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# GC-MS Study of Fatty Acids, Esters, Alcohols from the Leaves of *Ipomoea carnea*

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**Abstract**: Natural products are used as traditional medicines from ancient times. They are having a great importance in Ayurveda.. One of the medicinal plant species is Ipomoea belongs to family convolvulaceae. Ipomoea species have very high medicinal value as reprted in Ayurveda. *Ipomoea. carnea*, commonly called as Mahananda in Marathi. Many industrialists of Chattisghara are using *I. carnea* along with Typha to treat polluted tanks. It was used as green manure crop in Chhattisgarh. Application of organic manure like *I. carnea* or its combination with urea was found to be superior to other green and organic manures. *I. carnea* has been used as folk medicine. Its ash is used for the treatment of skin diseases. The milky juice of this plant is used for the treatment of leucoderma. In the view of the above facts, leaves of this plant have been examined for hydrocarbons, fatty acids, esters, alcohols. The present investigation describes the occurrence of many long chain saturated and unsaturated compounds. The hexane extract contains 2.70% of oil which was studied for the first time by GC-MS, indicates presence of hydrocarbons, fatty acids, esters, alcohols. The data was confirmed by the classical fragmentation pattern, genesis. The leaves of this plant showed the presence of major thirteen compounds, which include hexadecanoic acid, stearic acid, 1,2 diethyl phthalate, n-octadecanol, octacosane, hexatriacontane, tetraacontane, 3- diethylamino-1 propanol etc.
**Key word**: *Ipomoea carnea*, hydrocarbons, fatty acids, esters, alcohols, GC-MS.

## Introduction

*Ipomoea carnea* (Mahananda in Marathi) is a native of South America and available in all states of India due to its adaptation to the Indian climatic conditions.[1] *I. Carnea* is an exotic weed in Chattisghara, India and only few decades back it was introduced as Green Manure Crop.[2] This non woody plant is cheap, representing an annually renewable source of high quality fibres that can be successfully grown in temperate and tropical climatic conditions, without requiring much attention. [1] It is frequently found in planes and low lands near water sources. [2] It belongs to convolvulaceae family and fistulosa as sub family. It is ornamental plant due to its variety of flowers, which appear pale rose, pink or light violet and whitish blue. [3] *I. carnea* has been used as folk medicine. Its ash is used for the treatment of skin disease. [4] The milky juice of this plant is used for the treatment of leucoderma in Chhattisgarh, India.[4] it is used for the treatment of polluted tanks.[4] A preliminary pharmacological study on the glycoside from the leaves of *I. carnea* is reported. [5] There are reports on synergistic effect of insecticides with plant extracts of *I.carnea* against malerial vector, Anopheles stephensi.[6] Immunomodulatory activity of aqueous extracts of *I. carnea* was tested on peritoneal cells of rat.[7] Antimicrobial activity of metal complexes prepared from the leaf proteins of *I. carnea* were reported.[8]

In the view of the above facts, leaves of *I. carnea* have been examined for fatty compounds composition. The present investigation describes the occurrence of many long chain saturated and unsaturated hydrocarbons, fatty acids, esters and alcohols. Presence of these compounds have been detected by GC-MS technique. Looking carefully at the fragmentation pattern of mass spectral data, it reveals the presence of long chain saturated / unsaturated compounds.

## Materials and Methods

The plant material was collected from river side of Pune, Maharashtra, India. It was authenticated at Botanical Survey of India, India.its authentication number is E LICAI. The air shade dried and ground material of *I. carnea* leaves (50 g) was treated with n-hexane for 48 hrs at room temperature. Solvent was removed under reduced pressure. The residue was found to be 2.7% by the weight of the dried material. The hexane extract was analyzed by GC-MS.

**GC-MS analysis:**

Gas chromatography analysis was performed by Agilent 6890N with FID using HP-5 capillary column. GC-MS analysis was performed using a Shimadzu QP 5050A mass spectrometer coupled with a Shimadzu 17A gas chromatograph fitted with a split- spiltless injector and a DB-5 fused silica capillary column (30m × 0.25mm i. d., 0.25 μm film thickness). Helium was used as a carrier gas at a flow rate of 1.0 ml/min. The injection port was maintained at 250$^{o}$C, and the split ratio was 40:1. Oven temperature programming was done from 50 to 280 $^{o}$C at 10 $^{o}$C/min, and it was kept at 280 $^{o}$C for 5 min. interference temperature was kept at 250 $^{o}$C. Ionization mode was electron impact ionization and the scanning range was from 40 amu to 400 amu. Mass spectra were obtained at 0.5 sec. interval. The spectra of the compounds were matched with NIST and Wiley library. The structures were defined by the % similarity values and confirmed by genesis. The data is incorporated in **Table no.1**.

## Results and Discussion

Thirteen compounds were identified by GC-MS. The spectra of the compounds were matched with NIST and Willey library. Their structures were identified by the % similarity values (Table). They were confirmed by the study of classical fragmentation pattern, base peak and molecular ion peaks of the compounds. The hexane extract showed the presence of N-isopropyl acrylamide (1), N-acetyl- L- alanine (2), 3-(diethylamino)-1 propanol (3), 1:3 Methoxy phenyl,1 propane (4), 6,10,14 Trimethyl , 2 pentadecanone (5), 1,2 Diethyl phthalate (6), Hexadecanoic acid (7), n- Octadecanol (8), Stearic acid (9), 4,8,12,16 Tetramethyl heptadecane-4-olide (10),Octacosane(11), Hexatriacontane (12), Tetracontane (13).

## Table -1 GC-MS Data of the compounds:

| Peak | Name of Compound | Retention time (Min.) | % Similarity | Molecular ion peak (m/z) | Base peak (m/z) |
|---|---|---|---|---|---|
| 1. | N-Isopropyl acrylamide | 6.11 | 87% | 334 | 55 |
| 2. | N-Acetyl- L-alanine | 7.20 | 82% | 87 | 44 |
| 3. | 3-(Diethylamino)-1 propanol | 9.425 | 83% | 138 | 86 |
| 4. | 1:3 Methoxy phenyl,1 propane | 10.35 | 94% | 164 | 135 |
| 5. | 6,10,14 Trimethyl , 2 pentadecanone | 12.25 | 93% | 268 | |
| 6. | 1,2 Diethyl phthalate | 12.50 | 82% | 358 | 149 |
| 7. | Hexadecanoic acid | 13.01 | 94% | 256 | 43 |
| 8. | n- Octadecanol | 13.76 | 96% | 270 | 55 |
| 9. | Stearic acid | 14.03 | 93% | 284 | 57 |
| 10. | 4,8,12,16 Tetramethyl heptadecane-4-olide | 15.9 | 92% | 324 | 57 |
| 11. | Octacosane | 19.09 | 96% | 394 | 57 |
| 12. | Hexatriacontane | 21.7 | 95% | 506 | 57 |
| 13. | Tetraacontane | 24.13 | 94% | 618 | 57 |

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