Chemical investigation of *Salvia plebeia*

Sanjeev Kr. Tripathi, Namarta Vatsa and R. K. Asthana

1 Department of Chemistry, K.B. (P.G.) College, Mirzapur (U.P.) India
2 S.D. College of Pharmacy & Vocational Studies, Muzaffarnagar - 251 001 (U.P.) India
3 Department of Chemistry, R.S.K.D. (P.G.) College, Jaunpur - 222 001 (U.P.) India

(Accepted: February, 2006)

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 Labiataeae (Lamiaceae) and is commonly known as “Bhu-Tulsi” in Hindi. The aerial parts (leaves and stem) of this plant are used as diuretic and antihelmintic.1,2 Except isolation of salvia coccin and epoxy salvia coccin3 (a diterpene) no detailed chemical investigation of aerial part has been undertaken earlier Alvarez et al. (1986). In conjunction with our previous work4 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 (9:1). The elution of column was monitored by intermittent CO-TLC of effluent fractions (200ml) chromographically 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. H1NMR spectra were carried out on a Bruker. Wm instrument at 300 MHz in CDCl3 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°C. Its mass spectrum displayed a molecular ion peak [M]+ at m/z 338 which suggested the molecular formula, as C30H50. It did not respond to test for unsaturation. Bands at 725 cm−1 suggested the presence of a long aliphatic 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. Thus compound 1 could be inferred to be an aliphatic hydrocarbon. The 1H NMR spectrum of the compound showed the signal centered at δ 0.85 (9H, t) for three methyl groups (two terminal and one side chain methyl groups). Appearance of a one proton unresolved signal at δ1.40 was attributed to a methane proton suggesting the presence of side chain. A forty proton broad singlet at δ 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.

```
H3 \_ (CH2)_3 CH \_ (CH2)_9 \_ CH
```

Compound 2 was obtained as white crystals m.p 45-46°C. The molecular ion peak [M]+ at 226 suggested its molecular formula as C16H32. 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. Subtraction of molecular weight from the sum of these fragments accounts for the fragment –CH-CH3. Finally the presence of a distinct M-15 peak also indicates a methyl branch.

The 1H NMR spectrum of the compound showed the signal centered at δ 0.8. (9H, t) for three methyl groups (two terminal and one side chain methyl groups)

A twenty two proton broad singlet at δ 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.

```
CH3 (CH2)_3 CH \_ (CH2)_9 \_ CH
```

**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°C IRv (cm−1) (KBr) 2820, 1475, 1250, 1085, 1015, 795, 725

1H NMR (CDCl3) δ 0.85 (9H, t, 3CH3), 1.25 (4.0 H brs, 20 CH2) 1.40 (1 H, d, urs-CH3)

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),
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, 730, 715, ¹HNMR (CDCl₃) δ 0.80(9H t 1₃CH₃), 1.25(22H, brs HCH₂), 1.45(11H, brs -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)

ACKNOWLEDGEMENT

The authors are thankful to Principal K.B.P.G College, Mirzapur (U.P) India and CDRI Lucknow (INDIA) for providing laboratory and spectral analysis facilities respectively. The authors are also thankful Dr. H.S. Pandey lecturer B.P.G. College Kushinagar (U.P.) India for his valuable suggestions.

REFERENCES