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GC - MS Analysis of Ethanolic Extract of Aerial Part *Acalypha Indica Linn*

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Abstract: ***Acalypha indica aerial part extracts were prepared in Ethanolic solvent to study the phytochemical profile using Gas Chromatography - Mass Spectrometry method. In the present study plant, 13 phytochemical constituents were identified by GC - MS chromatogram. From this study it is obvious that A. indica Aerial part extracts contains many biologically active compounds and also it gives a detailed insight about the phytochemical profile which could be exploited for the development of plant based drugs.***

Keywords: GC – MS, Ethanolic extracts, phyto compounds, *Acalypha indica*

1. Introduction

Plants are potent and powerful biochemist with number of phytochemicals incorporated that prevents and treat several disorders [1]. Traditional medicinal practitioners have been using medicinal plants and their parts as stem, leaves, bark roots, seeds etc. since long back to cure various ailments. Phytochemicals present in the plants having therapeutic benefits are considered to be "active ingredients" or "active component" of herbal medicines and provide the primary source for drug development [2]. *Acalypha indica* are used as emetic, expectorant, laxative, diuretic, bronchitis, pneumonia, asthma and pulmonary tuberculosis. The plant is traditionally used as an expectorant against asthma and pneumonia, and also as an emetic and anthelminthic [3]. In recent years secondary plant metabolites have been extensively investigated as a source of medicinal agents [4]. Today natural products derived from plants are being tested for the presence of new drugs with new modes of pharmacological action [5]. Artificial drugs have unpleasant side effects, on the other hand, the number of drug resistant micro organism is increasing, so researches are trying to pay more attention to herbal drugs [6]. The traditional medicine methods, specially the use of medicinal plants, still play a vital role to cover the basic health needs in the developing countries [7].

2. Materials and Methods

Preparation of the extract

2 µl of ethanolic extract of *A. indica* was employed for GC – MS analysis.

Instruments and chromatographic conditions

GC – MS analysis was carried out on a GC Clarus 500 Perkin Elmer system comprising a AOC-20i autosampler and gas chromatograph interfaced to a mass spectrometer (GC-MS) instrument employing the following conditions. Column Elite-1 fused silica capillary column (30 × 0.25 mm ID × IEM df, composed of 100% Dimethyl poly siloxane), operating in electron impact mode at 70 $_e$V; helium gas (99.999%) was used as a carrier gas at a constant flow of 1ml / min with an injection temperature of 250^{0}C, an injection volume of 0.5 EI employed with a split ratio of 10: 1, and ion-source temperature of 280^{0}C. The oven temperature was programmed from 110^{0}C (isothermal for 2 min), with an increase of 10^{0}C/min to 200^{0}C/min, then 5^{0}C/min to 280^{0}C/min, ending with an isothermal for 9 min at 280^{0}C. Mass spectra were taken at 70$_e$V; a scan interval of 0.5 s and fragments from 40 to 550 Da[8]

Identification of phytocompound of GC-MS

Interpretation of mass spectrum GC-MS was performed using the data base and the spectrum of the unknown components was compared with the spectrum of known components stored in the library. The name, molecular weight, and structure of the components of the test materials were ascertained. Compounds in the extract were identified using WILEY 8. LIB and NIST 145. Lin MS data library. The average peak area to the total areas was calculated for comparing relative percentage amount of each component.

3. Results and Discussion

The phytochemical components identified by GC-MS analysis of ethanolic extract of *A. indica* are shown in Table1 & Fig1. With their retention time, peak area percentage, molecular formula and probability. In the present study plant, 13 phytochemical constituents were identified by GC-MS Chromatogram. Out of which five major phytochemical constituents namely Mome inositol, ((E)-1-(tert-butyldimethlysilyl-4,4-dimethyl-2-penten-1-one, 2,3-Dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one, Cytidine (CAS) and 3-Phenyl-1, 2-pyrazole were found in abundance with peak area % ranged between 2.83 and 47.29. These phytoconstituents were found to show the retention time between 7.01 and 29.12.

GC-MS is a method that combines the features of Gas-Liquid Chromatography (GLC) and Mass Spectrometry (MS) to identify different substances within a test sample. The phytochemical compounds present in the selected plant extract were identified by GC-MS analysis. GG-MS chromatogram of the ethanolic extract of *Acalypha indica* showed the presence of 13 phytochemical constituents (Table 1; fig.1).

