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Chemical investigation of *Salvia plebeia*

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The present paper deals with Isolation, Extraction and characterization of chemical constituents obtained from Salvia plebeia. Two Aliphatic Compounds isolated from aerial parts of Salvia plebeia have been characterized as 5-ethyletracosane and 5-methylpentadecane.

Key words : Salvia plebeia.

INTRODUCTION

SALVIA plebeia R-Br belongs to family Labiateae (Lamiaceae) and is commonly known as "Bhu- Tulsi" in Hindi. The aerial parts (leaves and stem) of this plant are used as diuretic astringent and antihelmintic1.2 except isolation of salvia coccin and epoxy salvia coccin[3] (a diterpene) no detailed chemical investigation of aerial part has been undertaken earlier Alvarez *et al.* (1986). In conjugation with our previous work[4] we have isolated two aliphatic compounds from ethanolic of aerial part of Salvia plebeia.

MATERIALS AND METHODS

Isolation Of chemical constituents

Aerial part of Salvia plebeia were separated, air-dried and ground to a coarse powder (5.0 kg). It was thoroughly, extracted with hot ethanol. The extract was filtered and the solvent was removed by distillation under reduced pressure to yield a semi-solid mass (175g). This was fractionated into hexane soluble fraction (125g) and insoluble fraction (50g).

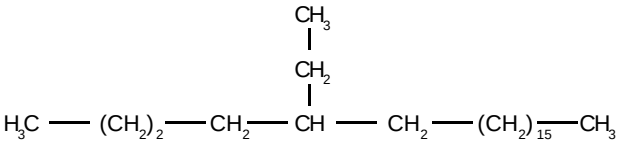
The hexane soluble fraction (125g) was chromatographed, over a column of Silica gel (2.5 kg). The column was eluted with n-hexane and n-hexane chloroform mixture (3-1). The elution of column was monitored by intermittent CO-TLC of effluent fractions (200ml) chromatographically identical fractions were mixed together. Repeated fractional crystallization led to the isolation of two solid compounds in pure forms.

Experimental

Salvia plebeia collected from near by area of Gorakhpur (U.P.) India in March 2004 was identified by Dr. S.K. Verma Department of Botany, St. Andrew's Post Graduate College, Gorakhpur (U.P.) India. All m.ps. are uncorrected. IR spectra were recorded in KBr on Perkin-Elmer-881 spectrophotometer ^{1}HNMR spectra were carried out on a Bruker. Wm instrument at 300 MHz in $CDCl_3$ with TMS as internal standard and Mass spectra were measured with JEDL high-resolution mass spectrometer. Silica Gel G (Qualigens) was used for TLC.

RESULTS AND DISCUSSION

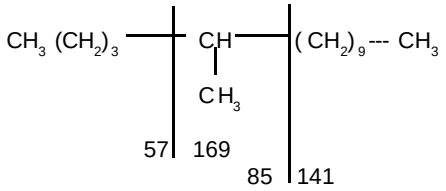
Compound 1 was isolated as white crystals m.p- 58-59^{0}c. Its mass spectrum displayed a molecular ion peak [M$^+$] at m/z 338 which suggested the molecular formula, as $C_{24}H_{50}$ It did not respond to test for unsaturation, Bands at 725cm^{-1} suggested the presence of a long aliphatic[5] chain. It was confirmed by the appearance of large number of ion peaks at a systematic interval of fourteen mass units in the mass spectrum[6]. Thus compound 1 could be inferred to be an aliphatic hydrocarbon. The ^{1}HNMR spectrum of the compound showed the signal centered at d 0.85($9H_1t$) for three methyl groups (two terminal and one side chain methyl groups). Appearance of a one proton unresolved signal at d1.40 was attributed to a methane proton suggesting the presence of side chain. A forty proton broad singlet at d 1.25 indicated the presence of twenty methylene units in identical environment. On the Basis of foregoing account compound 1 was characterized as 5-ethyl teracosane.



Compound 2 was obtained as white crystals m.p 45-46^{0}c. The molecular ion peak.[M$^+$] at .226 suggested its molecular formula as $C_{16}H_{34}$.Absorption bands at 730 and 715 cm^{-1} in IR spectrum indicated the presence of a long aliphatic chain. IR spectrum showed no other typical peak for unsaturation and functions. The peaks at m/z 169 and 85 represent. Cleavage on either side of the branch with charge retention on the substituted carbon atom. Substraction of molecular weight from the sum of these fragments accounts for the fragment –CH-CH_3. Finally the presence of a distinct M-15 peak also indicates a methyl branch.

The ^{1}HNMR spectrum of the compound showed the signal centered at d 0.8. ($9H_1t$) for three methyl groups (two terminal and one side chain methyl groups)

A twenty two proton broad singlet at d 1.25 indicated the presence of eleven methylene units in identical environment on the basis of foregoing account, compound 2 was characterized as 5- methyl pentadecane.



SPECTRAL DATA

Compound 1

Fractions of 2-11 of n hexane elute yielded a residue which was recrystallised from methanol into white crystals. (60mg) m.p 58-59^{0}C IRv (cm^{-1}) (KBr) 2820, 1475, 1250, 1085,1015, 795, 725

^{1}HNMR ($CDCl_3$) d 0.85 ($9H_1t_13CH_3)_1$1.25 (4.0 H brs, 20 CH_2) 1.40 (1 H_1urs_1-CH)

MS (m/z)(rel.int) 338[M$^+$] 3.5% 323(3.8), 309(4.7), 295(3.2) 282(2.9), 281(2.5), 255(1.9), 254(2.2), 240(1.80), 226(1.9), 184(2.4), 170 (2.5), 156 (3.9), 142 (4.9), 128 (6.9), 114 (8.5),

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100 (12.2), 86 (13.5), 72 (50.2), 71 (84), 57 (100)

COMPOUND 2

Fractions 2-8 of n-hexane-chloroform (3:1) elute offered a white mass, which was recrystallised into white crystals 75(g) m.p 45-46°C IR v (Cm^{-1})(KBr)

2850,1470, 1260, 1085, 730,715, ^{1}HNMR ($CDCl_3$)d 0.80($9H_1t_1 3CH_3$), 1.25(22H,lrs, brs HCH_2), 1.45($IHUrs_1$-CH), MS (m/z)(relint) 226 (M) (3.5%), 2H(3.8), 197(4.8), 183(4.5), 169 (3.2), 155(3.9), 141(5.7), 127(7.2), 99(11.2), 85(13.5), 71(47.8), 57(100)

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