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GC–MS analysis of biologically active compounds in *Canthium parviflorum* Lam. leaf and callus extracts

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Abstract : *Canthium parviflorum* is an important medicinal plant widely used in traditional systems of medicine. In the present work, we reported the FTIR and GC-MS analysis by using in vitro grown callus on MS medium supplemented with BA (0.1 to 0.5 mg/l) and NAA (0.5 and 1.0 mg/l) used with leaf explants compared with wild leaf explants. After 2 to 3 subcultures callus was collected and dried at normal temperature. To explore the phyto profile of callus extracts of *Canthium parviflorum,* fluorescence UV-Vis and FT-IR were analysed and GC-MS analysis revealed more phytocompounds comparatively with wild plants. The compounds were identified by comparing their retention time and peak area with that of literature and by interpretation of mass spectra. More than sixty compounds were extracted from the callus extracts. The presence of phyto-components reveals the importance of the plant as medicinally used. So, it is recommended as a plant of phyto - pharmaceutical importance.

Keywords : *Canthium parviflorum,* FT-IR, GC-MS analysis, phytocompounds, callus extracts, in vitro, pharmacological importance.

Introduction

Medicinal plants have been used as traditional treatments for numerous human diseases for thousands of years and in many parts of the world. The natural products derived from medicinal plants have proven to be an abundant source of biologically active compounds many of which have been the basis for the development of new lead chemicals for pharmaceuticals.[1]The pharmaceutical companies shows that for some complex diseases, natural products still represent an extremely valuable source for the production of new chemical entities.[2]Phyto pharmacological screening of medicinal plants and their extracts will reveal the presence of valuable compounds and provide insight into new ways of treatment with new drugs. The accumulation of phyto chemicals in the plant cell cultures has been studied for more than thirty years, and the generated knowledge has helped in the realization of using cell cultures for production of desired phyto chemicals.[3] Although very few plant cell processes are operating commercially, the most successful commercial pharmaceuticals produced from undifferentiated cell cultures are anti-biotic compounds. So, cell suspension culturing is considered one of the best approaches for studying the biosynthesis of natural products, and calli are the richest sources of cell mass when establishing such cultures.[4]

Canthium parviflorum Lam. (syn: *Plectoria parviflora*) of Rubiaceae is commonly called as Balusu in Telugu. The leaves and roots are astringent, sweet, thermogenic, constipating and tonic. They are astringent and effective against cough and indigestion.[5] Leaves and roots of this plant are used as astringent, diuretic, febrifuge, anthelmintic, anti diarrhoea and for leucorrhoea[6]and its used for the treatment of diabetes among

major tribal groups in South Tamilnadu.[7] Tribes of Orissa state in India use fruits of this plant to treat headache. Traditionally the roots and leaves are used to cure vitiated conditions of Kapha in fever and constipation.[8]

Material & methods

Callus culture.

Fresh, young leaf material was collected and washed thoroughly under running tap water to remove dust particles. Leaf explants was excised aseptically and cultured on MS (Murashige & Skoog)[9]medium(1962) supplemented with BA (Benzyl adenine) (0.2 mg/l) and NAA (Naphthalene acetic acid) (0.5 and1.0 mg/l).

Extraction from Callus Cultures

6 - 8 week-old callus derived from the leaf cuttings were collected and 25g of wild leaf explants taken after dried in an oven at 40 ± 1º c for 5 hours. 25g of leaf callus powder were extracted with 150 ml of solvent ethyl acetate and methanol for 24 h by using Soxhlet apparatus. 100 mg / ml were prepared by redissolving the extracted powder in the same solvent which was used in the extraction. This callus extracts was used for FTIR and GC-MS analysis.

