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# 'The Gc Ms Analysis Of Ethyl Acetate Extract Of One Herbal Plant, 'Cyanotis Tuberosa'

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**ABSTRACT**

The present study deals with the GC MS analysis of one medicinal plant, Cyanotistuberosa'. Not much work was done on this species and it is of interest to learn about the medicinal value since ethnophrmaclogical reports on this plant are also scanty. The plant was collected from nearby hills of Chengalpattu, Tamilnadu. The ethyl acetate extract of the tuber of the plant was subjected to GC MS study following standard protocols. It was observed that some very important molecules such as3,7,11,15-Tetramethyl-2-hexadecen-1-ol, n-Hexadecanoic acid, -((Octan-2-yloxy)carbonyl)benzoic acid, Cholesterol, 3H-Isobenzofuran-1-one, 6,7-dimethoxy-3-p-tolylamino- Further probe is warranted to known about the medicinal role of this plant in the light of the present report.

**Keywords** GC MS, Cyanotistuberosa**,** 3,7,11,15-Tetramethyl-2-hexadecen-1-ol, n-Hexadecanoic acid,, Cholesterol, 3H-Isobenzofuran-1-one

## INTRODUCTION

The plant, Cyanotistuberosa is found in the hill regions and grows during monsoon. The tubers are perennial and they produce fresh aerial shoot every season. No scientific reports are available on the medicinal role of this plant and ethno-botanically also there are very scanty reports on its medicinal

value. Ghosh and Chowdhury, 2016 have reported the pharmacognosy and phytochemical analysis of Cyanotistuberosa. Therefore this plant was chosen for our study. The plant along with the tuber was collected from the hills near Chengalpattu,Tamil Nadu, and the ethyl acetate extract of the tuber was subjected to GC MS analysis following standard protocols. This work is in continuation of our endeavor to substantiate the medicinal roles of 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, Cyanotistuberosa was collected from the nearby hills of Chengalpttu, 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 of Cyanotistuberosa ethyl acetate extract, along with the possible medicinal role of each molecule are tabulated in Table 1. Figure 1 represents the GC-MS profile of ethyl acetate extract of the whole plant of Cyanotistuberosa. 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. Some molecules as represented by the GC MS profile indicated the presence of some important biomolecules such as 3,7,11,15-Tetramethyl-2-hexadecen-1-ol, n-Hexadecanoic acid, -((Octan-2-yloxy)carbonyl)benzoic acid, Cholesterol, 3H-Isobenzofuran-1-one, 6,7-dimethoxy-3-p-tolylamino- Further probe is warranted to known about the medicinal role of this plant in the light of the present report.

**CONCLUSION**

Thus it can be concluded that due to the presence of these molecules, Cyanotistuberosahas some the medicinal roles and it should be explored as a possible medicine. Further work to isolate and understand the molecular mechanism is warranted.

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**REFERENCES**

1. Ghosh, P., Chowdhury, H. R. (2016) Pharmacognostic studies and phytochemical screening of aerial and root parts of Cyanotistuberosa (roxb.) schult. &schult.f. - An ethno-medicinal herb. World Journal of Pharmaceutical Research 5(2), 1580-1601.

2. MutteviHyagreva Kumar, Prabhu, K, Mudiganti Ram Krishna Rao, Lakshmisundram, R, Sampad, Shil, Sathish Kumar, M., Vijayalakshmi, N.(2020)The GC MS study of one medicinal plant, Aristolochiaindica. DIT, 12(12), 2919-2923.

3. GomathiPriyadarshini, Arul Amutha Elizabeth, Jacintha Anthony, Mudiganti Ram Krishna Rao, Prabhu, K., Aiswarya Ramesh, Vani Krishna. (2017) The GC MS analysis of one medicinal plant, Premnatomentosa. Journal of Pharmaceutical Sciences and Research, **9(9),** 1595-1597

4. Jayakumari, S., Prabhu, K., Mudiganti Ram Krishna Rao, Bhupesh, G., Kumaran, D., Aishwariya Ramesh. (2017) The GC MS Analysis of a Rare Medicinal Plant Aloe barbadensis. J. Pharm. Sci. & Res.9(7), 1035-1037

5. Rao, M. R. K., Vijayalakshmi, N. (2018) Preliminary phytochemical and GC MS analysis of different extracts of Sphaeranthusindicus leaves. Indo American J of Pharmaceuical Sciences, 5(3), 1511-1520

6. Vijayalakshmi, N., Mudiganti Ram Krishna Rao. (2019) The antioxidant studies of two medicinal plants, Sphaeranthusindicusand Psophocarpustetragonolobus.Asian J of pharmaceutical and Clinical Res, 12(1), 321-327.

7. Yuvaraj, R., Mudiganti Ram Krishna Rao, Prabhu, K., Lakshmisundram, R., SampadShil, Sathish Kumar, M., Vijayalakshmi, N. (2019)The GC MS study of one medicinal plant, Stachyterphetaindica.Drug Invention Today, 12(9), 1665-1669

8. MutteviHyagreva Kumar, Prabhu, K., Mudiganti Ram Krishna Rao, Lakshmisundram, R., SampadShil, Sathish Kumar, M., Vijayalakshmi, N. (2019)The GC MS study of one medicinal plant, Dodoneaangutifolia. Drug Invention Today, 12(9), 1661-1664

9. Mudiganti Ram Krishna Rao, Vijayalakshmi, N., Prabhu, K., Sathish Kumar, M. (2019)The gas chromatography–mass spectrometry study of Moringaoleiferaseeds. DIT, 12(10), 2172-2175

10. MutteviHyagreva Kumar, Prabhu, K., Mudiganti Ram Krishna Rao, Lakshmisundram, R., SampadShil, Sathish Kumar, M., Vijayalakshmi, N.(2020)The GC MS study of one medicinal plant, AristolochiaIndica .DIT, 12(12), 2919-2923.

