

# GC-MS Analysis of *Pentatropis Microphylla*

<sup>1</sup>\*Kalaivanan C,  
<sup>1</sup>Assistant Professor,  
Department of Chemistry,  
K. Ramakrishnan College of Technology,  
Tiruchirappalli

<sup>3</sup>Kokila S,  
<sup>3</sup>Assistant Professor,  
Department of Microbiology,  
Chennai Medical College Hospital & Research Centre  
(SRM Group),  
Tiruchirappalli

<sup>2</sup>Sundhararajan A,  
<sup>2</sup>Assistant Professor,  
Department of Biochemistry,  
Chennai Medical College Hospital & Research Centre  
(SRM Group),  
Tiruchirappalli

<sup>4</sup>Ahmed John S.  
<sup>4</sup>Professor,  
PG & Research Department of Botany,  
Jamal Mohamed College (Autonomous),  
Tiruchirappalli

## Abstract— Background

The present study was aimed to determine the presence of biomolecules in the ethanolic leaves extract of *Pentatropis microphylla*

## Materials and Methods

*Pentatropis microphylla* leaves extract was used. Gas Chromatography Mass Spectrum equipment used for identification and determine the bio active compounds.

## Results

The GC-MS results have shown the different type of secondary metabolites. A total of 28 bio active compounds were identified by GR-MS. Out of 28 compounds 2 compounds highly potent 1,6-Anhydro- $\alpha$ -D-glucopyranose (28.7332%) and Propane, 1,1,3-triethoxy (25.9192%) respectively.

## Conclusion

From the results, it is evident that *Pentatropis microphylla* contains various phytoconstituents and is recommended for further evaluation of its anti diabetic or anticancer activity.

**Key words:** *Pentatropis microphylla*, 1,6-Anhydro- $\alpha$ -D-glucopyranose, Propane, 1,1,3-triethoxy

## INTRODUCTION

Thousands of secondary plant products have been identified and it is estimated that thousand of these compounds still exist. Since secondary metabolites from natural resources have been elaborated with in living system, they are often perceived as showing more “drug-likeness and biological friendliness than totally synthetic molecules” making those good candidates for further drug development (Koehn 2005).

*Pentatropis microphylla* belongs to the family Asclepiadaceae twining, perennial herb. Leaves are 1-3.5 cm long, 0.5-2.5 cm wide broadly oblong or ovate elliptic.

Plant material – *Pentatropis microphylla* leaves was collected in Tiruchirappalli District of Tamil Nadu.

## PLANT SAMPLE EXTRACTION

The samples were cleansed through tap water and air dried at room temperature for 3 weeks and grounded into powder. The 20gm dried powder material was extracted successively using ethanol solvent to soxhlet extractor. The

crude extract was stored at 4<sup>o</sup> C until use. Take 2 mg of crude extract to dissolve 5ml of absolute alcohol for few Minutes and then filtered through Whatman filter paper No.1, before filtering, the filter paper along with sodium sulphate is wetted with alcohol. The filtrates are then concentrated by bubbling nitrogen gas into the solution and reduce the volume to 1ml. The extract contains both polar and non-polar phytoconstituents.

## GC MS ANALYSIS

GC-MS analysis was carried out on a GC Clarus 500 Perkin Elmer system comprising a AOC-20i auto sampler and gas chromatograph interfaced to a mass spectrometer (GC-MS) instrument employing the following conditions. Column Elite-5ms fusedsilica capillary column (30mmx0.25mm ID x 1 $\mu$  M df, composed 5% Phenyl 95% dimethylpolysiloxane), operating in electron impact mode at 70 eV helium (99.999%) was used as carrier gas at a constant flow of 1ml/min and an injection volume of 0.5  $\mu$  l was employed (split ratio of 10:1) injector temperature 250<sup>o</sup>C, ion source temperature 280 <sup>o</sup>C. The oven temperature was programmed from 110 <sup>o</sup>C (isothermal for 2min), with an increase of 10<sup>o</sup>C/min, to 200<sup>o</sup>C, then 5<sup>o</sup>C/min to 280<sup>o</sup>C, ending with a 9min isothermal at 280<sup>o</sup>C. Mass spectra were taken at 70 eV, a scan interval of 0.5 seconds and fragments from 45 to 450 Da. Total GC running time was 36 minutes.