The major phytochemical compounds identified were mome inositol with peak area % of 47.29% followed by €-1-(tert-

butyldimethyly1)-4, 4-dimethyl 1-2-penten-1-one (11.57%). The occurrence of various components in GC-MS analysis and their biological activities were studied in *Pulicaria odoara*, *Staphylea* Species, *Macfadyena unguis-catic*, *Pterocarpus marsupium*, *Tabebuia rosea* and *Cassia italica*.[9,10,11,12,13,14]. The presence of various bio active compounds in the ethanolic extract of *A calypha indica* shown by the GC-MS analysis represented the phytopharmaceutical importance of the present study plant.

Table 1: GC-MS analysis of ethanolic extract of *Acalypha indica*

S. No.	Compounds	Retention Time (Min.)	Peak Area %	Molecular Formula	Probability
1.	Phenyl Methylhydrazino N-sulfamoylisosemicarbazide	4.27	0.49	$C_8H_{12}N_4O_3S$	11.51
2.	3-Phenyl-1,2-pyrazole	7.01	2.83	$C_9H_8N_2$	44.17
3.	2,3-Dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one	11.12	3.51	$C_6H_8O_4$	92.77
4.	(E)-1-(tert-butyldimethylsilyl)-4,4-dimethyl-2-penten-1-one	12.46	11.57	$C_{13}H_{26}OSi$	7.79
5.	Thiophene, 2-propyl- (CAS)	13.86	2.71	$C_7H_{10}S$	36.97
6.	dimethyl citraconate	15.45	0.80	$C_7H_{10}O_4$	63.32
7.	Cytidine (CAS)	21.07	3.36	$C_9H_{13}N_3O_5$	12.47
8.	3-Oxo-20-methyl-11-à-hydroxyconanine-1,4-diene	24.11	1.84	$C_{22}H_{31}NO_2$	18.74
9.	Mome inositol	29.12	47.29	$C_7H_{14}O_6$	87.19
10.	Hexadecanoic acid, 2,3-dihydroxypropyl ester CAS)	33.33	1.52	$C_{19}H_{38}O_4$	40.44
11.	9,12,15-Octadecatrienoic acid, (Z,Z,Z)-	33.72	1.82	$C_{18}H_{30}O_2$	44.43
12.	4-cyanomethylquinoline	35.11	1.15	$C_{11}H_8N_2$	41.75
13.	Di-(2-ethylhexyl)phthalate	40.07	0.51	$C_{24}H_{38}O_4$	51.57

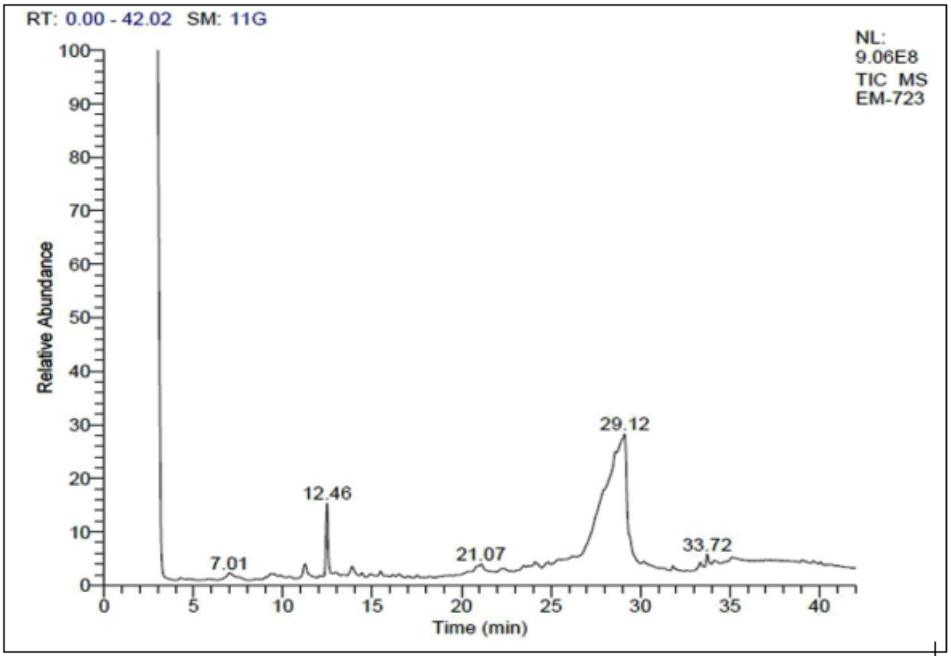

Figure 1: GC-MS chromatogram of ethanolic extract of *Acalypha indica*

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