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GC-MS Analysis Of Phytochemical Compounds Present In The Chloroform Extract Of *Viburnum punctatum* Buch-Ham Ex D.Don.

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ABSTRACT

The aim of this study was to carry out for identification of bioactive compounds from the chloroform extract of *Viburnum punctatum* by Gas chromatography and Mass spectroscopy (GC-MS), The GC-MS analysis revealed the presence of various compounds like 4 (1H) pyrimidinone 6-hydroxy (RT: 13.92 & Area%: 30.27), β-D-glucopyranose 1,6 anhydro (RT: 14.15 & Area%: 22.15), Cyclododecane (RT: 14.82 & Area%: 14.54), Methyl-d-glycero-β-guloheptoside (RT: 14.50 & Area%: 11.15), Muco-inositol (RT: 16.52 & Area%: 9.64), Phthalic acid 2-cyclo hexyl ethyl butyl ester (RT: 16.69 & Area%: 3.75) and D-Talonic acid lactone (RT: 18.10 & Area%: 2.31) in the chloroform extract of *Viburnum punctatum*. Further studies are needed to isolate active compounds of the extract as well as to explicate their exact mechanism of action in various disorders.

Keywords: *Viburnum punctatum,* GC-MS, Phytochemical Compounds.

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INTRODUCTION

A diverse range of bioactive molecules are produced by the plant which makes them an enriched source of different varities of medicines. The ancient scholastic works included in the Atharva veda, charaka and sushruta comprises a rich heritage of knowledge to preventive and curative medicines Natural products plays important role in drug development programs in the pharmaceutical industry [1] and almost 50% of all modern drugs are of natural Origin [2], Due to the efficacy and cost effectiveness of Herbal drugs, it gained much importance in the recent years.

The present study on the medicinal plant namely *Viburnum punctatum* belongs to the family Caprifoliaceae and this plant is small tree, monotypic genus *Viburnum*, native to India, Indonesia, Bhutan, Cambodia, Nepal, Thailand, Vietnam and China. Asian *Viburnum* features dainty lymes of creamy white flower at the ends of the branches form early to mid-spring. It has dark green foliage throughout screen. The red fruits are held abundance in spectacular clusters in mid-summer, expected to live for 40 years or more [3, 4]. The leaves were traditionally used for the treatment for fever, stomach disorder and mentioned to possess antiperiodic effect. The preliminary phytochemical investigation shows presence of flavonoids, alkaloids, glycosides, phenolic compounds, phytosterols and saponins [5, 6].

Figure 1: The Plant *Viburnum Punctatum*

In the last few years, Gas chromatography-mass spectrometry (GCMS) has become firmly established as a key technological platform for secondary metabolite profiling in both plant and non-plant species [7, 8, 9].

Gas chromatography-mass spectrometry (GC-MS) is a method that combines the features of gas-liquid chromatography and mass spectrometry to identify the different substances within a test sample. However, few reports are available with respect to the pharmacological properties of the plant [10]. Keeping this in view, the present study has been undertaken to identify the phytochemical compounds present in chloroform extract of *Viburnum punctatum* using GC-MS analysis.

MATERIALS AND METHODS

Plant Material

Aerial parts of *Viburnum punctatum* were collected from Kalakkad-Mundenthurai, Thirunelveli in the month of June 2013. The plant was authenticated by Prof. V. Chellathurai, Former Professor, Govt. Sidha

Medical College, Thirunelveli. A voucher specimen of *Viburnum punctatum* was registered number is VPC-III /09/2013/14. The plant material was dried at room temperature, pulverized by a mechanical grinder, sieved through 40 mesh and stored in an air tight and light resistant container for further use.

Preparation of Extract

The coarsely powdered plant material was first defatted with Petroleum ether using soxhlet apparatus. The extract was concentrated using rotary evaporator to get solid residue. The marc from the central compartment was removed, dried and successively extracted with a series of solvents of increasing polarity with soxhlet extractor was done. Solvents used with increasing polarity are Chloroform, Methanol and Water [11, 12].

