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Research Article

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GC-MS Analysis of *Nothapodytes nimmoniana* [J. Graham] Mabberly leaves

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ABSTRACT

GC-MS analysis was carried out for the identification of the phytochemicals present in the methanolic leaf extract of .Nothapodytes nimmoniana. It indicates that the leaf extract is rich in phenolics, fatty acids, flavonoids and antioxidants. GC-MS analysis of methanol extract to identification of 26 compounds. The main compounds, were 9,12,15-Octadecatrienoic acid, [Z,Z,Z] is a compound name Linolenic acid used for Antiinflammatory, antiarthritic, anticoronary and anticancer,etc.

Key Words: GC-MS analysis, *Nothapodytes nimmoniana* , Linolenic acid, Antiinflammatory, Anticoronary.

INTRODUCTION

Plants are important sources of medicines and presently about 25% of pharmaceutical prescriptions. In the last century, roughly 121 pharmaceutical products were formulated based on the traditional knowledge obtained from various sources. Plant derived drugs came into use in the modern medicine through the uses of plant material as indigenous cure in folklore or traditional systems of medicine. The world is now moving towards the herbal medicine [5]. *Nothapodytes nimmoniana* is a medicinal plant belonging to the Icacinaceae family. The species is polygamous in nature with a wide array of breeding types including male, female, hermaphrodite, monoecious, andromonoecious, gynomonoecious, and trimonoecious trees.[3]

It is a shrubby small tree, with broad dark green leaves and flowers distributed naturally in Western Ghats of India and some parts of Assam, Himalayan foot hills, Ceylon, Burma and Thailand. *Nothapodytes nimmoniana* is an important medicinal plant used in various types of cancer, for HIV,in malaria and as antibacterial agent[4]. As the herb is used widely in the Indian traditional system, it was thought worthwhile to undertake the studies to evaluate the secondary metsbolites n the shrub.

Gas chromatography / mass spectroscopy [GC/MS] combines two analytical techniques to a single method of analyzing mixtures of chemical compounds. Gas chromatography separates the components of the mixture, and mass spectroscopy analyzes each of the components separately. GC/MS is extensively used in medical, pharmaceutical, environmental, and forensic applications.

It has been found that *Nothapodytes nimmoniana* contains compounds having anticancer and antiviral properties[1]. linolenic acid is an essential omega-3 fatty acid. It is called “essential” because it is needed for normal human growth and development. Nuts, such as walnuts, are good sources of linolenic acid. It is also found in vegetable oils such as flaxseed (linseed) oil, canola (rapeseed) oil, and soybean oil, as well as in red meat and dairy products, etc.

It is used to prevent heart attacks, lower high blood pressure, lower cholesterol, and reverse "hardening of the blood vessels" (atherosclerosis). Other uses include treatment of chronic obstructive pulmonary disease (COPD), migraine headache, skin cancer, depression, and allergic and inflammatory conditions such as psoriasis and eczema. Some people use alpha-linolenic acid to prevent cancer. Ironically, alpha-linolenic acid may actually raise some men's risk of getting prostate cancer.

EXPERIMENTAL SECTION

Plant Material

Plant material of *N.nimmoniana*[Grah.] Mabb. was collected from Siruvani hill, Coimbatore district, Tamilnadu, during the month of December 2011. The plant specimens was identified with Gambles Flora of the Presidency of Madras and the identity is confirmed with the herbarium specimen deposited in Kongunadu Arts and Science college herbarium, Coimbatore

Preparation of the Extract

Plant materials leaf was washed with distilled water and shade dried. The dried samples were manually ground to a fine powder. The coarsely powdered parts were exhaustively extracted with methanol for 8 hr using Soxhlet apparatus. The extract contains both polar and non-polar components of the material and 2ul sample of the solution was employed in GC-MS for analysis of different compounds.

GC-MS ANALYSIS:

Quantitative and qualitative data were determined by GC and GC-MS, respectively. The column used was DB-5ms Agilent Length :30.0m, Diameter:0.25mm Film Thickness : 0.25um, operated with the following column oven temperature 70°C and Injector Temperature 240 °C and respectively; injection mode, split; split ratio,10 carrier gas, helium at 99.9995% purity, Injection volume1 microlitre. The Agilent 5975C GC/MS combines the 5987C MSD 'Triple Axis Detector with the 7890 GC. It is further equipped with both a CTC_autosampler_with a headspace option, and a Tekmar Stratum Purge and Trap Concentrator . Helium was used as the carrier gas. The MS operating conditions were: Ion source temp : 200 °C Interface temp: 240° Scan range : 40 – 1000 m/z Solvent cut time: 5mins The GC operating parameters were identical with those of GC analysis described above.

RESULTS AND DISCUSSION

The studies on the active principles in the *N. nimmoniana* leaf Methanolic extract by GC-MS analysis clearly showed the presence of 26 compounds [Tab-1].The active principles with their retention time [RT] and concentration [peak area%]are presented in [Table-1.]The GC-MS chromatogram of the seven peaks of the compounds detected was shown in Figure-1.Chromatogram GC-MS analysis of the methanol extract of *N.nimmoniana.* Showed the presence of major peaks and the components corresponding to the peaks were determined as follows, 26 compounds were detected in methanolic extracts of *N.nimmoniana*. The results revealed that 9,12,15-Octadecatrienoic acid was found as the one major component is the methanol extract and the ten minor components such as 1,3,5-Triazine-2,4,6-triamine , 2,5-Furandicarboxaldehyde , Undecane , 5-Hydroxymethylfurfural , Dodecanoic acid , 3-Pentanol, 2,3-dimethyl-, alpha.-Methyl mannofuranoside , 9,12-Octadecadienoic acid [Z,Z], Hexadecanoic acid, 2-hydroxy-1, Vitamin E.

