© IJCIRAS | ISSN (O) - 2581-5334
July 2018 | Vol. 1 Issue. 2

GC-MS ANALYSIS OF EXTRACT OF ACACIA LEUCOPHLOEA PLANT

U.S. Khandekar

Department of Industrial Chemistry, Arts, Commerce and Science College, Kiran Nagar, Amravati, 444606, Maharastra, India

Abstract

On comparison of the Gas Chromatograph-Mass Spectra of the Methanolic extract of Acacia Leucophloea with the NIST & WILEY libraries, major bioactive chemical constituents found in the extract are listed in the result. It shows the presence of nearly forty constituents which includes flavonoids, tannins, terpenoids, phytosterols etc. which have medicinal values and importance.

Keyword: Phytochemicals, methanolic, screening, phytoconstituents.

1.INTRODUCTION

Acacia Leucophloea belongs to subfamily Mimosoideae of the family Fabaceae having common name HIWAR. Its leaves, tender shoots, and pods are readily consumed by goats, sheep and cattle. Traditionally, parts of this plant are used against diarrhoea, cancer, inflammation, ophthalmia, hemorrhoid, leprosy, bleeding piles, and leucoderma problems. Its young leaves and pods are used as an astringent. The leaves are believed to possess hypotensive, depressent, antisyphilitic and antimicrobial principles, while the gum possesses demulscent properties [1]. *Acacia Leucophloea* bark has a foul smell and its fibers are used to make fish nets and rough rope. The bark yields water soluble gum of fair quality [2]. Bark is used to purify liquor and yields a reddish-brown stain which is used for the preparation of dyes. Moreover, the bark is used against snake bites [3,4]. Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defense mechanism and protect from various diseases. Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds [5]. Terpenoids exhibit various important pharmacological activities i.e., anti-inflammatory, anticancer, anti-malarial, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities [6]. Terpenoids are very important in attracting useful mites and consume the herbivorous insects [7]. Alkaloids are used as anaesthetic agents and are found in medicinal plants[8].

2. MATERIAL AND METHOD

2.1. Collection of plant material

The fresh leaves of *Acacia Leucophloea* plant were collected from Melghat region Dist-Amravati (Maharashtra). The experimental site is located between coordinates 20.91° N, 77.75°E and an altitude of 342 m in foothills of Central India experiencing the subtropical climate during winter season in the month Feb 2017. Authentication of plant was confirmed by botanist (Dr.S.K Tippat, Department of Environment Science, Art, and Commerce & Science College Amravati).

2.2. Sample Preparation

The plant of *Acacia Leucophloea* firstly dry at room temperature after drying the sample get grind with the help of mixer. Then to prepare plant extract of methanol with the help of soxhlet apparatus at 62^0C. After extract preparation the extract were filter with the help of Whatman filter paper no.1.and reduce the sample to dry and stored in refrigerator.

3. PHYTOCHEMICAL ANALYSIS (Qualitative analysis)

Phytochemical screening of methanolic extract of *Acacia Leucophloea* plant is found to contain various phytoconstituents like Alkaloids, Flavonoids, Tannins, Terpenoids, Phytosterols, Cumarine, Glycosides etc. [9,10,11].

3.1. GC-MS Analysis of Acacia Leucophloea

3.1.1. Gas Chromatography

Gas Chromatography of the plant extract was carried out on a Shimadzu (GC) Gas Chromatography model QP2010S equipped with direct injector and split ratio set to 10:1. (DB-5) (5% phenyl polysioxane, 30m length 250u internal diameter; 0.25um film coating) fused capillary column. Helium was the carrier gas at 1.0 ml min. The oven temperature program was programmed to start at 35 ° hold for 2 min then temp at 20 ^{0}c per min to 300 ^{0} c and hold for 5 min. Injector and detector temperature were 220 ° c and 230° c respectively .Injection size was 0.02 ul neat.

