

Spectroscopic identification and GC-MS Analysis of *Merremia tridentata* roots for Anti diabetic and anti bacterial drug identification

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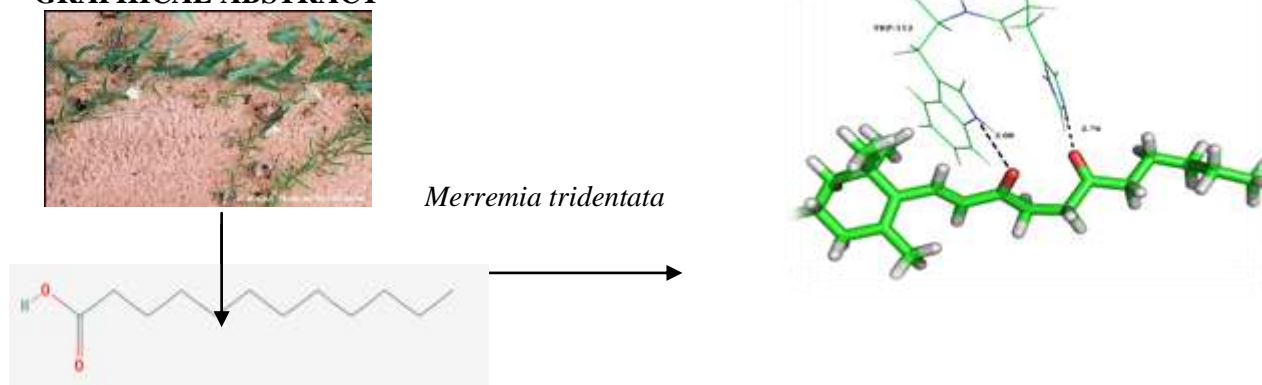
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Abstract : Methanol extracts of roots of *Merremia tridentata* using soxhlet device was my present study. The crude extracts was analysed by GC-MS, results need different peaks .Using standard reference from NIST, finding the presence of 10 phytochemical compounds with anti diabetic and antibacterial activities. The major phyto constituents were *Dodecanoic acid*(14.22), *Tridecanoic acid*, *12methyl-methyl ester* (15.05), undecanoic acid, 10methyl methyl ester, Tetra decanoic acid. Hexa decanoic acid, 14-methyl, methyl ester, 10-octa undecanoic acid, methyl ester(12.78), Nona decanoic acid, methyl ester, Heneicosanoic acid, 20-oxo methyl ester, Hexa decanoic acid, methyl ester(22.92), Hepta decanoic acid, 16-methyl 1methyl ester.s. Phytochemical analysis were made for the extracts to confirm the phytochemical existing in the roots. The isolated compound and its structural confirmation were made using FTIR –ATR techniques. The biological activities are based on pass online Databases. Isolation and Identification of antidiabetic and antibacterial compound helps to approach herbal as an alternate remedy.

Keywords: *Merremia tridentata*, Soxhlet extraction, FTIR-GC-MS, Anti-diabetic and antibacterial activity.

GRAPHICAL ABSTRACT



anti-diabetic protein target

Major phyto constituent

1. Introduction

Merremia Tridentata is belonging to convolvulaceae. ^[1]It have strong wound healing, anti-inflammatory and anti arthritic activities. My present aim was to investigate the phytochemical constituents. FT-IR, GC-MS techniques were find the antidiabetic activity of *Merremia Tridentata*. ^[2]Bioactive compounds were identified through extraction, purification, separation, isolation. Phenolic acids and saponins are the most important

factors for secondary metabolites. ^[3]It was applied by most conventional methods. ^[4, 5, 6]The roots from the *Merremia tridentata* was used for antidiabetic and anti bacterial. ^[7, 8]The functional groups are flavinoids, quinines, phenolic acids and saponins were identified^[9, 10].

2. Experimental

Collection and processing of plant material: The roots of *Merremia tridentata* were collected from the natural livings of Kanchipuram district, Tamil Nadu, India. In order to clean the gems, after cleaning, the roots were cut, shade dried, ground into fine powder using mechanical grinder and it could be kept in a permissible safety material.

Plant sample extraction: 250grams of powdered material was located inside a thimble made from thick filter paper, loaded into the main chamber of the soxhlet extractor. 2500ml of Methanol is also loaded into a chamber and flow in a condenser. Methanol, was heated to reflux. Methanol flows into part of an instrument like conical arm allow s a system using a solid. The device allowed to methanol vapour cools and drips back down. When the devices is completed level of methanol, in eight hours. Meanwhile methanol completed in full swing, solved and easily vapourized. After extraction the solvent is removed by rotary evaporator, and extracts collected for analyzing GC-MS.