Spectroscopic analysis

For UV-Vis and FT-IR spectrophotometer analysis, the crude extracts and wild plant leaf 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 to 1:10 with the same solvent. The extracts were scanned in the wavelength ranging from 1100-3000 nm using Perkin Elmer Spectrophotometer and the characteristic peaks were detected. FT-IR analysis was performed using Perkin Elmer Spectrophotometer system, which was used to detect the characteristic peaks and their functional groups. The peak values of the UV-Vis and FT-IR were recorded. Each and every analysis was repeated twice for the spectrum confirmation.

Procedure

The GC-MS analyses were carried out in a GC Model: 7890A GC System, MS: 5975C Inert MSD with Triple Axis Detector. Gas chromatograph fitted with a DB1 (methylphenylsiloxane, 30 m × 0.25 mm i.d.) capillary column. The MS operating parameters were as follows: ionization potential 70 eV; ion source temperature 200°C; quadrupole 100°C, solvent delay 6.0 min , scan speed 2000 amu/s, total MS running time 35min. and Mass Scan Range: 30 to 600m/z, eV voltage 3000 volts. The concentrated extract is injected into the GC/MS instrument (HP-5MS 30m*0.25um*0.25 Agilent Technologies Part No: 19091S-433).

The sample is volatilized at the injection port and eluted through a capillary column under increasing temperature. As the sample moves through the column, various components are separated due to their affinity for the stationary phase of the column and can be identified by retention time. Each chemical component in a sample has a distinct retention time measured in minutes, shown in a peak on a graph. The integrated peak is correlated to the concentration of the chemical. A mass selective detector breaks up each chromatographic component into fragment ions, which are shown by their abundance, with each ion represented as a vertical line in increasing molecular weight. The height of each line corresponds to the abundance of that ion. The resulting mass spectrum is unique to that chemical. This mass spectrum forms a ‘‘fingerprint’’ that can identify the compound by a computer search of mass spectra. A computer search of the mass spectra corresponding to all the chromatographic peaks for a sample should yield a statistical match for nicotine at a 12·9 min retention time value. First, there is a ‘‘Scan’’ mode which looks at all the constituents of a sample, listing whatever chemical components are present

Compound Identification

Components of the ethyl acetate, methanol extracts were identified by comparison of their mass spectra and retention indices with those published in the literature and contained in The National Institute of Standard and Technology (NIST) library database. Library Version: 2.0 MS computer library.

Results

The FTIR (Fourier Transform Infrared Spectrometer) was performed from the plant callus extract of *Canthium parviflorum* to analyse the functional group. In *Canthium parviflorum* extract IR spectrum shows strong absorption peaks at 1651.07 cm-1, 1112.93 cm-1, 1735.93cm-1, 2040.69cm-1, 2216.21cm-1, 2524.82 cm-1, 2835.36 cm-1, 2947 cm-1, 3302 cm-1 which corresponds to alkene (C=C) and ether (C-O) groups (Table. 1 and Fig. 1).