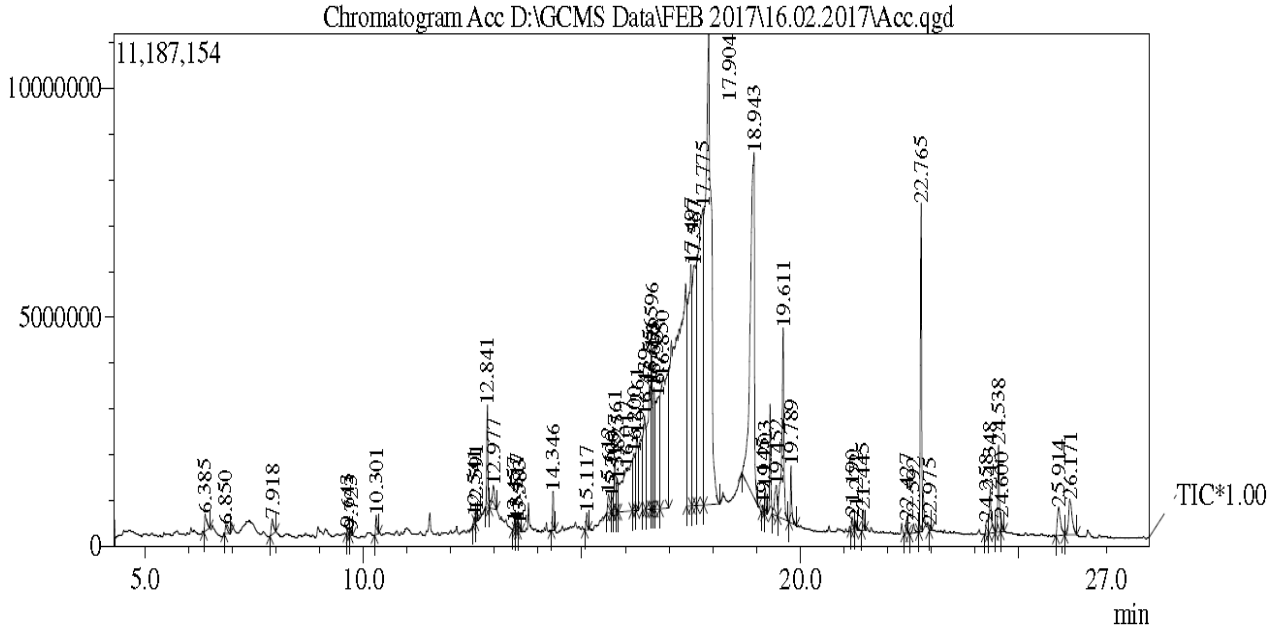

Fig 1. Gas Chromatogram of Methanolic extract of Acacia Leucophloea plant.

3.1.2. Identification of chemical constituents

Identification of the chemical constituents was done on the basis of retention index (RI) using a mass spectra library search NIST & WILEY and by com-paring the mass spectral and retention data with literature [12]. The relative amounts of individual components were calculated based on the GC peak area (FID response) without using a correction factor. The result is listed in table no. 1.

Table No 1 : Chemical Composition of *Acacia Leucophloea* Plant

Peak	**R.Time**	Area	**Area %**	Height %	**Name**	**Base m/z**
1	6.385	1282116	0.28	0.44	5H-1,4-Dioxepin, 2,3-dihydro-2,5-dimethyl-	58.00
2	6.850	543083	0.12	0.21	Ethyl trans-3-methyl-2-oxiranecarboxylate	45.00
3	7.918	1231880	0.27	0.40	4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl-	43.00
4	9.643	218254	0.05	0.16	3-Acetyl-2-octanone	43.00
5	9.723	178685	0.04	0.13	Tetradecane	43.00

6	10.301	992065	0.21	0.50	2-methoxy-4-vinylphenol	150.05
7	12.541	251259	0.05	0.17	1,4-dimethylpiperazine	43.00
8	12.591	327017	0.07	0.26	Octadecane	57.05
9	12.841	3892251	0.84	2.66	Phenol, 2,4-bis(1,1-dimethylethyl)-	191.10
10	12.977	2366231	0.51	0.61	2,3-dihydroxycyclohexanone	57.00
11	13.457	282013	0.06	0.17	Dodecanoic acid	60.00
12	13.517	455488	0.10	0.27	4-methyl-2,5-dimethoxybenzaldehyde	180.10
13	13.583	421771	0.09	0.14	Fumaric acid, ethyl 2-methylallyl ester	127.05
14	14.346	1466582	0.32	1.01	Megastigmatrienone 2	133.10
15	15.117	759000	0.16	0.44	Docosane	57.05
16	15.612	1461288	0.32	0.47	4-((1E)-3-Hydroxy-1-propenyl)-2-methoxyphenol	137.05
17	15.700	837639	0.18	0.38	.beta.-k-Strophanthin	87.05
18	15.761	3425028	0.74	1.43	Tetradecanoic acid	60.00
19	15.825	1941413	0.42	0.80	3-(3-Oxo-tetrahydro-pyran-2-yl)-propionic acid, methyl	154.10
20	16.017	15688070	3.39	1.12	(-)-Loliolide	43.00
21	16.200	5963967	1.29	1.49	Salicin	124.10
22	16.261	5124224	1.11	1.97	3-heptadecanol	59.05
23	16.439	8212189	1.77	2.44	Isopropyl myristate	43.00
24	16.556	14079519	3.04	3.24	2-methyl-2-(4h-1,2,4-triazol-4-ylamino)propanenitrile	124.10
25	16.596	8562917	1.85	4.16	Neophytadiene	68.05
26	16.653	7430683	1.60	3.14	2-Pentadecanone, 6,10,14-trimethyl-	43.00
27	16.733	16737972	3.61	2.88	Mome inositol	73.05
28	16.850	33563628	7.25	3.40	(E)-phytol	57.00
29	17.497	35495269	7.66	6.28	Hexadecanoic acid, methyl ester	74.05
30	17.567	31054004	6.71	6.22	Cyclohexanone, 2,6-bis(2-methylpropylidene)-	91.05
31	17.775	59705134	12.89	7.72	3-ethyl-3-undecanol #	87.05
32	17.904	93269047	20.14	12.22	N,n-bis(2-hydroxyethyl)dodecanamide	73.05
33	18.943	50921175	10.99	8.97	Alpha.-d-glucopyranoside, methyl	60.00
34	19.145	265218	0.06	0.18	Methyl octadeca-9,12-dienoate	67.05
35	19.203	882413	0.19	0.66	9,12,15-octadecatrienoic acid, methyl ester	79.05
36	19.452	2694697	0.58	0.79	Undecanoic acid	73.05
37	19.611	14885684	3.21	4.96	9,12,15-Octadecatrienoic acid, (Z,Z,Z)-	79.05
38	19.789	2569853	0.55	1.48	Octadecanoic acid	43.05
39	21.190	654732	0.14	0.32	9-Octadecenoic acid (Z)-, phenylmethyl ester	91.05
40	21.272	360223	0.08	0.24	5,5-Diethylheptadecane	57.05