GC-MS Analysis

The phytochemical investigation of methanol chloroform extract of *Viburnum punctatum* was performed on a GC-MS-5975C (AGILENT) instrument.

GC CONDITION	
Column oven Temperature	**70°C**
Injector Temperature	**240°C**
Injector Mode	**Split**
Split Ratio	**10**
Flow Control Mode	**Linear Velocity**
Column Flow	**1.51 ml/min**
Carrier Gas	**Helium 99.9995% purity**
Injection Volume	**1 microlitre**

MS CONDITION	
Ion Source temp	**200°C**
Interface temp	**240°C**
Scan Range	**40-1000m/z**
Solvent cut time	**5 mins**
MS Start time	**5 (min)**
MS End time	**35 (min)**
Ionization	**EI (-70ev)**
Scan speed	**2000**

Identification of components

Total GC running time was 24 min and the interpretation on mass spectrum of GC-MS was done using the database of National Institute Standard and technology (NIST). The mass spectrum of the unknown component was compared with the spectrum of the known components stored in the NIST. The name, molecular weight and structure of the components of the test materials were ascertained [13, 14].

RESULTS AND DISCUSSION

GC-MS chromatogram of the chloroform extract of *Viburnum punctatum* showed 11 peaks indicating the presence of 11 compounds. The chemical compounds identified in the chloroform extract of the aerial parts of *Viburnum punctatum* presented in table 1. GC-MS analysis revealed that the presence of 1,2,3,4-butanetetrol, β-methyl xyloside, phthalic acid 2-cyclo hexyl ethyl butyl ester, d-talonic acid lactone, 1H-indole 5-methyl 2-phenyl, bis (2-ethyl hexyl) phthalate are showed as minimum percent. Methyl-d-glycero-β-guloheptoside, cyclododecane, muco-inositol are recorded predominantly. 4 (1H) pyrimidinone 6-hydroxy and β-D-glucopyranose 1, 6 anhydro are maximum percent. The GC-MS analysis revealed that the chloroform extract is mainly composed of oxygenated hydrocarbons, phenolic hydrocarbons and nitrogen containing compounds. These phytochemicals are responsible for various pharmacological actions like antimicrobial and antioxidant activities.

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Viburnum punctatum is a potential folklore medicinal plant used for many diseases and infections. Phytochemical analysis by GC-MS revealed the presence of fatty acid amide, phenolic compounds, oxygenated hydrocarbons and nitrogen containing compounds as major compounds in chloroform fraction. Compositional variation in quantities, qualitities and structural features may influence compounds behaviour on GC-MS as well as bioactivities of their precursor fractions.

Table 1: Phytocomponents identified in the chloroform extract of *Vburnum punctatum* by GC-MS Peak report.

RT	Compound Name	Molecular Formula	Molecular Weight	Area %
6.80	1,2,3,4-Butanetetrol	$C_4H_{10}O_4$	122.12	1.95
12.51	β-methyl xyloside	$C_6H_{12}O_5$	164.15	1.72
13.92	4 (1H) pyrimidinone 6-hydroxy	$C_4H_4N_2O_2$	112.08	30.27
14.15	β-D-glucopyranose 1,6 anhydro	$C_6H_{10}O_5$	162.14	22.15
14.50	Methyl-d-glycero-β-guloheptoside	$C_7H_{14}O_6$	194.18	11.15
14.82	Cyclododecane	$C_{12}H_{24}$	168.32	14.54
16.52	Muco-inositol	$C_6H_{12}O_6$	180.15	9.64
16.69	Phthalic acid 2-cyclo hexyl ethyl butyl ester	$C_{20}H_{28}O_4$	332.44	3.75
18.10	D-Talonic acid lactone	$C_6H_{10}O_3$	178.14	2.31
22.53	1H-indole 5-methyl 2-phenyl	$C_{15}H_{13}N$	207.27	0.69
22.66	Bis (2-ethyl hexyl) phthalate	$C_{24}H_{38}O_4$	390.56	1.84

File :D:\NOV-12\20-11-12\7812324-0049.D
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Instrument : GCMS
Sample Name: 2:1 SAMPLE
Misc Info :
Vial Number: 4

