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The GC MS Study of Leaf Extract One Herbal Plant, *Tarenna asiatica* (L)

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ABSTRACT

To find the biomolecules present in the leaf aqueous extracts of one wild herbal plant, Tarenna asiatica (L.) by GC MS analysis. GC MS study of one leaf aqueous extracts of one wild herbal plant, Tarenna asiatica was subjected to GC MS analysis by standard procedures.

Results: It was observed that some important biomolecule present in the GC MS profile such as N-benzyl-2-phenethylamine, tridecanoic acid, methyl ester, pentanoic acid, phytol, 2-methylheptanoic acid, heptafluorobutyric acid, 2-naphthyl ester, 2(1H)-pyridinone, 1-[2-deoxy-3,5-bis-O-(4-methylbenzoyl)-beta-D-erythro-pentofuranosyl]- etc. had the medicinal roles which correspond well with medicinal roles of the plant as claimed ethno botanically and by scientific reports. The GC MS profile of T. asciatica clearly indicates the medicinal roles ascribed to it.

Key words: *Tarenna asiatica,* GC MS, Aqueous, N-Benzyl-2-phenethylamine, Tridecanoic acid, Methyl ester, Pentanoic acid, Phytol, 2-Methylheptanoic acid, Heptafluorobutyric acid, 2-Naphthyl ester, 2(1H)-Pyridinone

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INTRODUCTION

Tarenna asiatica (L) is a wild herb with many medicinal roles. Ethnobotanically is used for a treatment of a number of ailments such as wound healing, antidote, paralysis, and anti-inflammatory, for eye infection and to stop vomiting. Its antioxidant and antimicrobial activities have been reported by many authors Karthikkumaran, et al., Amutha, et al., Ramabharathi, et al. Anjanadevi, et al., Deborah, et al. have reported the anticancer activity of the fruit extract against human breast cancer. The present study is to know the biomolecules present in the leaf extract of this plant by GC MS analysis [1-5]. This knowledge could throw some light on the possible mechanisms for the medicinal roles of this plant. It is high time that herbal medicines should be thoroughly analysed in the light of modern medical parameters to establish their efficacy [6-24].

MATERIALS AND METHODS

Tarenna asiatica plant was procured from the nearby hill at Chengalpattu and was identified by a qualified botanist from Madras University, Chennai. The leaves were collected and thoroughly washed and aqueous extracts was prepared. The extract was then dried and the powder obtained was subjected to GC MS analysis by standard procedure.

Instrument: Gas chromatography (Agilent: GC: (G3440A) 7890A. MS MS: 7000 triple Quad GCMS) was equipped with mass spectrometry detector.

Sample preparation: 100 micro lit samples dissolved in 1 ml of suitable solvents. The solution stirred vigorously using vortex stirrer for 10 seconds. The clear extract was determined using gas chromatography for analysis.

GC MS protocol: Column: DB5 MS (30 mm × 0.25 mm ID × 0.25 µm, composed of 5% phenyl 95% methyl poly siloxane), electron impact mode at 70 EV; helium (99.999%) was used as carrier gas at a constant flow of 1 ml/min injector temperature 280°C; auxiliary temperature: 290°C ion source temperature 280°C.

The oven temperature was programmed from 50°C (isothermal for 1.0 min), with an increase of 40°C/min, to 170°C C (isothermal for 4.0 min), then 10°C/min to 310°C (isothermal for 10 min) fragments from 45 to 450 Da. Total GC running time is 32.02 min. The compounds are identified by GC MS library (NIST and Wiley).

RESULTS AND DISCUSSION

The results of GC MS study are shown in Table 1 and Figure 1.

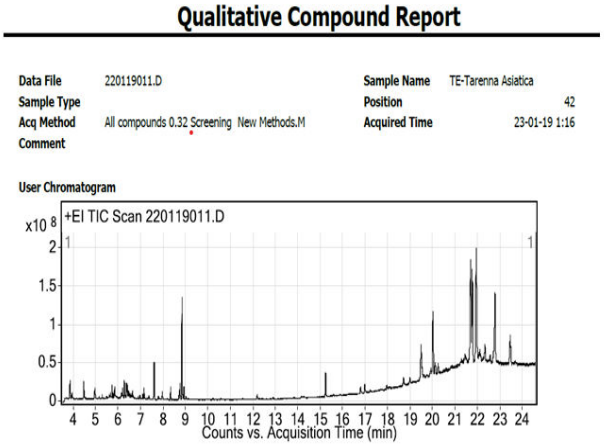

Figure 1: The GC MS graph of the leaf extract of Tarrena asiatica.