## IDENTIFICATION OF ACTIVE COMPOUNDS

Interpretation on mass spectrum GC-MS was conducted using the database of National Institute Standard and Technology (NIST) having more than 62,000 patterns. The spectrum of the unknown compound was compared with the spectrum of the known compound stored in the NIST library. The name, molecular weight and structure of the compounds of the test material were ascertained.

## RESULTS AND DISCUSSION

The results were shown in Figure 1. Totally twenty eight compounds were identified in the ethanolic leaves extract of *Pentatropis microphylla* by GC-MS analysis. The

active principles were compared with standard library and identified. The active principles retention time (RT), molecular formula, molecular weight (MW) and concentration (%) are presented in the Table 1. Among the twenty eight compounds two compounds were identified as most prevailing compounds such us 1,6-Anhydro- $\alpha$ -D-glucopyranose (28.7332%) and Propane, 1,1,3-triethoxy- (25.9192%).

As many researchers reported that most of the biomolecules have anti microbial or anti diabetic activity. Since, there is no evidence or previous study conducted in this plant. Hence, the authors recommended further research to identify its anti diabetic or anti cancer activity.

Figure 1: Pentatropis microphylla Chromatogram

S.N o.	Peak Name	Retenti on time	Peak area	Peak area %
1	Ethanol, 2-propoxy- Formula: C <sub>5</sub> H <sub>12</sub> O <sub>2</sub> MW: 104	5.98	229568	1.5782
2	Vinyl Ether Formula: C <sub>4</sub> H <sub>6</sub> O MW: 70	6.58	101218	0.6958
3	Pentane, 1,1-diethoxy- Formula: C <sub>9</sub> H <sub>20</sub> O <sub>2</sub> MW: 160	6.88	224878	1.5459
4	Glycerin Formula: C <sub>3</sub> H <sub>8</sub> O <sub>3</sub> MW: 92	7.07	17364	0.1194
5	Decane, 2,5,9-trimethyl- Formula: C <sub>13</sub> H <sub>28</sub> MW: 184	7.73	190733	1.3112
6	Benzene, (1,1-dimethylethoxy)- Formula: C <sub>10</sub> H <sub>14</sub> O MW: 150	7.61	70437	0.4842
7	3,3-Diethoxy-1-propanol Formula: C <sub>7</sub> H <sub>16</sub> O <sub>3</sub> MW: 148	8.53	13328	0.0916
8	Benzeneacetaldehyde Formula: C <sub>8</sub> H <sub>8</sub> O MW: 120	8.67	87885	0.6042
9	Propane, 1,1,3-triethoxy- Formula: C <sub>9</sub> H <sub>20</sub> O <sub>3</sub> MW: 176	8.93	3770368	25.9192
10	Hexane, 1,1-diethoxy- Formula: C <sub>10</sub> H <sub>22</sub> O <sub>2</sub> MW: 174	9.20	29025	0.1995
11	Hydroperoxide, 1-methylbutyl Formula: C <sub>5</sub> H <sub>12</sub> O <sub>2</sub> MW: 104	9.83	28997	0.0031
12	4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl- Formula: C <sub>6</sub> H <sub>8</sub> O <sub>4</sub> MW: 144	10.36	61812	0.1993
13	Tridecane Formula: C <sub>13</sub> H <sub>28</sub> MW: 184	10.98	273151	0.4249
14	Salicylic acid, methyl ester Formula: C <sub>8</sub> H <sub>8</sub> O <sub>3</sub> MW: 152	11.13	1766373	1.8778
15	Pyrocatechol Formula: C <sub>6</sub> H <sub>6</sub> O <sub>2</sub> MW: 110	11.23	210483	12.1429
16	Dianhydromannitol Formula: C <sub>6</sub> H <sub>10</sub> O <sub>4</sub> MW: 146	11.50	132329	1.4470
17	Decane, 6-ethyl-2-methyl- Formula: C <sub>13</sub> H <sub>28</sub> MW: 184	14.42	348531	0.9097
18	3-Heptanone, 5-ethyl-4-methyl- Formula: C <sub>10</sub> H <sub>20</sub> O MW: 156	14.71	4179706	2.3960
19	1,6-Anhydro- $\alpha$ -D-glucopyranose (levoglucosan)	16.33	347836	28.7332

