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'The Gc Ms Analysis Of Ethyl Acetate Extract Of One Herbal Plant, 'Dichrostachys Cinarea'

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ABSTRACT

The present study deals with the GC MS pattern of the ethyl acetate leaf extract of one plant, Dichrostachyscinarea Wight. andArn. Mostly roots of this plant areused to treat disorders such as renal problem, diabetes, rheumatism, urinary calculi and menstrual disorders. This plant was collected from nearby hills of Chengalpattu, Tamilnadu. The ethyl acetate extract of the leaves of the plant was subjected to GC MS study following standard protocols. It was observed that some very important molecules such as7-Octadecyne, 2-methyl-, n-Hexadecanoic acid , Myo-Inositol, 4-C-methyl-, 3,7,11,15-Tetramethyl-2-hexadecen-1-ol , Sulfurous acid, butyl heptadecyl ester , Squalene , dl-.alpha.-Tocopherol , Campesterol , Stigmasterol, .beta.-Sitosterol. These molecules which have many important medicinal role scould contribute the medicinal value of this plant.

KeyWords GC MS, Dichrostachyscinarea, n-Hexadecanoic acid, Myo-Inositol, Squalene , dl-.alpha.-Tocopherol, Campesterol, Stigmasterol, .beta.-Sitosterol

INTRODUCTION

Dichrostachyscinarea Wight.andArn., known as Veerataru in Ayurveda, belongs to family Mimosacease. It roots are mainly used for to treat disorders such as renal problem, diabetes, rheumatism, urinary calculi and menstrual disorders. This is also known for its diuretic, antimicrobal, antihelmintic, antidiarrheal, anticancer and hepatoprotective roles. (Kirtikar and Basu, 1984) There are quite a few reports on the various medicinal aspects of this plant. Bolleduet al, 2019 have shown the anti-diabetic role of this plant. El-Sharawyet al, 2017 have reported the antiviral and antiparasitic activities of the major constituent, namely, Clovamide, from Dichrostachyscinarea. Aworet-Samsenyet al, 2011 have reported the role of extract of this plant on the contractility of smooth muscles in Guinea pig. Neondoet al, 2012 have reported the antibacterial and toxicity evaluation of the plant. Adikayet al, 2009 have reported the positive role of alcoholic extract of root of this plant against cisplatin induced nephrotoxicity in rats. The anticonvulsant and analgesic role ofthis plant was studied by Irie-Nguessanet al, 2018. Bhupesh and Sharma, 2013 have done the clinical evaluation of Veerataru (Dichrostachyscinarea) in the management of Dysuria. The present works deals with the GC MS analysis of the ethyl acetate extract of the aerial parts of Dichrostachys cinarea. This work is in continuation of our work to establish the efficacy of the herbal plants, Ayurvedic and Sidhha medicines. (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 Dichrostachyscinareawas collected from the nearby fills at Chengalpattu, Tamil Nadu. The plant was identified by a qualified botanist at Chennai. The ethyl acetate extract of the shade dried leaves were collected after 48 h of soaking. The extract was evaporated and the dried powder was sed 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

sing 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 ofDichrostachyscinareaextract are tabulated in Table 1. Figure 1 represents the GC-MS profile of ethyl acetate extract of the whole plant of Dichrostachyscinarea.

The identification of metabolites as 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. From the results it was observed that this plant contained some very important biomolecules such as 7-Octadecyne, 2-methyl-, n-Hexadecanoic acid , Myo-Inositol, 4-C-methyl-, 3,7,11,15-Tetramethyl-2-hexadecen-1-ol , Sulfurous acid, butyl heptadecyl ester , Squalene , dl-.alpha.-Tocopherol , Campesterol , Stigmasterol, .beta.-Sitosterol, etc. which show promising medicinal roles (Table 1).

CONCLUSION

Thus it can be concluded that due to the presence of these molecules, Dichrostachyscinareahas the

medicinal roles for which it is used. Further work to isolate and understand the molecular mechanism is warranted.

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Figure 1. Shows the GC MS profile graph of ethyl acetate extract of Dichrostachyscinarea

