

**‘GAS CHROMATOGRAPHY MASS SPECTROSCOPIC ANALYSIS OF
EVOLVULUS NUMMULARIUS’**

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ABSTRACT

GC MS analysis study was conducted to learn about the types of molecules present in one herbal medicinal plant, *Evolvulus nummularius*. This plant is used ethnobotanically as anthelmintic, antibacterial, blood purifier, memory enhancer and sedative. Methods: The plant was collected from nearby Chengalpattu, Tamil Nadu, India and the ethyl acetate extract of the whole plant was done. The extract was further processed before subjecting it to GC MS analysis. Results: The GC MS profile indicated the presence of some important molecules such as Methyl 4-O-methyl-β-D-xylopyranoside, Caryophyllene oxide, n-Hexadecanoic acid, Tetradecanoic acid, Phytol, 9,12-Octadecadienoic acid (Z,Z)-, Methyl 16-hydroxy-hexadecanoate, (E)-4-Hexenoic acid, 2-acetyl-2-(1-buten-3-yl)-, ethyl ester, β-Tocopherol, O-methyl-, Stigmasterol, β-Sitosterol, 6a,14a-Methanopicene, perhydro-1,2,4a,6b,9,9,12a-heptamethyl-10-hydroxy-, p-Coumaric acid, Betulin, Z-(13,14-Epoxy)tetradec-11-en-1-ol acetate etc. The medicinal roles of these molecules could be related to the medicinal roles of this plant.

Key words GC MS, Herbal, *Evolvulus nummularius*, Caryophyllene oxide, Tetradecanoic acid, Phytol, β-Tocopherol

INTRODUCTION

The Gas Chromatography Mass Spectroscopic analysis of the ethyl acetate extracts of one medicinal plant *Evolvulus nummularius*. Ethno-botanically this plant is known as Akhuparni in Ayurveda and used as anthelmintic, antibacterial, blood purifier, memory enhancer and sedative. Some reports on the medicinal roles

of this plant have been documented. The wound healing activity of this plant is reported by Ambika and Nair, 2019 and Sainiet al, 2007.^[1, 2] The antibacterial and antioxidant activities of this plant is reported by Sahaet al, 2016 and Pavithraet al, 2009.^[3, 4] The In vitro bioactivities of aerial extract of this plant were reported by Tamilarasanet al, 2015.^[3] The chemical components of this plant were reported by Dindaet al, 2015 and Sahu et al, 2015.^[6, 7] The hepato-protective role of *E. nummularius* was studied by Sindhu et al, 2019.^[6] There are no reports on the GC MS analysis of this plant. Therefore the present study undertook the GC MS analysis of the ethyl acetate extract of the whole plant to find the biomolecules present in it. This knowledge can lead a clue to develop natural medicines of importance, particularly in the present worldwide confusion in health care. This report is in continuance of our earlier work in this regard. ^[9-26]

MATERIALS AND METHODS

Evolvulusnummularius plant was collected from the nearby watershed areas of Chengalpattu, Tamil Nadu. The ethyl acetate extract of the shade dried whole plant was collected after 48 h of soaking. The extract was evaporated and the dried powder was used for GC-MS analysis by standard procedures.

RESULTS AND DISCUSSION

The results of the GC-MS analysis of the whole plant ethyl acetate extracts, along with the possible medicinal role of each molecule of *Evolvulusnummularius* is tabulated in Table 1. Figure 1 represents the GC-MS profile of ethyl acetate extract of the whole plant of *Evolvulusnummularius*. The identification of molecules was done by NIST spectral and the possible pharmaceutical roles of each bio molecule as per National Agriculture Library, USA and others as shown in Table 1.^[27] The GC MS profile of *Evolvulusnummularius*, indicates the presence of some compounds such as Methyl 4-O-methyl-.beta.-D-xylopyranoside, Caryophyllene oxide, n-Hexadecanoic acid, Tetradecanoic acid, Phytol, 9,12-Octadecadienoic acid (Z,Z)-, Methyl 16-hydroxy-hexadecanoate, (E)-4-Hexenoic acid, 2-acetyl-2-(1-buten-3-yl)-, ethyl ester, .beta.-Tocopherol, O-methyl-, Stigmasterol, .beta.-Sitosterol, 6a,14a-Methanopicene, perhydro-1,2,4a,6b,9,9,12a-heptamethyl-10-hydroxy-, p-Coumaric acid, Betulin, Z-(13,14-Epoxy)tetradec-11-en-1-ol acetate etc. which medicinal roles that support the use of this plant as anthelmintic, antibacterial, blood purifier, memory enhancer and sedative.

