Available online www.jocpr.com

Journal of Chemical and Pharmaceutical Research, 2017, 9(1):27-30

Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Gas Chromatography-Mass Spectrum Analysis of Bioactive Components of the Ethanolic Extract of *Hyptis suaveolens* Linn (Poit)

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ABSTRACT

Hyptis suaveolens Linn (poit) is traditionally used for treating different ailment. The present investigation was carried out to determine the possible chemical component from Hyptis suaveolens Linn (poit) by GC-MS Technique. GC-MS play a key role in the analysis of unknown component of plant origin. GC-MS produce positive identification and qualification of phytoconstituents. From GC-MS analysis, More than 25 different phyto constituents were identified in ethanolic extract of the tested plant.

Keywords: Gas chromatography; Mass spectrum; *Hyptis suaveolens*

INTRODUCTION

Globally, about 85% of the traditional medicines used for primary healthcare are derived from plants. India is one of the twelve mega –biodiversity countries of the World having rich vegetation with a wide variety of plant with medicinal value. In many countries, scientific investigations of medicinal plants have been initiated because of their contribution to healthcare. Traditional medicine and ethno botanical information play an important role in scientific research, particularly when the literature and field work data have been properly evaluated [1].

Herbal medicines have good values in treating many diseases including infectious diseases, hypertension, etc. That they can save lives of many, particularly in the developing countries, is undisputable [2].

Herbal drugs obtained from plants are believed to be much safer; this has been proved in the treatment of various ailments. In the last few years GC-MS has become firmly established as a key technological platform for secondary metabolite profiling in both plant and nonplant species.

The present investigation has been undertaken to find out the phytoconstituents from the ethanol extract of *Hyptis suaveolens* (L.) poit leaves using GC-MS analysis.

The plant, *Hyptis suaveolens* (L) Poit commonly known as *Wilayati tulsi* belongs to the family Lamiaceae and is an ethno botanically important medicinal plant. The plant has been considered as an obnoxious weed, distributed throughout the tropics and subtropics.

Almost all parts of this plant are being used in traditional medicine to treat various diseases. The leaves of *H. suaveolens* have been utilized as a stimulant, carminative, sudorific, galactogogue and as a cure for parasitic cutaneous diseases [3]. Crude leaf extract is also used as a relief to colic and stomach-ache.

Leaves and twigs are considered to be antispasmodic and used in antirheumatic and antisuporific baths [4], an anti-inflammatory, antifertility agent [5], and also applied as an antiseptic in burns, wounds, and various skin complaints. The decoction of the roots is highly valued as appetizer and is reported to contain urosolic acid, a natural HIV-integrase inhibitor [6].

EXPERIMENTAL SECTION

Collection of plant materials

Fresh leaves of *hyptis suaveolens* (L.) Poit were collected from kannukudi, Thanjavur (DT), Tamilnadu, India. They were identified by Dr.S.John britto, The Director the Rapinet herbarium St.Joseph's college, Thiruchirapalli and a voucher specimens were deposited in the Rapinet herbarium of st.Joseph's college, Thiruchirapalli (Figure 1).

Preparation of powder

The leaves of plants were dried under shade. Dried leaves were mechanically powdered sieved using 80 meshes and stored in an air tight container. The powdered materials were used for further GC-MS analysis.

Sample preparation

Weighed 5 g of sample and add 100ml of Ethanol soaking overnight keep in shaker for one hour. Filter the sample with whatman No.1 filter paper; concentrate the extract to 1ml at 40^{o}C. The concentrated extract was diluted to 5ml and injects 1ml of the extract in GC- MS.

