

## NONPOLAR COMPOUNDS FROM *CANNA INDICA* RHIZOMES

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**Abstract.** *The hydrocarbons from petroleum ether extract of Canna indica L. (Cannaceae) were investigated by GC-MS. Results showed presence of 5, 8-henicosdiene (3.27 %), 7-henicosyne (3.70 %), 3, 15-dihydroxy-2-octadecene (45.12 %), 6-hydroxy eicosane (5.18 %), tricosane (2.40 %), and tetracosane (1.89 %).*

**Key words:** *Canna indica, Cannaceae, hydrocarbons, 3, 15-Dihydroxy-2-octadecene*

### 1. INTRODUCTION

*Canna indica* L. (Cannaceae) is commonly known as Indian shot or Canna lily. Several varieties are common all over India and are grown in gardens. It is an upright perennial rhizomatous herb up to 5 feet high, whose leaves are fleshy with thin margins, usually not more than 1 foot long and half as broad, lanceolate to sub-orbicular. The flowers are red or yellow and showy. It encloses a variable number of round, shiny black seeds. In folkloric medicine, root decoction is used for the treatment of fever, dropsy, and dyspepsia. Seed juice is used to relieve earaches. The flowers are said to cure eye diseases [1, 2]. The leaves of *C. indica* showed a significant analgesic activity and the rhizomes showed a good anthelmintic activity against *Pheritima posthuma* [3].

The purpose of the present paper is to do a qualitative and quantitative identification of nonpolar compounds from *C. indica* rhizomes.

### 2. EXPERIMENT

*Plant material.* Rhizomes of *Canna indica* L. were collected from Ahmednagar district in August 2007 and authenticated from Dr. P.S.N. Rao, Botanical Survey of India,

Pune. A voucher specimen was deposited at Botanical Survey of India, Pune. (Voucher specimen No: 63492).

*Extraction.* The plant material (100 g) was extracted by petroleum ether (60-80 °C) for 6 hours in Soxhlet extractor. The petroleum ether extract was evaporated in vacuum until a constant weight was achieved. It gave 2.44% of the residue.

*Saponification and isolation.* The petroleum ether extract (2.44 g) and 12% ethanolic solution of NaOH (45 mL) were refluxed for 2 hours on a steam bath. Water (50 mL) was added to the reaction mixture and cooled to room temperature. The part of the extract, which failed to react, was separated by extraction with a solvent ether. The evaporation of the solvent under reduced pressure afforded 0.12 g of unsaponifiable matter, which was dried in a vacuum desiccator over anhydrous CaCl<sub>2</sub> [4].

*GC/MS Analysis.* A GC/MS analysis [5] was conducted using a Shimadzu QP 5050 equipped with reference libraries using SE-52 (Mega, Legnano, Italy) cross-linked fused-silica capillary column coated with a 5% phenyl-polymethylsiloxane (25 m x 0.25 mm i.d. x 0.25 µm film thickness); column temperature, 60 °C (8 min) to 180 °C at 3 °C/min, to 230 °C at 20 °C/min. Injector temperature 250 °C; Injection mode, split; split ratio 1:40; volume injected, 0.2 µL of sample in chloroform. Helium was used as a carrier, using 122.2 kPa (51.6 cm/sec); interface temperature 250 °C; acquisition mass range 40-400.

*Identification and quantification.* The compounds were identified by comparison of fragmentation patterns in a mass spectra with those stored in databases [6]. The comparison and quantification of the components were performed on the basis of their GC peak areas.

### 3. RESULTS AND DISCUSSION

The extraction of ground dry plant material gave a 2.44% petroleum ether extract of *C. indica* rhizomes. After saponification of the extract it afforded 0.12 g of unsaponifiable matter, which was analyzed by GC-MS. The identification of hydrocarbons by GC-MS gave the results shown in Table 1.

*5, 8 Henicosdiene.* 43 (18.18), 57 (45.45), 69 (13.63), 83 (18.18), 97 (100), 111 (9.09), 123 (13.63), 137 (9.09), 179 (4.55), 292 (9.09).

*7- Henicosyne.* 43 (100), 58 (100), 71 (59.09), 85 (31.8), 95 (22.72), 109 (27.27), 124 (13.64), 292 (9.09).

*3, 15- Dihydroxy-2-octadecene.* 43 (59.09), 60 (72.72), 73 (100), 83 (27.27), 97 (22.72), 115 (18.18), 129 (50), 143 (9.09), 157 (18.18), 171 (13.64), 185 (13.64), 199 (4.55), 213 (18.18), 256 (22.72), 284 (9.09).

*6-Hydroxy eicosane.* 43 (22.72), 55 (18.18), 70 (13.64), 88 (100), 101 (54.54), 115 (4.54), 143 (4.54), 157 (13.64), 298 (9.09).

*Tricosane.* 43 (54.54), 57 (100), 71 (72.72), 85 (54.54), 99 (18.18), 113 (9.09), 127 (4.54), 324 (9.09).

*Tetracosane*. 43 (54.54), 57 (100), 71 (72.72), 85 (54.54), 99 (18.18), 113 (9.09), 127 (4.54), 338 (9.09).

Table 1. Composition of the unsaponifiable matter from *Canna indica* rhizome.

| Compound identified <sup>a</sup> | Rt (min) | % Composition | Retention Index <sup>b</sup> |
|----------------------------------|----------|---------------|------------------------------|
| 5, 8 Henicosdiene                | 15.56    | 3.3           | 1485                         |
| 7- Henicosyne                    | 16.74    | 3.7           | 1495                         |
| 3, 15- Dihydroxy-2-octadecene    | 18.23    | 45.1          | 1515                         |
| 6-Hydroxy eicosane               | 18.58    | 5.2           | 1530                         |
| Tricosane                        | 24.67    | 2.4           | 1580                         |
| Tetracosane                      | 26.60    | 1.9           | 1610                         |
| Total identified                 |          | 61.6          |                              |

<sup>a</sup>Constituents are reported according to their elution order on SE-52.

<sup>b</sup>Relative to C<sub>9</sub>-C<sub>17</sub> n-alkanes

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**NEPOLARNI SASTAV *CANNA INDICA* RHIZOMES****S.A. Nirmal, N.M. Kolhe, S.C. Pal, Subhash C. Mandal**

*Hidrokarbonati iz petroleum eter ekstrakta iz Canna indica L. (Cannaceae) su ispitivani pomoću GC-MS. Prikazani rezultati pokazuju 5, 8- hencosdiene (3.27 %), 7- hencosyne (3.70 %), 3, 15- dihydroxy-2-octadecene (45.12 %), 6- hydroxy eicosane (5.18 %), tricosane (2.40 %), and tetracosane (1.89 %).*