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# 'The Gc Ms Analysis of Ethyl Acetate Extract of One Herbal Plant, 'Lepidagathiscristata'

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**Abstract**

The present reports deals with the GC MS analysis of the ethyl acetate extracts of the whole plant of one medicinal plant, *Lepidagathiscristata*.The plant *Lepidagathiscristata*was 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. It was observed in the GC MS profile of this plant that some very important molecules such as trans-3-Methyl-2-n-propylthiophane, .beta.-l-Arabinopyranoside, methyl, Aluminum, triethyl-, Acetic acid, trifluoro-, anhydride, 1,2,4-Cyclopentanetrione, 3-methyl-, Methyl 2,3-anhydro-.beta.-d-ribofuranoside, Cyclobutanecarboxylic acid, cyclobutyl ester, 4-Methylnonanoic acid, Borinic acid, diethyl-, Methyl 2,6-anhydro-.alpha.-d-altroside, Sulfurous acid, cyclohexylmethylheptadecyl ester, n-Hexadecanoic acid, .beta.-D-Mannothiofuranoside, S-n-octyl- which have various important medicinal roles which support this plant's role as a medicine, ethnomedicinally.

**Keywords**: GC MS, Ethyl acetate, trans-3-Methyl-2-n-propylthiophane, .beta.-l-Arabinopyranoside, methyl, Aluminum, triethyl-, Acetic acid, n-Hexadecanoic acid,

## INTRODUCTION

The present work deals with the GC MS analysis of one herbal plant, *Lepidagathiscristata.* This plant is known to have some medicinal value in ethno-pharmacology. Some reports on the medicinal role of this plant are available.The analgesic activity of *Lapidagathis* flower extract was reported by Reddy and Rao, 2013.Abubacker and Devi, 2014 have reported the antifungal activity of compounds isolated from *Lepidagathiscristata*. They have also reported the wound healing potential of this plant extracts (Abubacker and Devi. 2016). This plant has been reported to have many medicinal roles such as antiemetic (Reddy *et al*, 2014), antibacterial (Rose *et al*, 2014), anti-inflammatory (Purma and Rao, 2013), hypoglycemic (Srinija*et al*, 2013). Sharmila*et al*, 2018 have studied the physicochemical aspects of related species of *Lepidagathisscariosa*. Razeena and Mini, 2017 have reported the bio-efficacy of related species, *L.keralensis*.This work is in continuation of our work to establish the efficacy of the herbal plants, Ayurvedic and Sidhha medicines. (Priyadarshini*et al,* 2017; Jayakumari*et al*, 2017; Rao*et al,* 2018; Vijayalakshmi and Rao, 2019; Yuvaraj*et al*, 2019; Mutteve*et al,* 2019, Rao*et al*, 2019; Mutteve*et al,* 2020; Vijayalakshmi and Rao, 2020; Janaki*et al*, 2021).

## MATERIALS AND METHODS

The plant *Lepidagathiscristata*was 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 of*Lepidagathiscristata*extract are tabulated in Table 1. Figure 1 represents the GC-MS profile of ethyl acetate extract of the whole plant of *Lepidagathiscristata.* 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.From Table 1, it is clear that this plant has many important metabolites such as trans-3-Methyl-2-n-propylthiophane, .beta.-l-Arabinopyranoside, methyl, Aluminum, triethyl-, Acetic acid, trifluoro-, anhydride, 1,2,4-Cyclopentanetrione, 3-methyl-, Methyl 2,3-anhydro-.beta.-d-ribofuranoside, Cyclobutanecarboxylic acid, cyclobutyl ester, 4-Methylnonanoic acid, Borinic acid, diethyl-, Methyl 2,6-anhydro-.alpha.-d-altroside, Sulfurous acid, cyclohexylmethylheptadecyl ester, n-Hexadecanoic acid, .beta.-D-Mannothiofuranoside, S-n-octyl- etc. which augur well with the medicinal role of this plant. Further work is warranted to understand the molecular mechanism of action for each of the molecule as shown in the GC MS profile.

**CONCLUSION**

From the above results it is imperative that *Lepidagathiscristata* is an important medicinal plant.