11. Vijayalakshmi, N., Mudiganti Ram Krishna Rao. (2020) 'Preliminary phytochemical and antioxidant studies of leaf extracts of one medicinal plant, Vitexnegundo".RJPT, 13(5), 2167-2173

12. Janaki C. S.', Prabhu K., Mudiganti Ram Krishna Rao,VenkatRamaiah, ShrutiDinkar, Vijayalakshmi, N., Kalaivannan. J. (2021) The GC MS analysis of Ethyl acetate extract of Merremiaemerginata'.Ind J of Natural Sciences, 12(67), 33638-33646

13. Perumal, G. M., Prabhu, K., Rao, M. R. K..Janaki, C. S., Kalaivannan, J., Kavimani, M. (2021) The GC MS analysis of Ethyl acetate extract of 'Flueggealeucopyrus.Nat. Volatiles & Essential Oils, 8(5), 4035-4040

14. Dr. Duke's Phytochemcial and Ehnobotanical Databases.U.S. Department of Agriculture, Agricultural Research Service.1992-2016. Dr. Duke's Phytochemical and Ethnobotanical Databases.

Home Page, http://phytochem.nal.usda.gov/ http://dx.doi.org/10.15482/USDA.ADC/1239279

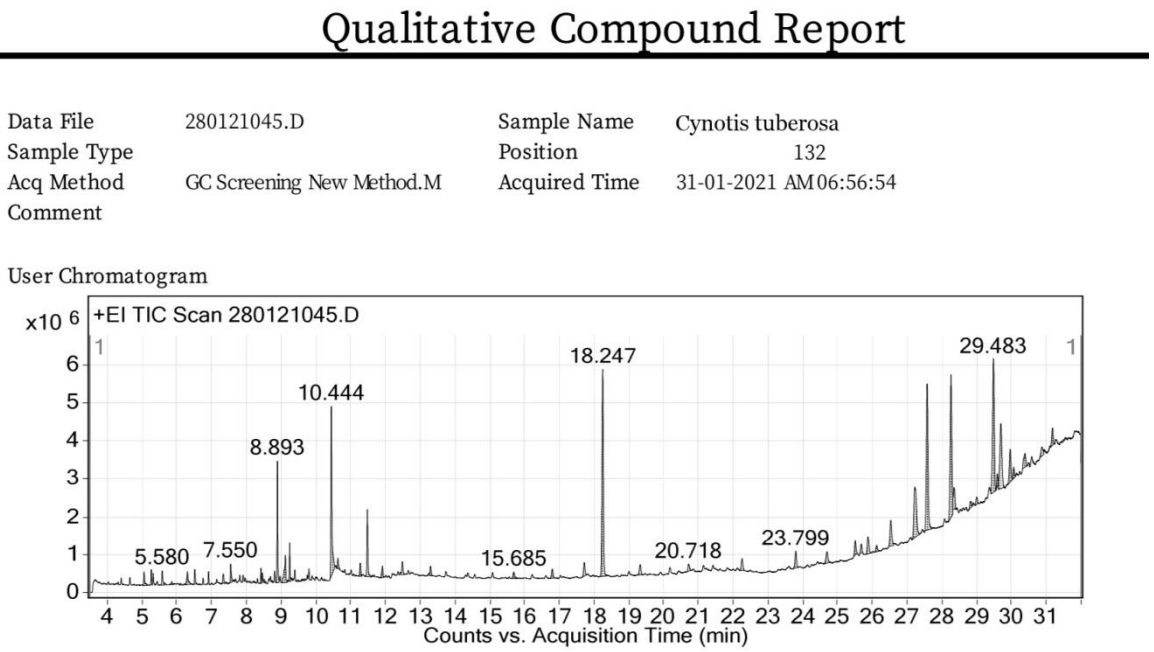


Figure 1. Represents the GC MS graph of ethyl acetate extractCyanotistuberosa

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 of Cyanotistuberosa

| Ret. Time | Molecules | Mol. Formula | Mol. Mass | % Peak area | Possible Medicinal Role |
|---|---|---|---|---|---|
| 8.89 | 1-Hexadecyne | C16H30 | 222.2 | 3.91 | Not Known |
| 9.12 | 9-Octadecyne | C18H34 | 250.3 | 1.82 | Not Known |
| 9.25 | 3,7,11,15-Tetramethyl-2-hexadecen-1-ol | C20H40O | 296.3 | 1.23 | Oligosaccharide provider |
| 10.44 | n-Hexadecanoic acid | C16H32O2 | 256.2 | 7.98 | 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 | 2.93 | Not known |
| 18.25 | 2-((Octan-2-yloxy)carbonyl)benzoic | C16H22O4 | 278.2 | 13.35 | Acidifier, Arachidonic acid inhibitor, Increases Aromatic |

| | | | | | |
|---|---|---|---|---|---|
| | acid | | | | Amino acid Decarboxylase activity |
| 23.80 | 3-Eicosyne | C20H38 | 278.3 | 1.16 | Not known |
| 25.88 | Cholesterol | C27H46O | 386.4 | 1.33 | The precursor for steroid hormone synthesis |
| 26.53 | 3H-Isobenzofuran-1-one, 6,7-dimethoxy-3-p-tolylamino- | C17H17NO 4 | 299.1 | 2.10 | 11Beta HSD inhibitor, 17-beta-hydroxysteroid dehydrogenase inhibitor, 5 HETE inhibitor, 5 HT inhibitor, 8 HETE inhibitor, Anti 5-HT, Anti HIV integrase, Aryl hydrocarbon hydroxylase inhibitor, HDL genic, Hematopoietic |