Qualitative Compound Report

Data File	220620090.D	Sample Name	Evolvulus nummularius
Sample Type		Position	103
Acq Method	GC Screening Method.M	Acquired Time	03-07-2020 PM 08:08:17
Comment			

User Chromatogram

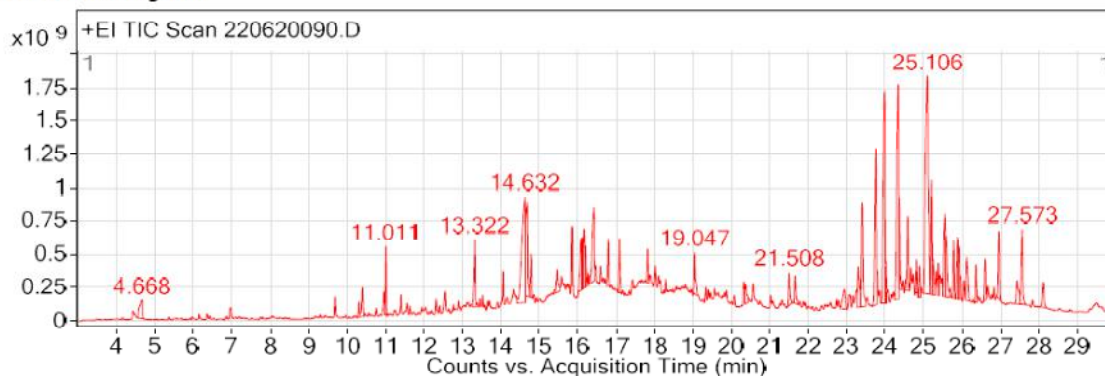


Figure 1 indicates the GC MS profile of *Evolvulusnummularius*

Table 1. Indicates the retentions values, types of possible compound, their molecular formulae, molecular mass, peak area and their medicinal roles of each compound as shown in the GC MS profile of *Evolvulusnummularius*

Sl. No	Retention Time	Compound Name	Mol. Formula	Mol. Weight	% Peak Area	Possible medical Role
1	4.67	Methyl 4-O-methyl-.beta.-D-xylopyranoside	C7H14O5	178.1	1.19	Catechol-o-Methyl-Transferase-Inhibitor, 17-beta-hydroxysteroid dehydrogenase-Inhibitor, Aldehyde-Oxidase-

						Inhibitor
2	10.40	Caryophyllene oxide	C15H24O	220.2	0.88	Nitric oxide synthase inhibitor
4	13.32	Oxirane, hexadecyl	C18H36O	268.3	1.89	Not known
5	14.63	n-Hexadecanoic acid	C16H32O2	256.2	8.50	Acidifier, arachidonic acid inhibitor
6	14.79	Hexadecanoic acid, ethyl ester	C18H36O2	284.3	1.14	arachidonic acid inhibitor
7	15.46	Tetradecanoic acid	C14H28O2	228.2	0.87	Acidifier, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, inhibit the production of uric acid
8	15.85	Phytol	C20H40O	296.3	0.88	Antimicrobial, anti-inflammatory, antioxidant, diuretic
9	16.09	9,12-Octadecadienoic acid (Z,Z)-	C18H32O2	280.2	1.85	Acidifier, arachidonic acid inhibitor
10	16.12	Pilocarpine	C11H16N2O2	208.1	1.40	Not known
11	16.20	9-Octadecenoic acid, (E)-	C18H34O2	282.3	0.88	Acidifier, arachidonic acid inhibitor
12	16.43	Octadecanoic acid	C18H36O2	284.3	3.59	Acidifier, arachidonic acid inhibitor
13	16.80	3,7,11,15-Tetramethyl-2-hexadecen-1-ol	C20H40O	296.3	1.17	Oligosaccharide provider
14	17.09	8-Hexadecenal, 14-methyl-, (Z)-	C17H32O	252.2	1.33	Not known
15	17.83	2H-Pyran-2-one, tetrahydro-6-nonyl-	C14H26O2	226.2	0.84	Not known
16	19.05	Methyl 16-hydroxy-hexadecanoate	C17H34O3	286.3	1.22	Catechol-O-Methyl-Transferase-Inhibitor
17	20.37	Butyl 6,9,12-hexadecatrienoate	C20H34O2	306.3	0.76	Not known
18	21.51	Ethyl stearate, 9,12-diepoxy	C20H36O4	340.3	0.95	Not known
19	21.66	(E)-4-Hexenoic acid, 2-acetyl-2-(1-buten-3-yl)-, ethyl ester	C14H22O3	238.2	0.83	Arylamine-N-Acetyltransferase-Inhibitor, Inhibit Acetyl Coenzyme-A
20	23.31	.beta.-Tocopherol, O-methyl-	C29H50O2	430.4	1.77	Tocopherol-Synergist, AntiTGF-beta, Beta-Adrenergic Receptor Blocker, Beta-Andrenergic-Agent
21	23.76	Campesterol	C28H48O	400.4	5.62	Plant steroid use as food additive and has cholesterol lowering role
22	23.99	Stigmasterol	C29H48O	412.4	8.80	Precursor of progesterone act as intermediate in the biosynthesis of androgens, and estrogensAntiosteoarthritic, antihypercholesterolemic, cytotoxic, antitumor, hypoglycaemic,