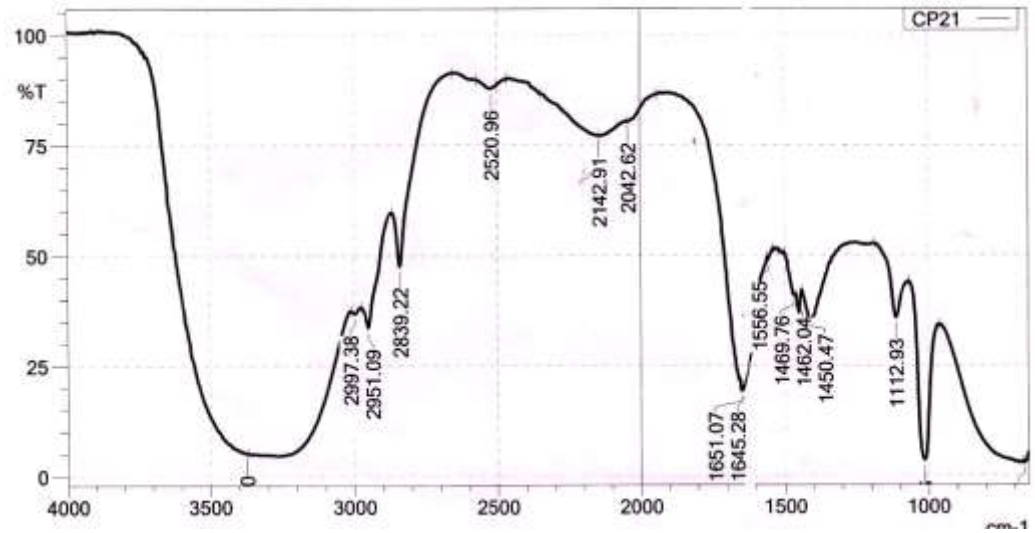


Fig 1 FTIR spectrum of callus extracts *Canthium parviflorum*.

Table 1: FT-IR peak values with functional groups in callus extract of *Canthium parviflorum.*

Peak	**Functional Group**
1112.93	Aliphatic amines (C-N Stretch) Alcohols, carboxylic acid, esters, ethers (C-O Stretch)
1450.47	Aromatics (C-C Stretch (in-ring)
1556.55	Primary amines
1645.28	Alkenes(-C=C-Stretch), Aldehydes, saturated aliphatic (C=O Stretch)
2042.62	Alkanes (C-H Stretch); Alkanes (terminal) (-(triple bond) (C-H:C-H stretch)
2520.96	Primary, secondary amines, amides (N-H Stretch)
2839.22	Alkanes (C-H Stretch); Alkanes (terminal)(-(triple bond) (C-H:C-H stretch); Primary, secondary amines, amides
2951.09	Alkanes (C-H Stretch)

