GC-MS ANALYSIS ON ETHANOLIC FLOWER EXTRACT OF *LITSEA FLORIBUNDA* (BLUME) GAMBLE.

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ABSTRACT

The present study is carried out to explore the phytoconstituents present in the ethanolic extract of whole plant *Litsea floribunda* (Blume) Gamble. Plants are a rich source of secondary metabolites with interesting biological activities. In general, these secondary metabolites play an important source with a variety of structural arrangements and properties. The ethanolic extract of the whole plant of *Litsea floribunda* is used for the GC- MS analysis. The compounds are identified by the gas chromatography coupled with the mass spectrometry. The molecular weight and structure of the compounds of test materials are ascertained by interpretation of the mass spectrum of GC- MS. GC- MS analysis of *Litsea floribunda* reveal the presence of the nine biological active compounds which include cis- sabinol, 5-methylene-3-cyclooctene-1,2-di, 1,2-benzoldi carbonsaeure, Pentadecanoic acid, Tetratriacontane, Hexadecanoic acid, 1,2-Benzenedicarboxylic acid, dibutyl ester, Octadecanoic acid, stearic acid. The results specify that the ethanolic extract of the whole plant, *Litsea floribunda* contains various bioactive compounds and therefore has various medicinal properties which can be used for the treatment of various diseases.

key words : Bioactive ,Chromatography, Metabolities, Phytoconstituents and Spectrometry.

INTRODUCTION

In developing countries, communities rely heavily on traditional herbal medicines in order to meet their primary health care needs. In many industrialized countries herbal medicines are gaining popularity as alternative and complimentary therapies (Koduru *et al*., 2006). Nature, an important source of medicinal agents since ancient period which help human in ailment of

diseases. Herbal drugs from plants have been in use in many parts of the world to fight against diseases. Many of these drugs are commonly used even today (Sabir *et al*., 2007).

Plants are a rich source of secondary metabolites with interesting biological activities. In general, these secondary metabolites are an important source with a variety of structural arrangements and properties (de-Fatima *et al*., 2006). Plants have been utilized as a wide source for discovering novel drug or compounds. Now a day's medicines obtained from different parts of the plant have made huge contributions towards human health and well-being (Rout and Kar, 2013).

The role of World Health Organization (WHO) is to encourage, promote and facilitate the effective herbal medicine for the primary use in developing countries for different health programs. Different biological activities like anti- microbial, anti- oxidant, sedative and anxiolytic effects of the plant extracts may be due to presence of the active compounds. Consequently, due to some other biological activities on the same time make excellent leads for new drug development (Keshari, 2011).

GC-MS is the best technique to identify the bioactive constituents of long chain hydrocarbons, alcohols, acids, esters, alkaloids, steroids, amino, nitro compounds (Karuppasamy *et al*., 2012). Nowadays, the study of the organic compounds from plants and their activity has increased. The combination of a best separation technique (GC) with the best identification technique (MS) made GC-MS an ideal technique for qualitative analysis for volatile and semi-volatile bioactive compounds (Grover and Patni, 2013).

Litsea floribunda (Blume) Gamble leaves are used as one of the ingredients in the preparation of herbal shampoo, in Southern India (Girish *et al*., 2014). In the health traditions, the local inhabitants use *litsea floribunda* to treat certain gastrointestinal and respiratory disorders. Till now, no data are available on the phytochemical profile, antioxidant and hepatoprotective potentials of the species. Hence the present work was carried out the bioactive compounds in the selected plant *Litsea floribunda.*

MATERIALS AND METHODS

Collection of the plant materials:

Figure -1

Litsea floribunda (Blume) Gamble was collected from Kothagiri. It is in Nilgiri district of Tamil Nadu. It is the oldest and 3rd largest hill station in the Nilgiris. It has an average elevation of 1847 metres. It is surrounded by beautiful wilderness, misty medows and several waterfalls. It's a mesmerising beautiful hill.

Sample extraction

Dried powdered material of *Litsea floribunda* is subjected to the solvent extraction for 16 hours with the solvents of increasing polarity such as petroleum ether, chloroform, ethyl acetate, ethanol and water. 50 g of dried plant powder is extracted in 250ml of each solvent and kept in a shaker for 72 hrs. Extraction is repeated with the same solvent till the clear colourless solvent is obtained. Each time before extracting, with the next solvent the residue is dried thoroughly to remove the solvent used. Finally the extract is evaporated and stored at 0-4^{o} C in an air tight container for further use.