20	Formula: C <sub>6</sub> H <sub>10</sub> O <sub>5</sub> MW: 162 diol, 2,5-dimethyl- Formula: C <sub>8</sub> H <sub>18</sub> O <sub>2</sub> MW: 146	17.13	65379	2.3912
21	4-Tetradecanol Formula: C <sub>14</sub> H <sub>30</sub> O MW: 214	19.10	96666	0.4494
22	3,7,11,15-Tetramethyl-2-hexadecen-1-ol Formula: C <sub>20</sub> H <sub>40</sub> O MW: 296	21.10	547443	0.6645
23	Z-2-Dodecenol Formula: C <sub>12</sub> H <sub>24</sub> O MW: 184	21.43	137403	3.7634
24	3-Hexanol, 2,2-dimethyl- Formula: C <sub>8</sub> H <sub>18</sub> O MW: 130	22.79	567332	0.9446
25	Pentadecanoic acid, 2,6,10,14-tetramethyl-, methyl ester Formula: C <sub>20</sub> H <sub>40</sub> O <sub>2</sub> MW: 312	23.12	116017	3.9001
26	Oxalic acid, allyl pentadecyl ester Formula: C <sub>20</sub> H <sub>36</sub> O <sub>4</sub> MW: 340	24.61	122722	0.7976
27	Pentadecanoic acid, 2,6,10,14-tetramethyl-, methyl ester Formula: C <sub>20</sub> H <sub>40</sub> O <sub>2</sub> MW: 312	25.61	39941	0.8436
28	Squalene Formula: C <sub>30</sub> H <sub>50</sub> MW: 410	31.89	769226	0.2746

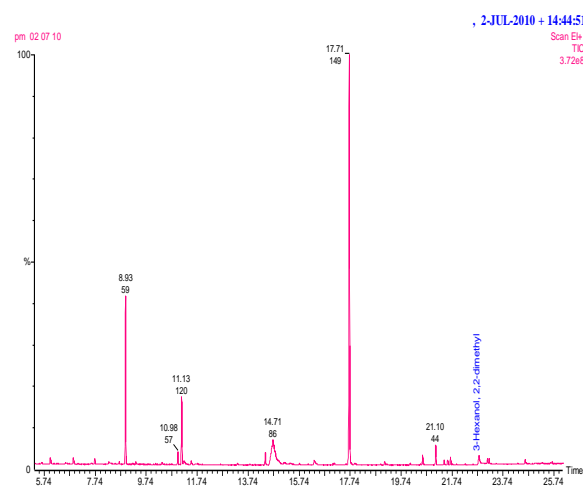


Figure 1: Pentatropis microphylla Chromatogram

## REFERENCES

- [1] Drahl C, Cravatt BF and Sorensen EJ 2005 Protein-reactive natural products. Angew Chem. Int. Ed. Engl. 44 5788-5809.
- [2] Ryu J, Kim JS, Kang SS Quality evaluation and components of *Euphoria longana*, Korean Journal of Pharmacognosy, Vol-33(3) 2002, 191-193
- [3] Sundhararajan A and Ahmed John S, Phytochemical Screening and Antibacterial Activity of *Pentatropis microphylla* against Human Pathogenic Bacteria, Journal of Eco Biology, Vol-27(1) 2010
- [4] Devi P, Nagarajan M, Christima AJM, Meera R, Merlin NJ, GCMS analysis of *Euphoria longan*, International Journal of pharmaceutical Research and development, Vol-8/OCT/004
- [5] Kirithikar KR and Basu BD, Indian medicinal plants. 2<sup>nd</sup> ed, Vol -,641