**ACKNOWLEDGMENTS**

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

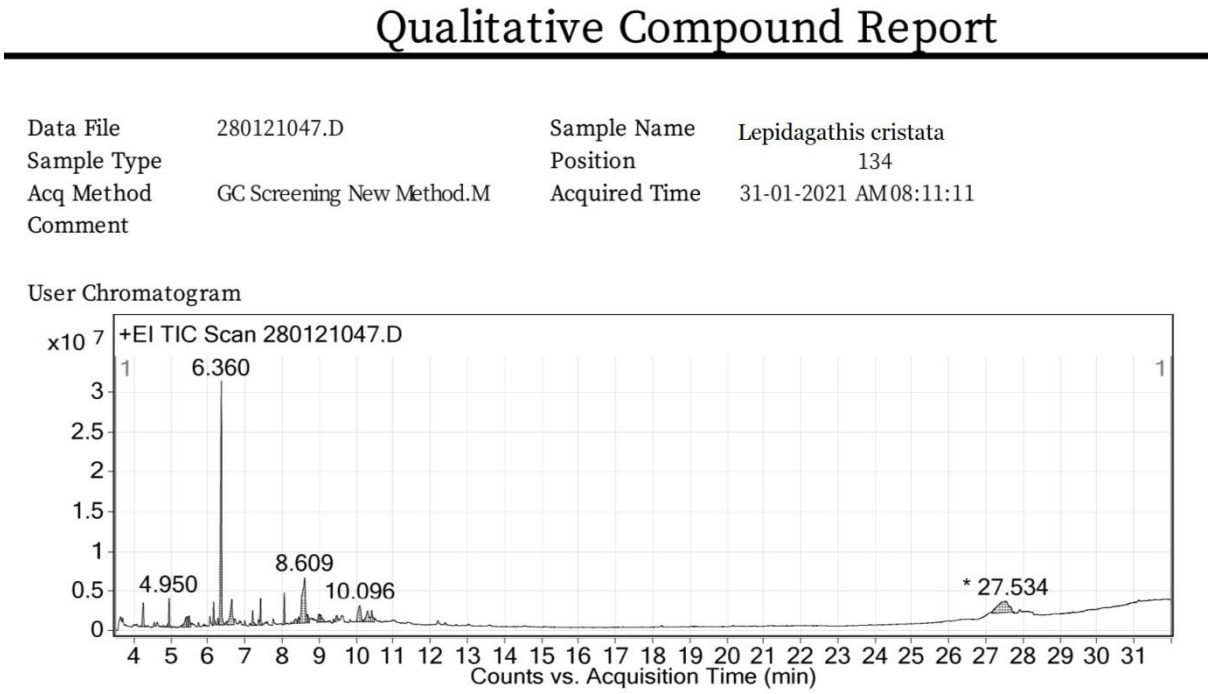


Table1. Indicates the retentions time, types of possible compound, molecular formula, molecular mass, percentage peak area and the possible medicinal roles of each compound as shown in the GC MS profile of*Lepidagathiscristata*

| Ret. Time | Compound | Mol. formula | Mol. Mass | % Peak Area | Possible Medicinal Role |
|---|---|---|---|---|---|
| 4.25 | Thymine | C5H6N2O2 | 126 | 2.89 | Precursor of Nucleotide synthesis |
| 4.95 | trans-3-Methyl-2-n-propylthiophane | C8H16S | 144.1 | 2.44 | Catechol-O-Methyl-Transfearse inhibitor, Increases Glutathione-s-Transferase Activity, Decrease Glutamate Oxaloacetate transaminase activity, Decreases Glutamate pyruvate |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | transaminase, Glycosyltransferase inhibitor, Glutathione-S-Transfearse inhibitor, Increases glyoxalate transamination, Reverse transcriptase inhibitor, 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 |
| 5.41 | .beta.-l-Arabinopyranoside, methyl | C6H12O5 | 164.1 | 1.89 | 17-beta-hydroxysteroid dehydrogenase inhibitor, Antiamyloid-Beta, Anti TGF-Beta, Beta-2-Receptor-Agonist, Beta-Adrenergic receptor blocker, Beta Galactosidase inhibitor, Beta-Glucuronidase inhibitor, Aldehyde oxidase inhibitor, 12 Lypoxygease inhibitor, anti LDL, Anticancer |
| 5.46 | 1,3,5,7-Tetroxane | C4H8O4 | 120 | 1.76 | Not known |
| 5.49 | 4-(Methylthio)-1-butene | C5H10S | 102.1 | 1.61 | Not known |
| 6.15 | Aluminum, triethyl- | C6H15Al | 114.1 | 1.93 | Antidote for Aluminium |
| 6.36 | Acetic acid, trifluoro-, anhydride | C4F6O3 | 210 | 29.20 | Acidifier, Arachidonic acid Inhibitor, Increases Aromatic Amino acid decarboxylase activity, Inhibits production of uric acid, Urine acidifier |
| 6.64 | 1,2,4-Cyclopentanetrione, 3-methyl- | C6H6O3 | 126 | 6.30 | Catechol o methyl Transferase inhibitor, methyl donar, methyl guanidine inhibitor |
| 7.20 | Methyl 2,3-anhydro-.beta.-d-ribofuranoside | C6H10O4 | 146.1 | 1.70 | 17 beta hydroxysteroid dehydrogenase inhibitor, Antiamyloid beta, Anti TGF beta, Beta receptor agonist, Beta-adrenergic receptor blocker, beta blocker, beta galactosidase inhibitor, beta glucuronidase inhibitor, ER beta binder, smart drug, anticancer |
| 7.42 | 1-Propene, 3,3-diethoxy- | C7H14O2 | 130.1 | 2.48 | Not known |