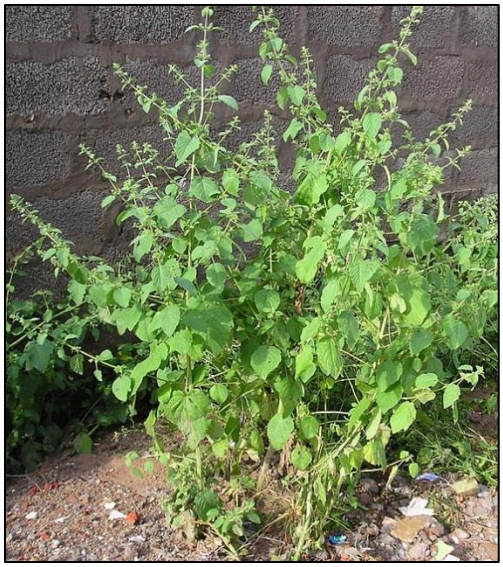

Figure 1: Pictorial Representation of *Hyptis suaveolens* (L.)Poit

Analysis of plant extract

Plant powder extracted with ethanol and analyzed for different components present in the Ethanolic extract of the sample using GC-MS was carried out at Indian Institute of Crop Processing Technology (IICPT), Thanjavur, and Tamilnadu. GC-MS analysis of the extract as performed using a Perkin Elmer GC Claurus 500 system and gas chromatograph interfaced to a Mass spectrometer equipped with elite-1 fused silica capillary column (30m×1µl was Mdf .composed of 100% Dimethyl polysiloxane. For GC-MS detection an electron ionization energy of 70ev was used. Helium gas (99.999%) was used as the carrier gas at a constant flow rate of 1ml/min and an injection volume of 2µl was employed, injector temperature was 250^{o}C. The oven temperature was programmed from 110^{o}C (isothermal for 2min), with an increase of 10^{o}C/min to 200^{o}C then 5^{o}C/min to 280^{o}C ending with a 90min isothermal at 280^{o}C. Mass spectra were taken at 70eV a scan interval of 0.5 Second and fragment from 45 to 450Da. The relative percentage amount of each component as calculated by comparing its average peak area to the total areas. Software adopted to handle mass spectra and chromatogram as a Turbo mass Ver. 5.2.0.

RESULT AND DISCUSSION

In table 1 and figure 2 shows the phytoconstituent of ethanolic extract of *Hyptis suaveolens L*inn (poit) which was identified using GC-MS. GC-MS play a key role in the analysis of unknown components of plant origin. GC-MS produce positive identification and qualification of phytoconstituents. The active principle molecular weight(Mw), concentration(%), molecular formula, Retention Time(RT) were presented in Table 1.It shows 25 compounds. This include Eucalyptol ($C_{10}H_{18}O$) 0.44%, Bicyclo[4.1.0]-3-heptene, 2-isopropenyl-5-isopropyl-7,7-dimethyl- (C15H24)

0.07, Cyclobutaneacetonitrile, 1-methyl-2-(1-methylethenyl)- (C10H15N) 0.05, Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-,[1R-(1R*,4Z,9S*)]- (C15H24) 2.44, 1,3,6,10-Dodecatetraene, 3,7,11-trimethyl-, (Z,E)- (C15H24) 0.30, 1,3,7-Octatriene, 3,7-dimethyl- (C10H16) 0.10, Adamantane, 1-(2-bromoethenyl)- (C12H17 Br) 0.15, 1,9-Decadiyne (C10H14) 0.03, Squalene (C30H50) 6.47,etc.

Table 1: Components identified in ethanol extract of *Hyptis suaveolens* Linn (poit) by GC-MS Analysis

