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GC- MS determination of bioactive components of *Eugenia singampattiana* Bedd

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Abstract: *Eugenia singampattiana* Bedd known to the *Kanikkars* as "Kattukorandi" is an important medicinal plant. The *Kanikkar* tribe, inhabitants of Agasthiarmalai Biosphere Reserve, Western Ghats, Tamil Nadu, India use this plant to relief from asthma, giddiness, body pain, rheumatism and gastric complaints. The present investigation deals with GC-MS analysis of ethanolic extract of the above said plant. Eighteen compounds were identified.
Key Words: GC-MS analysis, *Eugenia singampattiana.*

Introduction

Eugenia singampattiana Bedd belong to the family Myrtaceae. It is commonly known as "Kattukorandi" in *Kanikkar* tribals of Agasthiarmalai, Biosphere Reserve, Western Ghats, Tamil Nadu, India. The paste prepared from the leaf of *Eugenia singampattiana* is given in asthma and giddiness. Paste prepared from equal quantity of leaves and flowers is consumed by *Kanikkar* tribals to cure body pain and throat pain. Paste prepared from equal quantity of leaves, flowers and tender fruits are consumed by the *Kanikkars* to relief from leg sores and rheumatism. Paste prepared from equal quantity of stems, leaves and flowers is consumed with palm sugar to get relief from gastric complaints[1]. Perusal of literature reveals that information on the chemical analysis of *E. singampattiana* is totally lacking. Several species of this genus are extensively used in traditional medicine for treating various ailments. The present communication deals with the GC –MS analysis of ethanolic extract of *Eugenia singampattiana* leaf.

Materials and Methods

Plant material

The leaves of *Eugenia singampattiana* Bedd were collected from the well grown healthy plants inhabiting the natural forests of Karaiyar, Agasthiarmalai Biosphere Reserve, Western Ghats, Tamil Nadu. The leaf samples were air dried and powdered. Required quantity of powder was weighted and transferred to stopper flask and treated with the ethanol until the powder is fully immersed. The flask was shaken every hour for the first 6 hours and then it was kept aside and again shaken after 24 hours. This process was repeated for 3 days and then the extract was filtered. The extract was collected and evaporated to dryness by using a vacuum distillation unit. The

final residue thus obtained was then subjected to GC-MS analysis.

GC- MS analysis

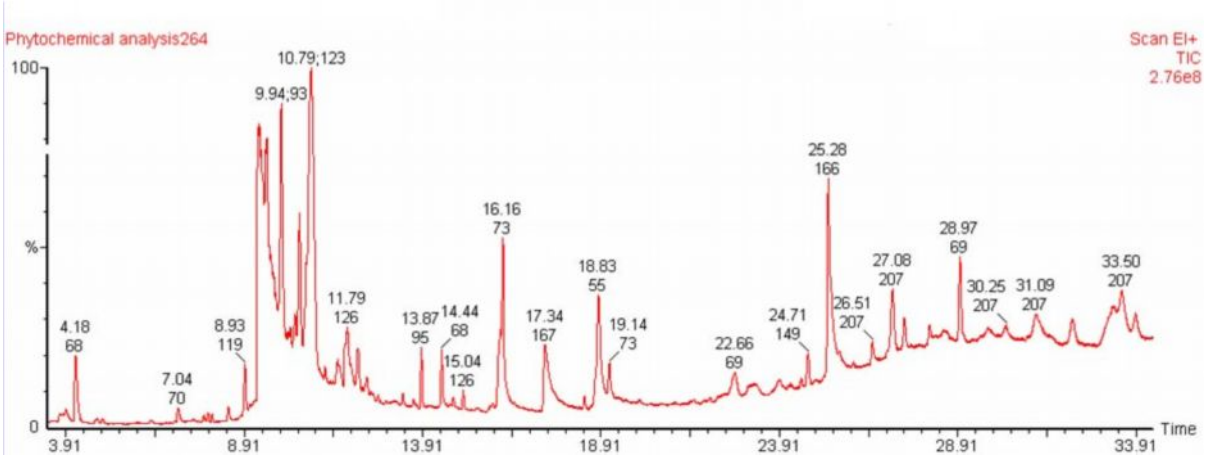
GC–MS was analysis was carried out on a GC Clarus 500 Perkin Elmer system comprising a AOC-20i autosampler and gas chromatograph interfaced to a mass spectrometer (GC-MS) instrument employing the following conditions: column Elite-1 fused silica capillary column (330mm x 0.25mm ID x 1µm df, composed of 100% Dimethyl poly siloxane), 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 0.5µl was employed (split ratio of 10:1) injector temperature 250°C; ion-source temperature 280°C. The oven temperature was programmed from 110°C (isothermal for 2 min), with an increase of 10°C/min, to 200°C, then 5°C/min to 280°C, ending with a 9 min isothermal at 280°C. Mass spectra were taken at 70 eV; a scan interval of 0.5 seconds and fragments from 40 to 550 Da.

Identification of Components

Interpretation of 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 component was compared with the spectrum of the known components stored in the NIST library. The name, molecular weight and structure of the components of the test materials were ascertained.