GC- MS analysis

The ethanolic extract of the whole plant of *Litsea floribunda* (Blume) Gamble. is used for the GC-MS analysis. 2µl of the ethanolic extract of the whole plant of *Litsea floribunda* is dissolved in HPLC grade methanol and subjected to GC-MS. JEOL GCMATE II GC-MS (Agilent Technologies 6890 N Network GC system for gas chromatography). The column (HP5) is fused silica 50m x 0.25 mm I.D. Analysis conditions are 20 min, at 100^{o} C, 3 min at 235^{o} C for column temperature,240^{o} C for injector temperature, helium is the carrier gas and split ratio is 5:4. The sample (1µl) is evaporated in a split less injector at 300^{o}C. Run time is 22 min. The compounds are identified by the gas chromatography coupled with mass spectrometry. The molecular weight and structure of the compounds of test materials are ascertained by the interpretation of mass spectrum of GC-MS. The mass spectrum of the unknown component is compared with the spectrum of the known components (Gnanavel and Mary Saral, 2013).

RESULT AND DISCUSSIONS

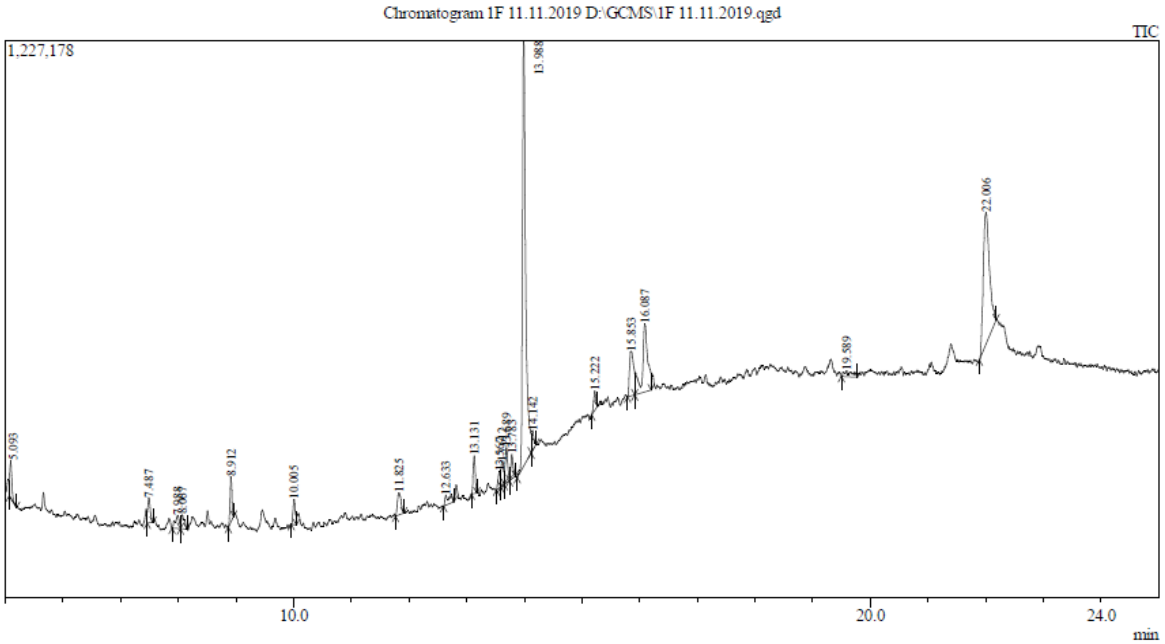
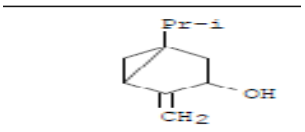
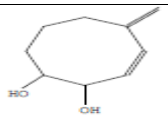
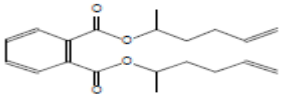


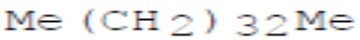
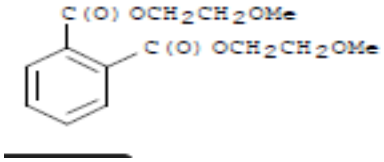
Figure 2: GC-MS Chromatogram of the ethanolic extract of *Litsea floribunda*.