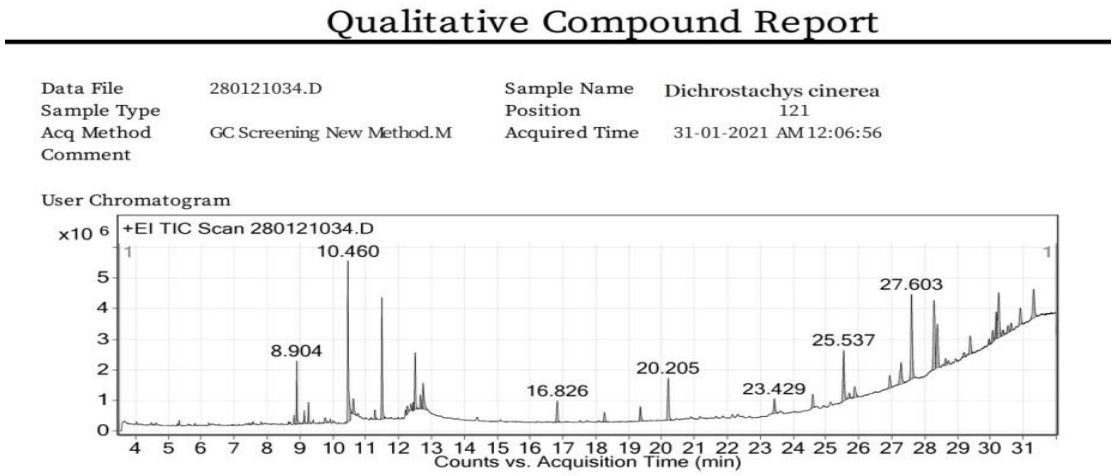

Table 1.Indicates the retention time, types of possible compound, molecular formula, molecular mass, percentage peak area and the possible medicinal roles of each compound as shown in the GC MS profile ofDichrostachyscinarea

Ret. Time	Molecule	Mol. Formula	Mol. Mass	% Peak Area	Possible Medicinal Role

8.90	7-Octadecyne, 2-methyl-	C19H36	264.3	3.39	Catechol-O-Methyl-Transfearse inhibitor, Methyl donor, Methyl guanidine inhibitor
10.46	n-Hexadecanoic acid	C16H32O2	256.2	11.39	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
10.63	Myo-Inositol, 4-C-methyl-	C7H14O6	194.1	1.43	Myo-neuro stimulant, myocardiotonic,myolytic, myo relaxant, Catechol-O-Methyl-Transfearse inhibitor, Methyl donor, Methyl guanidine inhibitor
11.50	Cyclohexanol, 5-methyl-2-(1-methylethyl)-, (1.alpha.,2.beta.,5.alpha.)-(.+/-.)-	C10H20O	156.2	7.75	Not known
12.50	3,7,11,15-Tetramethyl-2-	C20H40O	296.3	4.21	Oligosaccharide provider

	hexadecen-1-ol				
12.75	9,12,15-Octadecatrienoic acid, (Z,Z,Z)-	C18H30O2	278.2	2.78	Not known
16.83	Dodecane, 1-fluoro-	C12H25F	188.2	2.11	Not known
19.35	Sulfurous acid, butyl heptadecyl ester	C21H44O3S	376.3	1.52	Acidifier, Arachidonic acid inhibitor, Increases Aromatic Amino acid Decarboxylase activity
20.21	Squalene	C30H50	410.4	4.39	Monooxygenase inhibitor, biochemical precursor in the preparation of steroids, natural moisturizer, used in cosmetics
23.43	1-Nonylcycloheptane	C16H32	224.3	1.75	Not known
24.60	Eicosyl acetate	C22H44O2	340.3	1.35	Not known
25.54	4,5,6,7-Tetrahydro-benzo[c]thiophene-1-carboxylic acid allylamide	C12H15NOS	221.1	5.78	Not known
25.71	dl-.alpha.-Tocopherol	C29H50O2	430.4	0.53	Tocopherol synergist, 5 alpha reductase inhibitor, Alpha agonist, Alpha amylase inhibitor, Alpha glucosidase inhibitor, HIF-1 alpha inhibitor, Ikappa B-alpha phosphorylation inhibitor, Increase alpha mannosidase activity, Interleukin 1-alpha inhibitor, Testosterone-5-Alpha-Reductase-Inhibitor, TNF- alpha inhibitor
25.87	cis-1-Chloro-9-octadecene	C18H35Cl	286.2	1.46	Not known
26.94	Octacosyl acetate	C30H60O2	452.5	1.44	Not known

27.28	Campesterol	C28H48O	400.4	3.35	Plant steroid use as food additive and has cholesterol lowering role
27.60	Stigmasterol	C29H48O	412.4	9.63	Precursor of progesterone , acts as intermediate in the biosynthesis of androgens and estrogens, anti-osteoarthritic, antihypercholesterolemic, cytotoxic, antitumor, hypoglycemic, antimutagenic, antioxidant, anti-inflammatory, analgesic
28.29	.beta.-Sitosterol	C29H50O	414.4	8.33	17 beta dehydrogenase inhibitor, androgen blocker, anti-amyloid beta, anticancer, Anti TGF beta, Beta 2- receptor, beta blocker, beta-galactosidase inhibitor, beta-glucuronidase inhibitor
28.39	9-Eicosyne	C20H38	278.3	5.11	Not Known

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