| | | | | | |
|---|---|---|---|---|---|
| 8.06 | Cyclobutanecarboxylic acid, cyclobutyl ester | C9H14O2 | 154.1 | 2.54 | Acidifier, Arachidonic acid Inhibitor, Increases Aromatic Amino acid decarboxylase activity, Inhibits production of uric acid, Urine acidifier |
| 8.37 | 1-Butanol, 4-[(tetrahydro-2H-pyran-2-yl)oxy]- | C9H18O3 | 174.1 | 1.06 | Not known |
| 8.45 | 4-Methylnonanoic acid | C10H20O2 | 172.1 | 0.90 | Acidifier, Arachidonic acid Inhibitor, Increases Aromatic Amino acid decarboxylase activity, Inhibits production of uric acid, Urine acidifier |
| 8.61 | Borinic acid, diethyl- | C4H11BO | 86.1 | 15.08 | Acidifier, Arachidonic acid Inhibitor, Increases Aromatic Amino acid decarboxylase activity, Inhibits production of uric acid, Urine acidifier |
| 8.69 | 1,2,4-Benzenetriol | C6H6O3 | 126 | 1.00 | Not known |
| 8.99 | Methyl 2,6-anhydro-.alpha.-d-altroside | C7H12O5 | 176.1 | 1.06 | 5 alpha reductase inhibitor, alpha amylase inhibitor, alpha glucosidase inhibitor, Alpha reducatse inhibitor, HIF 1 alpha inhibitor, IKappaka B alpha phosphorylation inhibitor, increases alpha mannosidase activity, Interlukin 1 alpha inhibitor, 17 beta hydroxysteroid dehydrogenase inhibitor, Testosteron 5 alpha reductase inhibitor, Alcohol dehydrogenase inhibitor, smart drug, |
| 9.48 | Sulfurous acid, cyclohexylmethylheptadecyl ester | C24H48O3S | 416.3 | 1.16 | Acidifier, Arachidonic acid Inhibitor, Increases Aromatic Amino acid decarboxylase activity, Inhibits production of uric acid, Urine acidifier |
| 10.10 | 1-Hexanol, 2-(hydroxymethyl)- | C7H16O2 | 132.1 | 5.02 | Not known |
| 10.31 | Dodecane, 1-fluoro- | C12H25F | 188.2 | 4.97 | Not known |
| 10.42 | n-Hexadecanoic acid | C16H32O2 | 256.2 | 2.00 | Acidifier, Acidulant, Arachidonic acid-Inhibitor, Increase Aromatic Amino Acid Decarboxylase Activity, Inhibit Production of Uric Acid, Urinary-Acidulant, Anaphylactic, Arylamine-N-Acetyltransferase-Inhibitor, |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | Decrease Norepinephrine Production, Down regulation of nuclear and cytosol androgen reuptake, GABA-nergic, Increases Natural Killer (NK) Cell Activity, Inhibit Production of Tumor Necrosis Factor, Inhibit Production of Tumor-Necrosis-Factor, Myo-neuro-stimulant |
| 27.53 | .beta.-D-Mannothiofuranoside, S-n-octyl- | C14H28O5S | 308.2 | 13.00 | 17-beta-hydroxysteroid dehydrogenase-Inhibitor, Myo-neuro-stimulant, Nitric-Oxide-Synthase-Inhibitor. NO-Scavenger, Stimulate Norepinephrine Production, smart drugDNAsparging, Stimulate Sympathetic Nervous System, Decrease Norepinephrine Production, Down regulation of nuclear and cytosol androgen reuptake, Increase Superoxide Dismutase Activity, Stimulate PUFA Desaturase and Elongase Enzymes, Succinate-Dehydrogenase-Inhibitor, Systolic-Depressant |