Table1: Indicating the molecules present in the GC MS analysis of *Tarenna asiatica* (L) with retention time, molecular formula, peak area, peak height and molecular mass and possible medicinal roles.

Reten. time	Name of molecule	Mol. formula	Peak height	Mol. mass	Possible medicinal roles
3.84	Hexane, 3,3-dimethyl-	C_8H_{18}	7331565	114.1	Not Known
3.94	Bicyclo[3.2.0]hepta-2,6-diene	C_7H_8	3860079	92.1	Not Known
4.45	N-benzyl-2-phenethylamine	$C_{15}H_{17}N$	10042429	211.1	Anaphylactic, aryl amine-N-acetyl transferease Inhibitor, decrease nor epinephrine production, GABA-nergic, increase NK cell activity, Inhibit tumor necrosis factor, myo-neurostimulant, NADH oxidase inhibitor, CNS depressant
4.95	Acetoxy-3-methoxystyrene	$C_{11}H_{12}O_3$	4722140	192.1	Not known
5.83	Trimethylsilyloxycyclobutane	$C_7H_{16}OSi$	3661847	144.1	Not known
6.18	tert-Butyldimethylsilyl acetate	$C_8H_{18}O_2Si$	3761014	174.1	Not known
6.26	Silane, [(1,1-dimethyl-2-propenyl)oxy]dimethyl-	$C_7H_{16}OSi$	3257561	144.1	Oxytocic, oxytoxic
6.52	Silanol, trimethyl-, acetate	$C_5H_{12}O_2Si$	1109385	132.1	Not known
7.14	2-Cyclopentylethanol	$C_7H_{14}O$	1645030	114.1	Not known
7.59	Tridecanoic acid, methyl ester	$C_{14}H_{28}O_2$	10830913	228.2	Catechol-o-methyl-transferase-inhibitor, catechol-o-methyltransferase-inhibitor, methyl donor, methyl guanidine inhibitor, acidifier, acidulant, arachidonic acid inhibitor, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, inhibit production of uric acid, urinary acidulant

7.76	Pentanoic acid	$C_5H_{10}O_2$	679733	102.1	Acidifer, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, increase uric acid production
8.74	1,3-Methanopentalene, octahydro-	C_9H_{14}	1766693	122.1	Not known
8.82	Phytol	$C_{20}H_{40}O$	12787752	296.3	Antimicrobial anti-inflammatory antioxidant diuretic
8.91	2-Methylheptanoic acid	$C_8H_{16}O_2$	419204	144.1	Acidifer, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, increase uric acid production
15.21	Trifluoroacetyl-lavandulol	$C_{12}H_{17}F_3O_2$	8690639	250.1	Not Known
19.9	Phosphorus pentafluoride	F_5P	587768	126	Not known
19.98	1-Formyl-2,2,6-trimethyl-3-cis-(3-methylbut-2-enyl)-5-cyclohexene	$C_{15}H_{24}O$	5380676	220.2	Not known
20.09	1,2-Benzenediol, O-(5-chlorovaleryl)-O-(2-methylbenzoyl)-	$C_{19}H_{19}ClO_4$	546676	346.1	Not known
20.21	Cyanogen bromide	CBrN	802572	104.9	Cynogenic toxic
20.26	Heptafluorobutyric acid, 2-naphthyl ester	$C_{14}H_7F_7O_2$	1142331	340	Acidifer, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, increase uric acid production
21.41	2(1H)-Pyridinone, 1-[2-deoxy-3,5-bis-O-(4-methylbenzoyl)-beta-D-erythro-pentofuranosyl]-	$C_{26}H_{25}NO_6$	689592	447.2	Acidifer, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, increase uric acid production
21.53	Carbamic acid, monoammonium salt	$CH_6N_2O_2$	1032531	78	Acidifer, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, increase uric acid production
21.65	10,10-Dimethyl-2,6-dimethylenebicyclo[7.2.0]undecan-5beta-ol	$C_{15}H_{24}O$	7742701	220.2	Acidifer, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, increase uric acid production
21.72	Diazoprogesterone	$C_{21}H_{30}N_4$	6968207	338.2	Not known
21.92	6beta bicyclo[4.3.0]nonane, 5beta-iodomethyl-1beta-isopropenyl-4alpha, 5alpha-dimethyl-,	$C_{15}H_{25}I$	7595792	332.1	Not known
22.02	Isophthalic acid, di(2-methylprop-2-en-1-yl) ester	$C_{16}H_{18}O_4$	1425098	274.1	Acidifer, arachidonic acid inhibitor, increase aromatic amino acid decarboxylase activity, increase uric acid production
22.3	Silane, diethylethoxy(2-methylpent-3-yloxy)-	$C_{12}H_{28}O_2Si$	5367612	232.2	Not known
22.38	1,3-Dioxolane-2-methanol	$C_4H_8O_3$	7084043	104	Not known