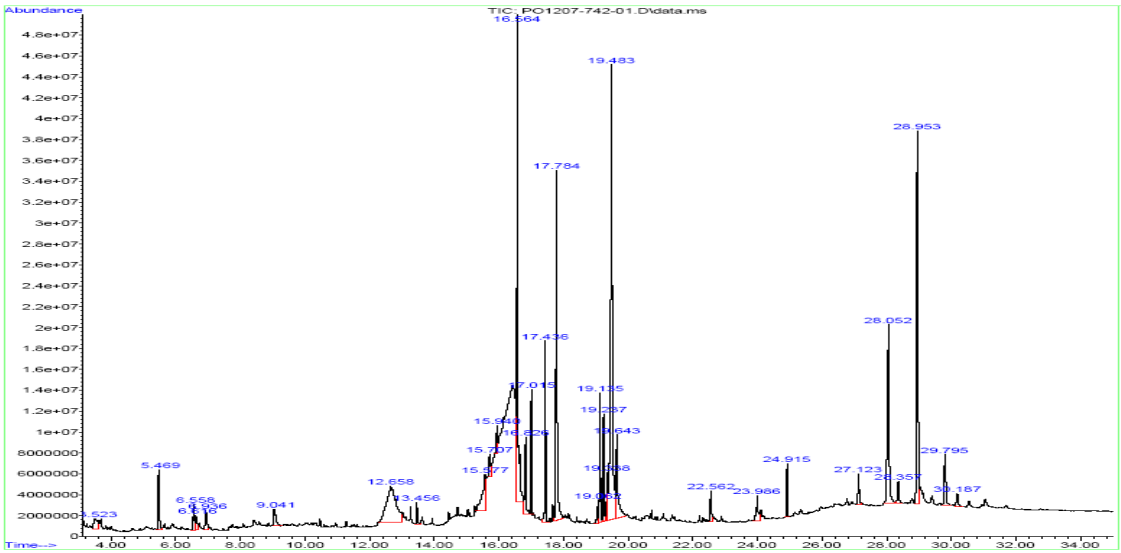
9,12,15-Octadecatrienoic acid, (Z,Z,Z)major compound name is Linolenic acid. Prostate cancer. There is contradictory evidence about the role of alpha-linolenic acid in prostate cancer. Some research suggests that high dietary intake of alpha-linolenic acid might increase the risk of getting prostate cancer. But other research finds no increased risk. The source of alpha-linolenic acid seems to be important. Alpha-linolenic acid from dairy and meat sources has been positively associated with prostate cancer. Alpha-linolenic acid from plant sources, such as flaxseed, does not affect prostate cancer risk.

The GC-MS spectrum shows the presence of more long chains hydrocarbons. When the number of carbon atoms increases in the molecule,hydophilicity is reduced and the lipophilicity is increased.Increased lipophilicity of a drug decreases its transport across intestinal epithelial cells[2].

TABLE . 1 GC-MS Analysis of *Nothapodytes nimmoniana*

S.No	Retention Time	Compound	Peak Area
1	3.523	Dihydroxyacetone	1.01
2	5.469	1,3-Butanediol, 2-methyl-	1.48
3	6.558	1,3,5-Triazine-2,4,6-triamine	0.69
4	6.616	2,5-Furandicarboxaldehyde	0.62
5	6.936	Undecane	0.72
6	9.041	5-Hydroxymethylfurfural	0.89
7	12.658	6,8-Dioxa-3-thiabicyclo[3,2,1]oc...	7.80
8	13.456	Dodecanoic acid	0.53
9	15.577	Thiophene, tetrahydro-2-methyl-	3.14
10	15.707	3-Pentanol, 2,3-dimethyl-	0.64
11	15.940	alpha.-Methyl mannofuranoside	0.70
12	16.564	Bicyclo[3.1.1]heptane, 2,6,6-tri...	11.37
13	16.826	Cyclohexanol, 1-ethynyl-	1.86
14	17.015	2-Cyclohexen-1-one, 4,4-dimethyl-	2.40
15	17.436	Hexadecanoic acid, methyl ester	3.08
16	17.784	n-Hexadecanoic acid	9.34
17	19.062	9,12-Octadecadienoic acid [Z,Z]-...	0.53
18	19.135	9,12,15-Octadecatrienoic acid, m...	2.85
19	19.237	Phytol	2.46
20	19.338	Methyl stearate	1.16
21	19.483	9,12,15-Octadecatrienoic acid	17.40
22	19.643	Octadecanoic acid	3.08
23	22.562	Hexadecanoic acid, 2-hydroxy-1-	0.83
24	23.986	cis,cis,cis-7,10,13-Hexadecatrienal	1.00
25	24.915	Squalene	1.17
26	27.123	Vitamin E	0.89

FIGURE . 1 GC-MS Analysis of *Nothapodytes nimmoniana.*



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