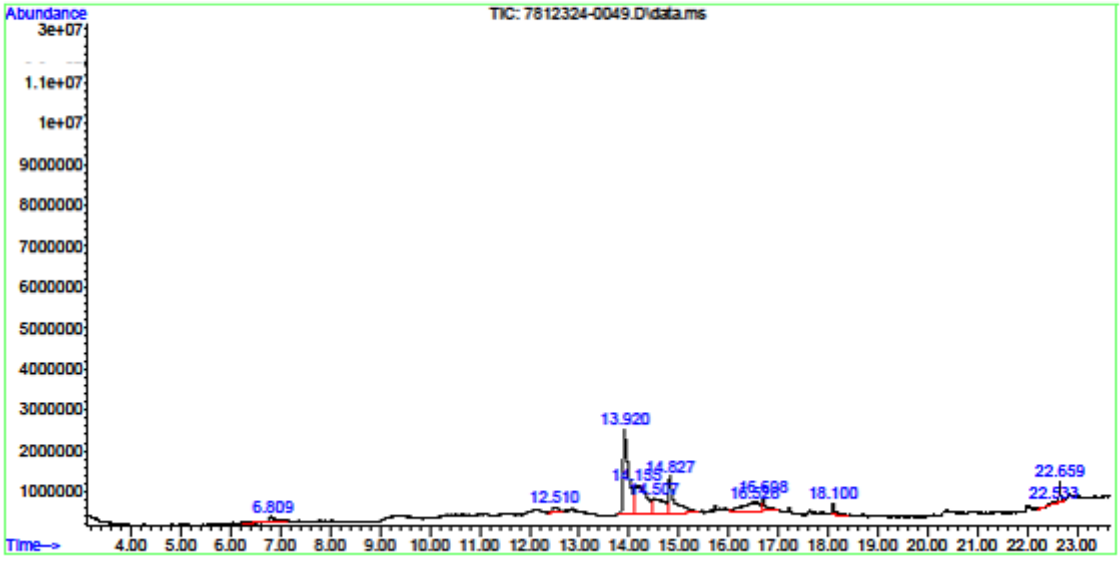

Figure 2: GC-MS Profile of chloroform extract of *Vburnum punctatum*

REFERENCES

[1] Baker JT, Borris RP and Carte B. J.Nat.Prod 1995; 65: 1325-1357.
[2] Stuffiness M, Douros J. J.Nat.Prod 1982; 45: 1-14.

[3] Govt of India. "The Wealth of India" Raw Materials, Publications and Information, Directorate (CSIR), New Delhi, 2003, pp. 437-446.
[4] Gamble JS. "Flora of the Presidency of Madras" Botanical Survey of India, Culcutta. 1995, pp. 1-3.
[5] Prabhu K, Karar PK, Hemalatha S and Ponnudurai K. J Pharm Sci Res 2009; 1: 43-50.
[6] Renjith Alex A, Ilango K. AJPCT 2013; 1 (4) : 416-423.
[7] Robertson DG. Metabonomics in toxicology. A review Toxicol.Sci 2005; 85: 809-22.
[8] Fernie AR, Trethewey RN, Krotzky AJ, Willmitzer L. Nat Rev Mol Cell Biol 2004; 5: 763-69.
[9] Kell DB, Brown M, Davey HM, Dunn WB. Nat Rev Microbiol 2005; 3: 557-65.
[10] Jayapriya G, Gricilda Shoba F. Journal of pharmacognosy and phytochenistry 2015; 4(1): 113-117.
[11] Trease GE, Evans WC. "Text Book of Pharmacognosy" 5th edition, London, Berilliee, Tindal. 2002, pp. 519-547.
[12] . Harbone JB. "Phytochemical methods" 3rd edition, Chapman and Hall London. pp. 49-52.
[13] Nezhadali A, Nabavi M, Akbarpour M. Der Pharma Chemica 2010; 1: 147.
[14] Sathyaprabha G, Kumaravel S, Panneerselvam A. Adv.Appl.Sci.Res 2011; 2: 51.