FTIR Spectroscopic analysis: The extracts were examined under visible and UV light for closest analysis. In FTIR spectrophotometer analysis, the extracts were centrifuged at 3000 rpm for 10 min and filtered through Whatmann No. 1 filter paper by using high pressure vacuum pump. The sample is diluted to1: 10 with same solvent. The extracts were scanned in the wavelength ranging from 200-1100 nm by using Perkin Elmer Spectrophotometer system, which was used to detect the characteristic system and their functional groups. The peak values of FTIR were recorded. Each and every analysis was repeated twice for the spectrum confirmation.

GC-MS analysis: Extracts were performed in IICPT, Tanjore, Tamilnadu. 2 μ l of the solvent extract of *merremia tridentata* was employed. The device performed in the analysis as a fused capillary column packed with Elite-5MS [5%diphenyl, 95% dimethyl polysiloxane] 30 mm \times 0.25 mm ID \times 0.25 μ m df]; and the device were divided by Helium at a steady flow of 1 ml/min. Specimen were allowed to the device was found with 5.2 software. During the 36th minute this reaction was kept at 280 $^{\circ}$ C by keeping 720sec. Initially we set at 250 $^{\circ}$ C. Various criteria as included at 500 μ s. Mass spectra were taken at 70 eV in between 0-2 minutes and components ranges from 45 to 450 Da. The process was completed in 36minutes.

Preliminary phyto chemical screening: Freshly prepared extracts were allowed to a standard phyto chemical analysis to ensure major chemical components by standard descriptions.

Identification of compounds: Compounds were identified in area by bit by bit through NIST ver 2.0 year 2005.

3. Results

Phytochemical prospective:

Solvent extract of *Merremia tridentata* roots showed presence of flavinoids, quinines, phenolic acids, and saponins.

4. Discussion:

Preliminary phytochemical investigation confirmed presence of Alkaloid, saponins, phenolic compounds and tannins which establishes richness of plant in secondary metabolites. The results find outs, what are all the compounds available from our work patterns. It will found out through chromatogram. Recorded values from the methanol extraction proves for the responsible for antibacterial activity.

The FTIR spectrum was used to identify the functional group of the active components based on the peak value in the region of infrared radiation. The results of FTIR peak values and functional groups were represented in Table 1. Performing the next advanced phytochemical analysis technique of FTIR in the presence of various functional groups of different compounds was found. The solvent had its respective functional group like amines, cycloalkanes, carboxylic acids, Ethers, aldehydes, alkanes, Alkenes etc. hence, the crude extracts

subjected to FTIR analysis is used for the identification of chemical constituents present in *Merremia tridentata* is labeled in fig 1. In FTIR spectroscopy is proved to be suitable and sensitive method for detection of bio molecular composition.

GC-MS analysis was done using the organic solvent methanol and it showed the presence of 7 different chemical compounds present in the plant sample vide Table1, Fig.1. The sample was extracted with methanol because of the effect of antidiabetic and anti bacterial activity in this solvent. GC-MS analysis also provides the spectrum for the methanolic extract. From the chromatogram shows the presence of seven components with the retention time 11.56 & 21.85 respectively.

The phyto chemical screening chemical constituents of the plants studied showed that the roots were amino acids and secondary metabolites such as alkaloids, flavonoids. They have both therapeutic and physiological value GC-MS exhibit *Merremia tridentata* of relative concentrations of various compounds with a function of retention time were illustrated in the graph.

Table1:FTIR peak values and functional groups of methanol extracts of *Merremia tridentata*.L

S.No	Peak values	Functional group
1	2925.25	Alkene
2	2861.85	Alkene
3	2708.41	aldehydes
4	2322.24	Alkynes
5	2207.07	Alkynes
6	1395.09	Alkanes
7	1371.45	Alkanes
8	1352.72	Alkanes
9	1161.82	Alcohol,Ester,Ether,Carboxylic acid
10	162.56	Aliphatic amines

