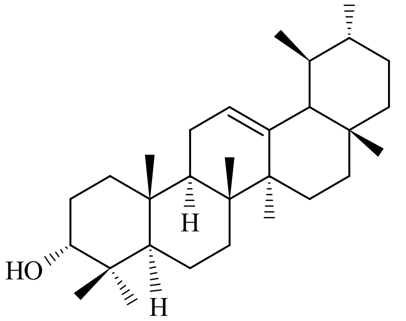
Compound B (β-Sitosterol)

It was obtained on elution with benzene – petroleum ether (1 : 9). It was crystallized from benzene as a white solid, 40 mg, m.p. 135°C (Lit. m.p. 136-137°C[4]. ^1H NMR (δ, $CDCl_3$): 5.20 (1 H, br, H-6), 5.24-4.50 (1 H, m, H-3), 2.22-1.49 (29 H, 11 x CH_2, 7 x CH), 1.18 (3 H, s, CH_3), 1.01 (3 H, d, *J* 7.0 Hz, CH_3), 0.92 (3 H, t, *J* 7.0 Hz, CH_3), 0.81 (6 H, d, *J* 7.0 Hz, 2 x CH_3); 0.77 (3 H, s, CH_3).GC-MS (m/z, relative intensity): 414 (M^+, 23). The compound B was assigned structure as –



Compound C (Epi-α-amyrin)

It was obtained on elution with ethyl acetate-benzene (1 : 3). It was crystallized from MeOH, 30 mg, 112°C (Lit. m.p. 110-111°C[5]. ^1H NMR (δ, $CDCl_3$): 0.79, 0.77, 0.76, 0.75, 0.72, 0.71 (18 H, 6 s, 6 x Me), 0.86 (6 H, d, 2 x CH_3), 2.21-1.16 (23 H, 9 x CH_2, 5 x CH), 3.45 (1 H, CH-O), 5.29 (1 H, *J* 7.0 Hz, CH); GC-MS (m/z, rel. intensity): 426 (M^+, 69). The compound C was assigned structure as –



Compound D (Methyl nonacosanoate)

It was obtained on elution with ethyl acetate-benzene (1 : 9). It was crystallized out from MeOH, 18 mg, m.p. 70°C (Lit. m.p. 68°C[6]. IR: ν (max, nujol, cm^{-1}): 1744; ^1H NMR (δ, $CDCl_3$): 3.53 (3 H, s, COOMe), 2.20 (2 H, t, *J* 7.5 Hz, CH_2COO), 1.00-1.98 (52 H, 26 x CH_2), 0.77 (3 H, *J* 7.5 Hz, CH_3); GC-MS (m/z, rel. intensity): (M^+ - 2, 67 %). The compound D was assigned structure as –

$$H_3C - (CH_2)_{26} - CH_2 - COOMe$$

Compound E (Octacosanoic acid)

The elution with ethyl acetate-benzene afforded this compound. It was crystallized out from MeOH, 12 mg, m.p. 88°C (Lit. m.p. 89-90°C[7]. IR: ν (max, nujol, cm^{-1}): 1738, 3331; ^1H NMR (δ, $CDCl_3$): 0.79 (3 H, t, *J* 7.5 Hz, Me), 1.18-2.10 (50 H, 25 x CH_2), 2.52 (2 H, t, CH_2COO); GC-MS (m/z, rel. intensity): (M^+ - 2, 67 %). The compound E was assigned structure as –

$$H_3C - (CH_2)_{25} - CH_2 - COOH$$

Though the five isolated compounds turn out to be known compounds yet the chemical components of *C. sinensis* stems var. pineapple are revealed for the first time.

ACKNOWLEDGEMENT

Authors are thankful to HAU, Hisar, for supplying the plant material and to PU, Chandigarh, for providing the spectral data.

REFERENCES

1. G. D. N. Bakshi, P. Sensarama and D. C. Pal, A Lexicon of Medicinal Plants in India, Naya Prokash, Calcutta, India, **1** (1999) p. 455.
2. G. R. Arora, L. Yadav and S. B. Kalidhar, Chemical Constituents of *Citrus Sinensis* Juice Variety Pineapple, J. Indian Chem. Soc., **88**, 1613-1614 (2011).
3. M. Macey and H. N. Barber, Chemical Genetics of Nonacosan-15-one and Related Compounds in *Brassica Oleracea*, Nature, **222**, 789-790 (1969).
4. I. Heilbron, A. H. Cook, H. M. Bunbury and D. H. Hey, Dictionary of Organic Compounds, Eyre and Spottiswoode, London, **2** (1965) p. 2902.
5. Sukhdev, Handbook of Terpenoids, CRC Press Inc. Boca. Raton, Florida, **2** (1989) p. 276.
6. E. Ahmed, A. Malik, N. Afza, N. Riaz, I. Anis, A. Sharif, S. Farheen, M. A. Lodhi and M. I. Choudhary, Chymotripsin Inhibitory Constituents from Haloxylon Recuvum, Nat. Prod. Res., **21(1)**, 69-75 (2007).
7. A. P. Tulloch and R. O. Weenink, Composition of Leaf Wax of Little Club Wheat, Canad. J. Chem., **47**, 3119-3126 (1969).

Revised : 30.08.2013 *Accepted : 31.08.2013*