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'The Gc Ms Analysis Of Ethyl Acetate Extract Of One Herbal Plant, 'Striga Densifloral'

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ABSTRACT

The present study deals with the GC MS analysis of one medicinal plant, 'StrigadensifloraL.Strigadensiflora is a hemiparasitic plant with small white flowers harms the root systems of crops. Although parasitic, this plant has some ethno-medicinal uses. The plant Strigadensiflorawas collected from the nearby hills at Chengalpattu, Tamil Nadu. The ethyl acetate extract of the aerial parts of the plant was subjected to GC MS study following standard protocols. It was observed that some very important molecules such as 7-Octadecyne, 2-methyl-, n-Hexadecanoic acid, 2-((Octan-2-yloxy)carbonyl)benzoic acid, Sulfurous acid, butyl heptadecyl ester, Campesterol, Stigmasterol, .beta.-Sitosterol, .beta.-Sitosterol, Betulin were shown in the GC MS profile. These molecules do have medicinal role which could contribute to the medicinal value of this plant. Further work is needed to substantiate the medicinal role of this plant.

KeyWord GC MS, Strigadensiflora, n-Hexadecanoic acid, Sulfurous acid, butyl heptadecyl ester, Campesterol, Stigmasterol, .beta.-Sitosterol,Betulin

INTRODUCTION

Strigadensiflora is a hemiparasitic plant with small white flowers. This plant harms the root systems of crops and farmers try to weed it out to protect the crops. Although parasitic, this plant has some ethno-medicinal uses. There are scanty reports on its medicinal roles and yet to be probed in detail.Kakpure and Rothe, 2012, have done the phytochemical screening of this plant.This plant is known to have medicinal roles such as appetizer, antihypertensive, stimulant, and hypolipedimic (Adirukmi, 1994; Ong, 2011). Hiremath, 1997 have reported its antifertility as well as anti-bacterial, antifungal and anthelmintic roles. Koua, 2011 has reported the phytochemistry and pharmacological properties of a related species, S. hermonthica. This plant is alsoused to treat diabetes, leprosy, pneumonia, jaundice and has antibacterial and antiplasmodial roles (Kouaet al, 2011). The present work reports the GC MS pattern of the ethyl acetate extracts of Strigadensiflora whole plant. This is in continuation of our endeavour to establish the medicinal efficacy of the herbal and traditional systems of Ayurveda, Sidhha and Unani systems of medicine (Priyadarshiniet al, 2017; Jayakumariet al, 2017; Raoet al, 2018; Vijayalakshmi and Rao, 2019; Yuvarajet al, 2019; Mutteviet al, 2019, Raoet al, 2019; Mutteviet al, 2020; Vijayalakshmi and Rao, 2020; Janakiet al, 2021, Perumalet al, 2021).

MATERIALS AND METHODS

The plant Strigadensiflorawas collected from the nearby hills at Chengalpattu, Tamil Nadu. The plant was identified by a qualified botanist at Chennai. 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.

GC-MS Procedure

Instrument: GC (Agilent: GC: (G3440A) 7890A. MS/MS: 7000 Triple Quad GCMS) was equipped with MS detector.

Sample Preparation

About 100 ml sample was dissolved in 1 ml of suitable solvents. The solution was stirred vigorously using vortex stirrer for 10 s. The clear extract was determined using GC for analysis.

GC-MS Protocol

Column DB5 MS (30 mm × 0.25 mm ID ×0.25 µm, composed of 5% phenyl 95% methylpolysiloxane), 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; auxilary 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 the GC-MS analysis of the whole plant ethyl acetate extract, along with the possible medicinal role of each molecule ofStrigadensifloraextract are tabulated in Table 1. Figure 1 represents the GC-MS profile of ethyl acetate extract of the whole plant of Strigadensiflora. The identification of metabolites was accomplished by comparison of retention time and fragmentation pattern with mass spectra in the NIST spectral library stored in the computer software (version 1.10 beta, Shimadzu) of the GC-MS along with the possible pharmaceutical roles of each bio molecule as per Dr. Duke's Phytochemical and ethno-botanical data base (National Agriculture Library, USA) and others as shown in Table 1. Table no. 1 indicates the presence of a wide range of molecules having important medicinal roles, such as 7-Octadecyne, 2-methyl-, n-Hexadecanoic acid, 2-((Octan-2-yloxy)carbonyl)benzoic acid, Sulfurous acid, butyl heptadecyl ester, Campesterol, Stigmasterol, .beta.-Sitosterol, Betulin etc. Further work is warranted to study the molecular roles of this plant in details.

CONCLUSION

It is concluded that the types of medicinal values the molecules have, as is shown in the Table 1, Strigadensifloracan prove itself as an important medicinal plant.

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Figure 1. Represents the GC MS graph of ethyl acetate extract Strigadensiflora'.