						antimutagenic, antioxidant, anti-inflammatory, Analgesic.
23	24.35	.beta.-Sitosterol	C29H50O	414.4	10.21	17 beta dehydrogenase inhibitor, androgen blocker, anti-amyloid beta, anticancer, Anti TGF beta, Beta 2- receptor, beta blocker, beta-galactosidase inhibitor, beta-glucuronidase inhibitor
24	24.59	6a,14a-Methanopicene, perhydro-1,2,4a,6b,9,9,12a-heptamethyl-10-hydroxy-	C30H50O	426.4	2.00	Beta-Adrenergic Receptor Blocker, Beta-Glucuronidase-Inhibitor, Beta-Galactosidase-Inhibitor, 17-beta-hydroxysteroid dehydrogenase-Inhibitor, Beta-Blocker, Beta-2-Receptor-Agonist, Anti-amyloid-Beta, AntiTGF-beta, Dopamine-Receptor-Inhibitor, Angiotensin-Receptor-Blocker, Alcohol-Dehydrogenase-Inhibitor, Dehydrogenase-Inhibitor, Succinate-Dehydrogenase-Inhibitor, Succinic-Dehydrogenase-Inhibitor, Beta-Andrenergic-Agent, ER-Beta-Binder, Glucuronidase-Inhibitor, 11B-HSD-Inhibitor, 12-Lipoxygenase-Inhibitor, 5-Alpha-Reductase-Inhibitor
25	24.89	2H-Pyrazol-3-ol, 5-(2,5-dimethylthiophen-3-yl)-	C9H10N2 OS	194.1	0.92	Not known
26	25.11	D:A-Friedooleanan-3-ol, (3.alpha.)-	C30H52O	428.4	15.19	Not known
27	25.21	Friedelan-3-one	C30H50O	426.4	3.15	Not known
28	25.39	p-Coumaric acid	C9H8O3	164	0.92	Inhibit Production of Uric Acid, Urinary-Acidulant, Urine-Acidifier, Adrenalin-Pressor, Algogenic (pain-causing), Anesthetic-potentiator, ANS-Paralytic, Anti-cAMP-Phosphodiesterase, Anticancer, Antidote
29	25.56	Tetracyclo[5.4.3.0(7,11)] tetradecane-2.alpha.-5.beta.diol-10-one, 1,4.alpha.,6,14-tetramethyl-4-vinyl-	C20H32O 3	320.2	3.21	Not known
30	25.89	Phytol, acetate	C22H42O 2	338.3	1.73	Not known
31	26.61	Betulin	C30H50O 2	442.4	2.34	It has a role as a metabolite, an antiviral

						agent, an analgesic, an anti-inflammatory agent and an antineoplastic agent
32	26.97	Z-(13,14-Epoxy)tetradec-11-en-1-ol acetate	C16H28O3	268.2	2.06	Increase Zinc Bioavailability, Oligosaccharide Provider
33	28.11	Ethanol, 2-(9-octadecenyloxy)-, (Z)-	C20H40O2	312.3	1.03	Ethanol absorption inhibitor, Ethanolytic

CONCLUSION

It is concluded that this plant has molecules with activities that augur well with those of this plant.

ACKNOWLEDGEMENTS

The authors thankfully acknowledge the support of all the people and organizations.

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