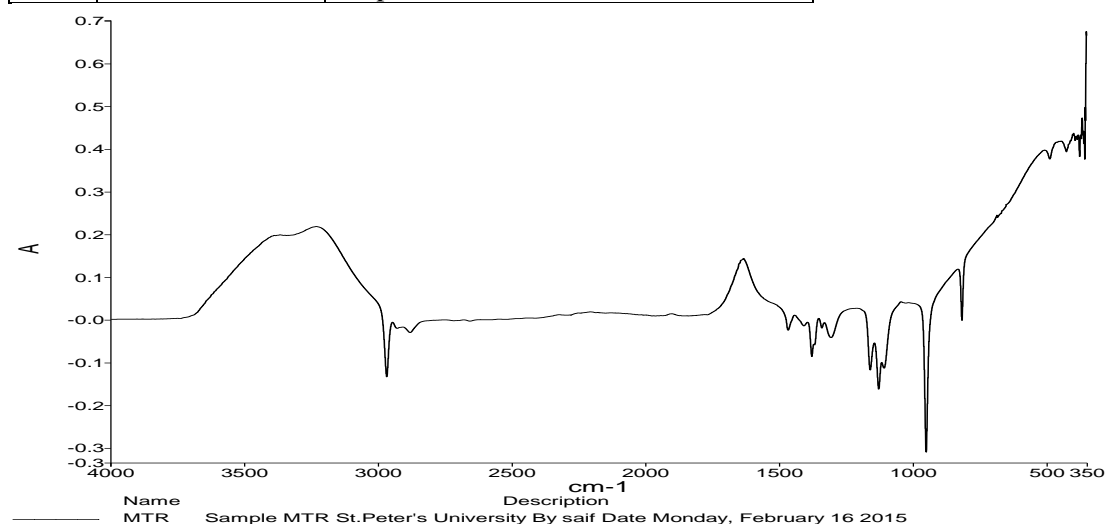


Figure1- FTIR spectrum of Methanol extract of *Merremia Tridentata*

Table2:Phytochemicals identified in methanolic root extract of *Merremia tridentata* L.using GC-MS

S. No	RT	Name of compound	Molecular formula	MW	Peak area%	Nature of compound	Biological activity
1	14.22	Do decanoic acid	C ₁₂ H ₂₄ O ₂	200	0.73	Lauric acid	Antibacterial, Antiviral, Antioxidant, Hypocholesterolemic, Candidicide
2	20.93	Nonanoic acid Methyl ester(CAS)	C ₁₀ H ₂₀ O ₂	172	6.58	Ienolenic acid	Anticancer

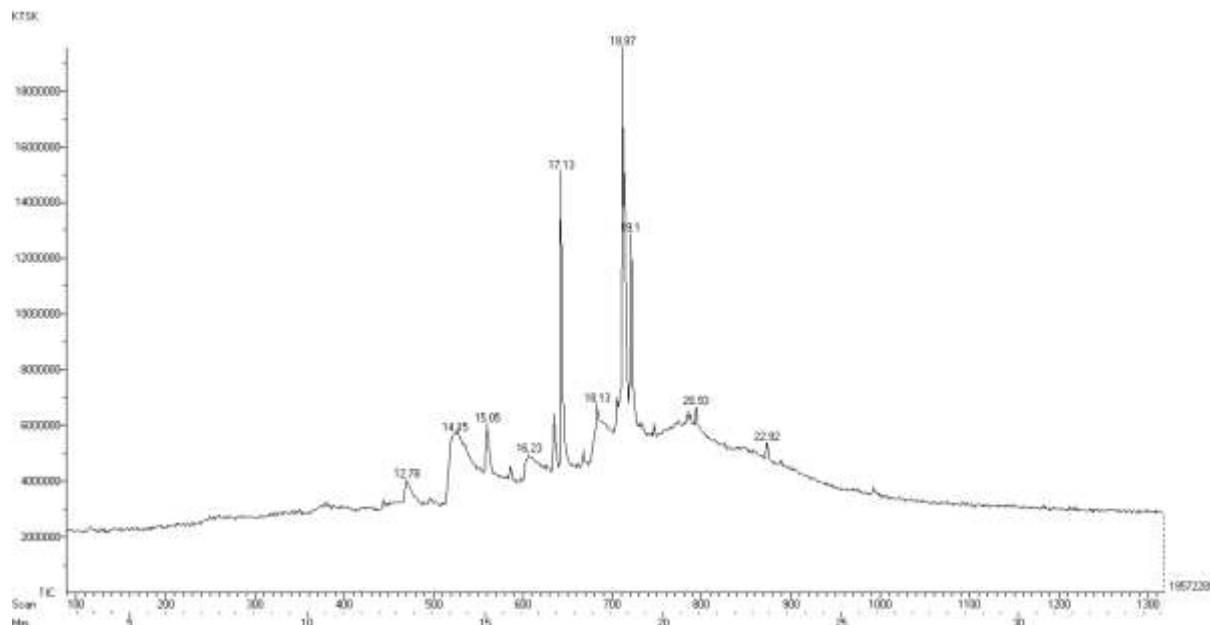


Figure2- GC-MS spectrum of Methanol extract of Merremia Tridentata

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