22.73	4-Methyl-2,4-bis(4-trimethylsilyloxyphenyl)pentene-1	$C_{24}H_{36}O_2Si_2$	9202952	412.2	Catachol-methyl transferase inhibitor, methyl donar, methyl guanidine inhibitor
22.74	1,3-Dimethyl-5-propyl-7-(propene-1-yl)adamantane	$C_{18}H_{30}$	10822038	246.2	Not known
23.42	Tricyclo[3.3.1.1(3,7)]decanone, 4-iodo-, (1alpha, 3beta, 4alpha, 5alpha, 7beta)	$C_{10}H_{13}IO$	3488103	276	Not known
23.75	1,3-Benzenediol, o-(2-methoxybenzoyl)-o'-ethoxycarbonyl-	$C_{17}H_{16}O_6$	1691039	316.1	Not known
24.55	1,2-Benzenediol, o-(4-methoxybezoyl)-o'-(5-chlorovaleryl)-	$C_{19}H_{19}ClO_5$	1718256	362.1	Not known

The medicinal roles of some of the molecules are mentioned as per Dr. Duke's phytochemical data base. Most of the compounds such as N-benzyl-2-phenethylamine, tridecanoic acid, methyl ester, pentanoic acid, phytol, 2-methylheptanoic acid, heptafluorobutyric acid, 2-naphthyl ester, 2(1H)-pyridinone, 1-[2-deoxy-3,5-bis-O-(4-methylbenzoyl)-beta-D-erythro-pentofuranosyl]- etc. indicated similar medicinal roles such as catechol-o-methyl-transferase-inhibitor,catechol-o-methyl transfera se inhibitor, methyl donor, methyl guanidine inhibitor, acidifier, acidulant, arachidonic acid inhibitor, arachidonic acid inhibitor, Increase aromatic amino acid decarboxylase activity, inhibit production of uric acid, urinary acidulate etc. It is interesting to note that the medicinal roles indicate mostly antioxidant, antibacterial anti-inflammatory properties which auger well with the various reports on the ethno botanical medicinal roles of this plant.

The medicinal roles of some of the molecules such as hexane, 3, 3-dimethyl-, bicyclo[3.2.0]hepta-2,6-diene, 4-acetoxy-3-methoxystyrene, trimethylsilyloxycyclobutane, tert-butyldimethylsilyl acetate, silanol, trimethyl, acetate, 2-cyclopentylethanol, 1,3-methanopentalene, octahydro, trifluoroacetyl lavandulol, phosphorus pentafluoride, 1-formyl-2, 2,6-trimethyl-3-cis-(3-methylbut-2-enyl)-5-cyclohexene, 1,2-benzenediol, o-(5-chlorovaleryl)-O-(2--(2-methylbenzoyl)-,Diazoprogesterone, 6.beta.Bicyclo [4.3.0]nonane, 5.beta.-iodomethyl-1.beta.-isopropenyl-4. alpha.,5.alpha.-dimethyl-,1, 3-Dioxolane-2-methanol, Tricyclo[3.3.1.1(3,7)]decanone, 4-iodo-,(1.alpha.3.beta., 4.alpha.,5.alpha.,7.beta.)-, 1,3-Benzenediol, o-(2-methoxybenzoyl)-o'-ethoxycarbonyl-, 1,2-Benzenediol, o-(4-methoxybezoyl)-o'-(5-chlorovaleryl)- are not reported yet which must be worked out.

CONCLUSION

From the above results and discussion it is clear that GC MS profile of aqueous extract of leaves of T*arenna asiatica* (L) indicted the presence of some very important molecules having medicinal roles supporting the ethno botanical claims of this plant being an excellent medicinal plant.

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