Table-1 Phytocomponents identified in the ethanolic extract of *Litsea floribunda*(Blume) Gamble.

Compound name	Molecular formula	Molecular weight	Retention time
CIS – SABINOL	$C_{10}H_{16}O$	152	5.093
5 - METHYLENE -3-CYCLOOCTENE -1, 2-DI	$C_{15}H_{24}$	204	7.988
1,2- BENZOLDI CARBONSAEURE, DI- CHE.	$C_{20}H_{26}O_4$	330	10.005
Pentadecanoic acid	$C_{15}H_{30}O_2$	242	11.825
Tetratriacontane	$C_{34}H_{70}$	479	13.567
Hexadecanoic acid	$C_{16}H_{32}O_2$	256	13.988
1,2- Benzenedicarboxylic acid, dibutyl ester.	$C_{16}H_{22}O_4$	278	14.142
Octadecanoic acid ,Stearic acid .	$C_{18}H_{36}O_2$	284	16.087
7-Hepta decene, 17-chloro-	$C_{17}H_{33}CL$	272	15.22

Table -2. Biological activity of identified compounds of *Litsea floribunda*

S.No.	Compound name	Biological activity	Structure
1	CIS – SABINOL	Antioxidant	
2	5 - METHYLENE -3-CYCLOOCTENE -1, 2-DI	Antifungal & Antibacterial	
3	1,2- BENZOLDI CARBONSAEURE, DI-CHE.	Antidiabetic	

4	Pentadecanoic acid	Anti-inflammatory activity	
5	Tetratriacontane	Antioxidant	
6	**Hexadecanoic acid**	**Antibacterial**	
7	1,2- Benzenedicarboxylic acid, dibutyl ester.	Antioxidant & Antidiabetic	
8	Octadecanoic acid ,Stearic acid .	Antitumor activity	
9	7-Hepta decene, 17-chloro-	Anticancerous	

GC-MS method is used to identify phytoconstituents in a direct and fast analytical approach with few grams of plant material. The GC-MS analysis of ethanol flower extract of *Litsea floribunda* has revealed the presence of nine compounds and most of the reported. There are cis- sabinol, 5-methylene-3-cyclooctene-1,2-di, 1,2-benzoldi carbonsaeure, Pentadecanoic acid, Tetratriacontane, Hexadecanoic acid, 1,2-Benzenedicarboxylic acid, dibutyl ester, Octadecanoic acid, stearic acid. In these compounds obtained, some components were biological

activities of antioxidant, antifungal, antibacterial, anti-inflammatory, antidiabetic, antitumor, and anticancerous.The identified compounds of the ethanol flower extract of *Litsea floribunda*, their retention time, molecular formula, molecular weight, and structure are given in the table 1and 2.

Mohammad (2016) explains the medicinal importance of *Azadirachta indica* (Neem) as follows: anti- inflammatory, hepatoprotective, wound healing effect, antidiabetic activity, antinephrotoxicity, anti microbial, immunomodulatory growth promoting effect. Hexadecanoic acid, methyl ester is used as antioxidant, anti-inflammatory possess hypolipidemic properties and is also used as an antimicrobial agent (Hema *et al*., 2011). 13- Octodecanoic acid methyl ester is used as fatty acids, which selectively inhibit eukaryotic DNA polymerase activities *in vitro* (Yoshiyuki *et al*., 1996). 9- Octadecanoic acid(Z)- methyl ester has antioxidant activity, is anticarcinogenic; used as dermatitigenic flavour and exists in human blood and urine where it serves as endogenous peroxisome proliferator activated receptor ligand. 9- Octadecanoic acid, methyl ester (E) posses antioxidant properties and anti cancerous activities. Methyl stearate is used as solvents or cosolvents and oil carrier in agricultural industry (Syeda *et al*., 2011).

CONCLUSION

The urge in research on new drugs from natural sources is now moving out of the herbalists shop and shifting to drug research laboratories. India is a home to a variety of traditional medicine systems that rely to a very large extent on native plant species for their raw drug materials (Ranjithakani *et al*., 1993). The results of the study clearly indicate the presence of active principles with the pharmacological activities in the ethanolic flower extract of *Litsea floribunda* (Blume) Gamble. So, this can be effectively used to treat diseases like cancer, diabetis, mellitus, arthritis and inflammation.

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