No.	RT	Name of the compound	Molecular formula	MW	Peak Area %
1	2.49	Eucalyptol	C10H18O	154	0.44
2	6.11	Bicyclo[4.1.0]-3-heptene, 2-isopropenyl-5-isopropyl-7,7-dimethyl-	C15H24	204	0.07
3	6.27	Cyclobutaneacetonitrile, 1-methyl-2-(1-methylethenyl)-	C10H15N	149	0.05
4	6.68	Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-,[1R-(1R*,4Z,9S*)]-	C15H24	204	2.44
5	6.78	1,3,6,10-Dodecatetraene, 3,7,11-trimethyl-, (Z,E)-	C15H24	204	0.3
6	7.12	1,3,7-Octatriene, 3,7-dimethyl- [Synonyms: Ocimene]	C10H16	136	0.1
7	7.42	Adamantane, 1-(2-bromoethenyl)-	C12H17Br	240	0.15
8	7.54	1,9-Decadiyne	C10H14	134	0.03
9	8.67	1-Methylene-2b-hydroxymethyl-3,3-dimethyl-4b-(3-methylbut-2-enyl)-cyclohexane	C15H26O	222	0.27
10	9.85	1,3,6-Heptatriene, 5-methyl-	C8H12	108	0.07
11	11.25	3,7,11,15-Tetramethyl-2-hexadecen-1-ol	C20H40O	296	3.63
12	11.51	1-Octadecyne	C18H34	250	0.62
13	13.43	Phenanthrene, 7-ethenyl-1,2,3,4,4a,5,6,7,8,9,10,10a-dodecahydro-1,1,4a,7-tetramethyl- [Synonyms: Pimara-8,15-diene #]	C20H32	272	2.06
14	13.95	7-Isopropyl-1,1,4a-trimethyl-1,2,3,4,4a,9,10,10a-octahydrophenanthrene	C20H30	270	1.24
15	14.35	8a(2H)-Phenanthrenol, 7-ethenyldodecahydro-1,1,4a,7-tetramethyl-, acetate, [4as-(4aà,4bá,7á,8aà,10aá)]-	C22H36O2	332	0.59
16	14.5	Phytol	C20H40O	296	1.19
17	17.4	(3,7-Dimethyl-octa-2,6-dienyl)-benzene	C16H22	214	4.33
18	17.54	Methyl palustrate isomer	C21H32O2	316	37.51
19	18.14	1-Phenanthrenemethanol, 1,2,3,4,4a,9,10,10a-octahydro-1,4a-dimethyl-7-(1-methylethyl)-, [1S-(1à,4aà,10aá)]-	C20H30O	286	13.2
20	18.66	Methyl abietate	C21H32O2	316	4.72
21	24.1	Squalene	C30H50	410	6.47
22	25.76	1H-3a,7-Methanoazulene, octahydro-1,4,9,9-tetramethyl-	C15H26	206	2.84
23	31.46	(E,E,E)-3,7,11,15-Tetramethylhexadeca-1,3,6,10,14-pentaene	C20H32	272	4.92
24	32.46	Urs-12-en-24-oic acid, 3-oxo-, methyl ester, (+)-	C31H48O3	468	7.55
25	34.3	Testosterone Propionate	C22H32O3	344	5.22

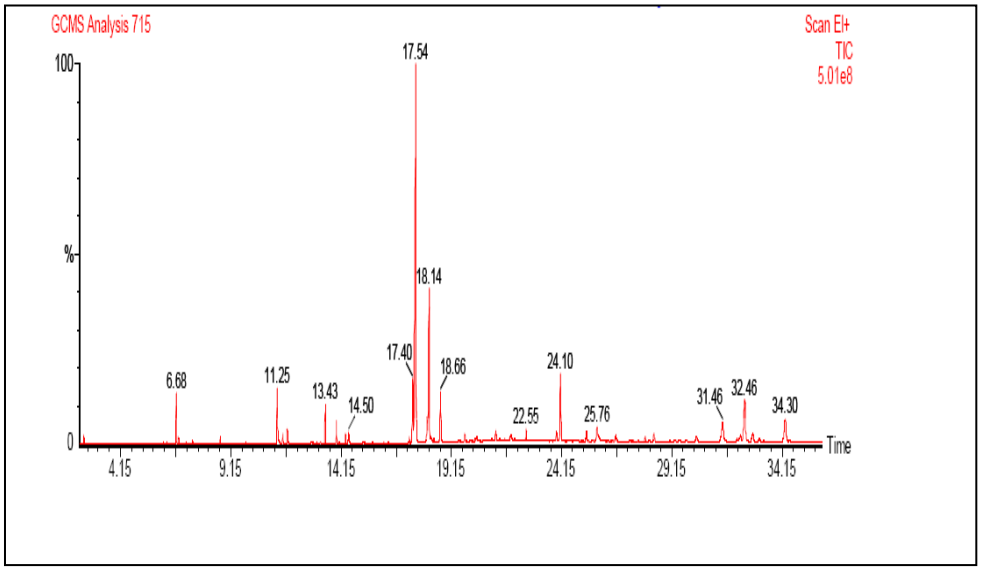

Figure 1: GC-MS chromatogram of *Hyptis suaveolens* Linn. (Poit) ethanolic extract

CONCLUSION

GC-MS analysis is a direct and fast analysis approach for identification of secondary metabolites and only few grams of plant material is required. The present study which reveals the presence of components in *hyptis suaveolens* Linn (poit) Suggests that the contribution of these compounds on the pharmacological activity should be evaluated.

ACKNOWLEDGEMENT

Authors acknowledge the valuable help rendered by Dr.V.Dhivakaran, Managing Trustee, STET Women's College, Mannargudi.

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