4. RESULT AND DISCUSSION

Phytochemical evaluation is to confirm the presence of various chemical constituent present in plant. Due to higher polarity of methanolic extract it revealed the presence of maximum phytochemical composition especially flavonoids, tannins, coumarines and glycosides. These phytoconstituents independently responsible for the broad range of medicinal properties.

GC-MS chromatogram analysis of the Methanolic extract of *Acacia Leucophloea* Fig.1 shows 40 peaks which indicating the presence of various phytochemical constituents. On comparison of the mass spectra of the constituents with the NIST & WILEY libraries. Some major chemical constituents listed below with their nature and biological applications. The various phytoconstituents which contribute to the medicinal activities like antimicrobial, antioxidants. Anti-inflammatory, pesticide, antipyretic and xenobiotics.

5. CONCLUSION

The presence of various bioactive compounds in the *Acacia Leucophloea* justifies the use of whole plant for various ailments by traditional practitioners. This study determined that Methanolic extract of leaves of *Acacia* plant species showed better antioxidant potential by DPPH radical scavenging method when compare to standard ascorbic acid. But *Acacia Leucophloea* extract showed minimum active in antimicrobial activity. It offers many opportunities to investigate the various functions and prospects in pharmaceutical studies. It is believed that a detailed information as presented in this review on its phytochemistry and various biological properties of the extracts and the constituents might provide incentive for proper evaluation of the use of the plant in medicine and in Food Science. Further work, however, still needs to be carried to reveal the structure activity relationship of these active constituents. Outcome of the future research in the aforementioned areas will provide a convincing support for the future clinical uses of *Acacia Leucophloea* in modern medicine and as flavoring ingredients.

6. ACKNOWLEDGEMENT

I wish to acknowledge Narsamma's Arts, Commerce and Science College Kiran nagar Amravati, for availing all facilities required for this research.

REFERENCES

[1] C.P. Khare, Indian medicinal plants, an illustrated dictionary, Springer, Stuttgart, 2007.
[2] R.S. Troup, Troup's silviculture of Indian trees, Leguminosae, Forest Research Institute and Colleges, Dehradun, India, 1983.
[3] Z.E. Selvanayagam, S.G. Gnavavendhan, K. Balakrishna, R.R. Bhima, S.A. Usman, Survey of medicinal plants with anti snake venom activity in Chengalpattu district, Tamilnadu, India, Fitoterapia, (66) 1995.
[4] B.M. Walter,M.C. Nascimento,B.M. Pereira, N.A. Pereira, Plant natural products active against snake bite, the molecular approach, Phytochemistry, (55) 2000.
[5] D. Krishnaiah, R. Sarbatly, A. Bono, Phytochemical antioxidants for health and medicine: A move towards nature. Biotechnol Mol Biol Rev, (1) 2007.
[6] S.B. Mahato, S. Sen, Advances in triterpenoid research, Phytochemistry, (44) 1997.
[7] I.F. Kappers, A. Aharoni, T.W. Van Herpen, L.L. Luckerhoff, M. Dicke M, Genetic engineering of terpenoid metabolism attracts bodyguards to Arabidopsis. Science, 2005.
[8] D. Hérouart, R.S. Sangwan, M.A. Fliniaux, B.S. Sangwan-Norreel, Variations in the Leaf Alkaloid Content of Androgenic Diploid Plants of Datura innoxia. Planta Med., (54) 1988.
[9] I.B. Harborne, Phytochemical methods: A guide to modern techniques of plant analysis. Edn 2, Chapman and Hall, New York, 1973.
[10] A. Sofowara, Medicinal Plants and Traditional Medicine in Africa. Spectrum Books Ltd., Ibadan, Nigeria, 1993.
[11] W.C Evans, G.E Trease, Texebook of Pharmacognosy. 11th ed. Macmillian Publishers. Braillllar Tiridel Canada, 1989.
[12] P.Abirami, A.Rajendra GCMS analysis of methanol extract of *Vernonia cinera*, European Journal Experiment biology, 2(1), 2002.