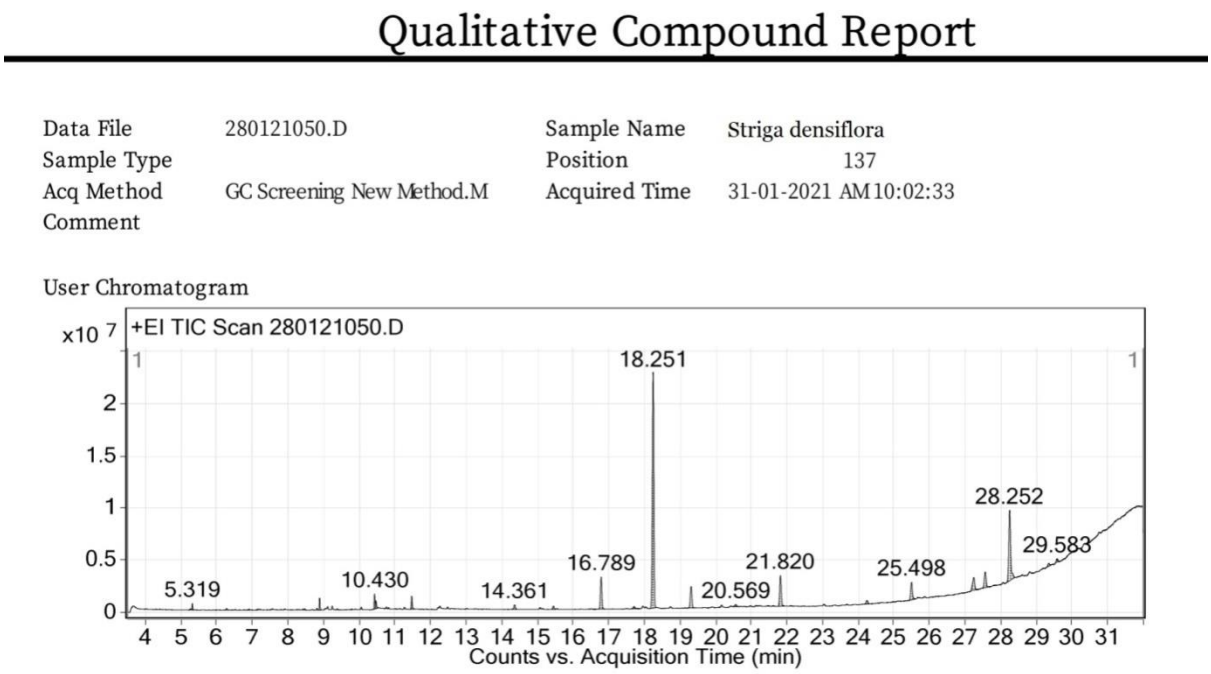

Table 1. Indicates the retentions time, types of possible compound, molecular formula, molecular mass, percentage peak area and the possible medicinal roles of each compound as shown in the GC MS profile ofStrigadensiflora'.

Ret. Time	Compound	Mol. Formula	Mol. Mass	% Peak Area	Possible Medicinal Role
8.89	7-Octadecyne, 2-methyl-	C19H36	264.3	1.18	Catechol-O-methyl-Transferase

					Inhibitor, methyl Donar, Methyl Guanidine Inhibitor
10.43	n-Hexadecanoic acid	C16H32O2	256.2	1.77	Acidifier, Arachidonic acid Inhibitor, Increases Aromatic Amino acid decarboxylase activity, Inhibits production of uric acid, Urine acidifier, Anaphylactic, Arylamine N acetyltransferase inhibitor, decreases norepinephrine production, Down regulates nuclear and cytosol androgen reuptake, GABA-nergic, Increase NK cell activity, inhibits production of tumor necrosis factor, Myo-neuro-stimulator
11.48	Cyclohexanol, 5-methyl-2-(1-methylethyl)-, (1.alpha.,2.beta.,5.alpha.)-(.+/-.)-	C10H20O	156.2	1.77	Not Known
16.79	Dodecane, 1-fluoro-	C12H25F	188.2	6.13	Not Known
18.25	2-((Octan-2-yloxy)carbonyl)benzoic acid	C16H22O4	278.2	49.98	Acidifier, Arachidonic acid inhibitor, Increases Aromatic Amino acid Decarboxylase activity
21.82	Sulfurous acid, butyl heptadecyl ester	C21H44O3S	376.3	6.47	Acidifier, Arachidonic acid inhibitor, Increases Aromatic Amino acid Decarboxylase activity

25.50	4,5,6,7-Tetrahydro-benzo[c]thiophene-1-carboxylic acid allylamide	C12H15NOS	221.1	4.12	Not Known
27.25	Campesterol	C28H48O	400.4	3.67	Plant steroid use as food additive and has cholesterol lowering role
27.57	Stigmasterol	C29H48O	412.4	3.69	Precursor of progesterone , acts as intermediate in the biosynthesis of androgens and estrogens, anti-osteoarthritic, antihypercholesterolemic, cytotoxic, antitumor, hypoglycemic, antimutagenic, antioxidant, anti-inflammatory, analgesic
28.25	.beta.-Sitosterol	C29H50O	414.4	18.09	17 beta dehydrogenase inhibitor, androgen blocker, anti-amyloid beta, anticancer, Anti TGF beta, Beta 2- receptor, beta blocker, beta-galactosidase inhibitor, beta-glucuronidase inhibitor
29.36	Betulin	C30H50O2	442.4	0.62	It has a role as a metabolite, an antiviral agent, an analgesic, an anti-inflammatory agent and an antineoplastic agent