Table 1. Components detected in *Eugenia singampattiana* leaf extract

No.	RT	Name of the compound	Molecular Formula	MW	Peak Area %	Compound Nature
1	4.18	Limonene	$C_{10}H_{16}$	136	2.12	Monoterpene
2	7.04	2-Undecene, 2,5-dimethyl-	$C_{13}H_{26}$	182	0.42	Alkane compound
3	8.93	Copaene	$C_{15}H_{24}$	204	1.09	Sesquiterpene
4	9.31	1,2,3-Benzenetriol [Synonyms: Pyrogallol]	$C_6H_6O_3$	126	17.93	Pyrogallol
5	9.94	à-Caryophyllene [Synonyms: Humulene	$C_{15}H_{24}$	204	9.42	Sesquiterpene
6	10.45	Azulene, 1,2,3,4,5,6,7,8-octahydro-1,4-dimethyl-7-(1-methylethenyl)-, [1S-(1à,4à,7à)]- [Synonyms: à-Guaiene]	$C_{15}H_{24}$	204	3.23	Sesquiterpene
7	10.79	5-Methoxy-2,2,6-trimethyl-1-(3-methyl-buta-1,3-dienyl)-7-oxa-bicyclo[4.1.0]heptane	$C_{15}H_{24}O_2$	236	19.63	Alkane compound
8	11.79	Cyclohexanone, 2,2-dimethyl-5-(3-methyloxiranyl)-, [2à(R*),3à]-(.+-.)-	$C_{11}H_{18}O_2$	182	3.61	Ketone compound
9	13.87	3,7,11,15-Tetramethyl-2-hexadecen-1-ol	$C_{20}H_{40}O$	296	1.07	Terpene alcohol
10	16.16	n-Hexadecanoic acid	$C_{16}H_{32}O_2$	256	8.14	Palmitic acid
11	17.34	2-Pentanone, 1-(2,4,6-trihydroxyphenyl)	$C_{11}H_{14}O_4$	210	5.65	Ketone compound
12	18.45	Phytol	$C_{20}H_{40}O$	296	0.26	Diterpene
13	18.83	9,12-Octadecadienoic acid (Z,Z)-	$C_{18}H_{32}O_2$	280	6.13	Linoleic acid
14	19.14	Octadecanoic acid	$C_{18}H_{36}O_2$	284	1.97	Stearic acid
15	25.28	2-Propen-1-one, 1-(2,6-dihydroxy-4-methoxyphenyl)-3-phenyl-, (E)- [Synonyms: Pinostrobin chalcone]	$C_{16}H_{14}O_4$	270	9.02	Ketone compound
16	27.08	5H-Benzo[b]pyran-8-ol, 2,3,5,5,8a-pentamethyl-6,7,8,8a-tetrahydro-	$C_{14}H_{22}O_2$	222	2.55	Benzo compound
17	28.97	Squalene	$C_{30}H_{50}$	410	2.68	Triterpene
18	33.50	à-Amyrin	$C_{30}H_{50}O$	426	5.05	Triterpene



Fig–1 GC-MS Chromatogram of the ethanolic extract of *Eugenia singampattiana* leaf .

Results

The results pertaining to the GC-MS analysis are given in Figure 1 and Table 1. Eighteen compounds were detected in ethanolic extracts of *Eugenia singampattiana* leaf. The results revealed that 5-Methoxy-2,2,6-trimethyl-1(3-methyl-buta-1,3-dienyl)-7-oxa-bicyclo (4.1.0) heptanes (19.63%) was found as major compound followed by1,2,3-Benzenetriol (17.93%), α-caryophyllene (9.42%), 2-propen-1-one, 1-(2,6-dihydroxy-4-methoxyphenyl)-3-phenyl, (E) - (9.02%), n-Hexadecanoic acid (8.14%), 9,12-Octa decadienoic acid (Z,Z)-(6.13%), 2-pentanone, 1-(2,4,6-trihydroxyphenyl) (5.65%) α-Amyrin (5.05%), squalene (2.68%) and limonene (2.12%) were found as the major compounds in the ethanolic extract of *E. singampattiana* leaf.

Discussion

In the present study, 18 compounds have been identified from ethanolic extract of the leaf of *Eugenia singampattiana* by Gas chromatography- Mass spectrometry (GC-MS) analysis. Among the identified phytochemicals, n -Hexadecanoic acid and squalene have the property of antioxidant activity. 9-12, Octadecadienoic acid (Z, Z) have the property of anti-inflammatory and antiarthritic as reported by the earlier worker[2]. Limonene is currently undergoing testing in cancer patients[3]. It is a monoterpene that has antitumoral, antibiotic and antiprotozoal activity[4]. Recently squalene possesses chemopreventive activity against colon carcinogenesis[5]. α-caryophyllene is a sesquiterpene that has anti-inflammatory activity[6]. α–Amyrin is a triterpene which exhibited potential antifungal activity[7].

Thus, this type of GC-MS analysis is the first step towards understanding the nature of active principles in this medicinal plant and this type of study will be helpful for further detailed study. Further investigations into the pharmacological importance of *Eugenia singampattiana* and their diversity and detailed phytochemistry may add new knowledge to the information in the traditional medical systems.

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