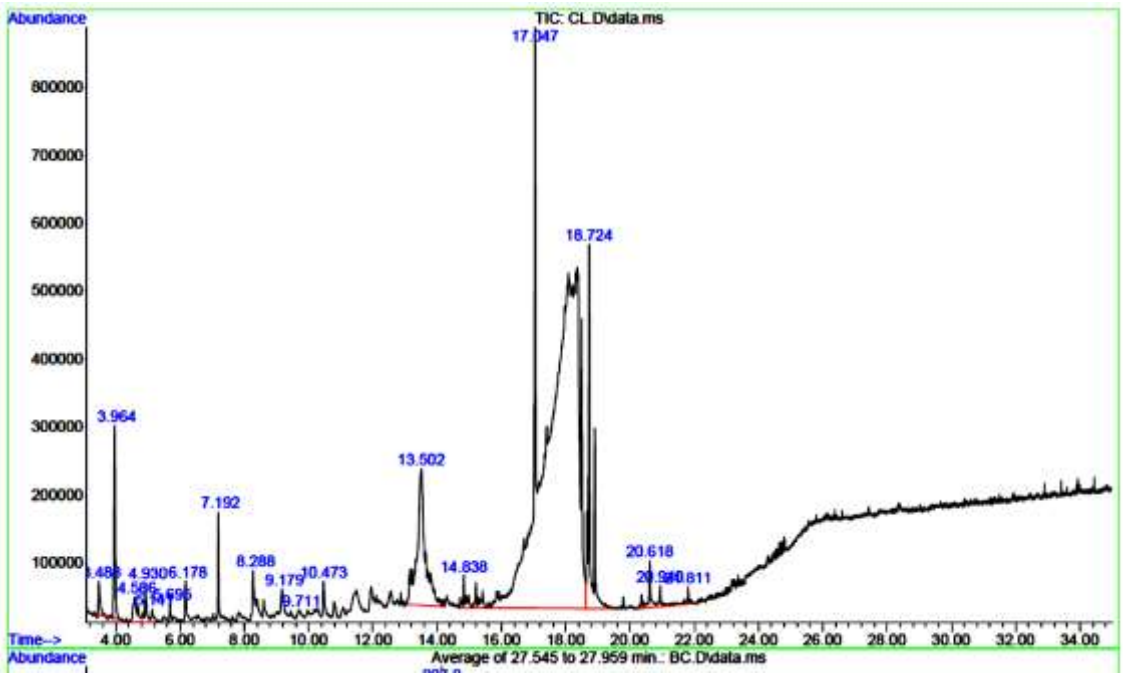
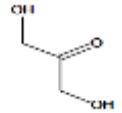
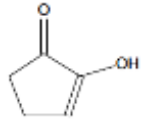
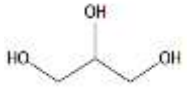
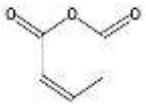
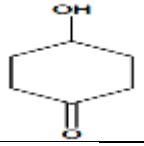
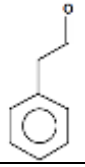
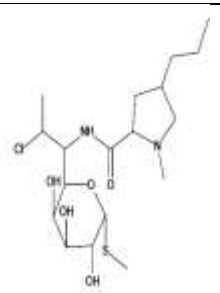
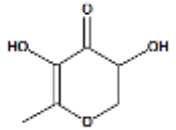
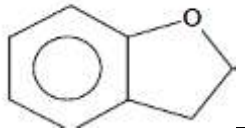
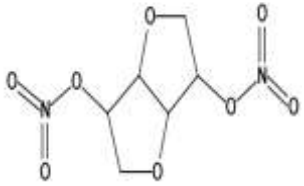
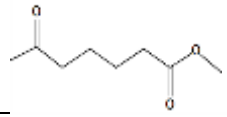
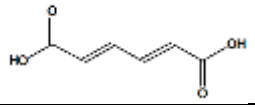
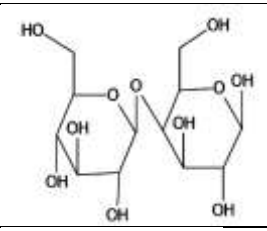
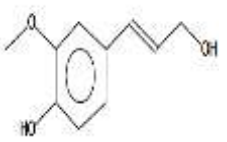
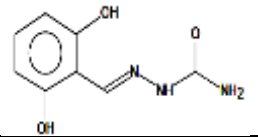
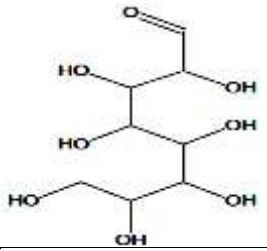
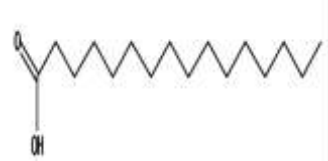
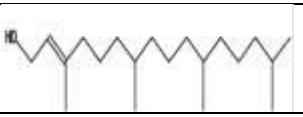


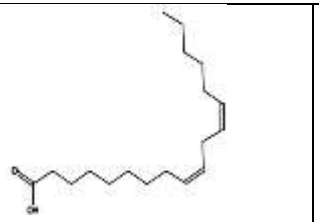
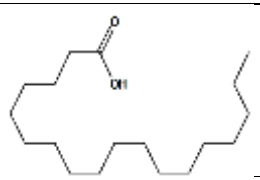
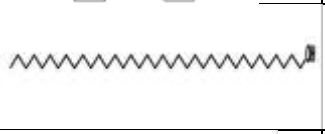
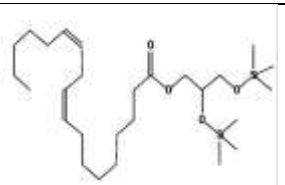
Fig 2 GC MS analysis of leaf methanol extract of *Canthium parviflorum*

Table: 2GC MS analysis of leaf methanol extract of *Canthium parviflorum*

No.	RT	Name of the compound	Molecular formula	Molecular Weight	Peak area %	Structure	Biological activity
1.		2-Propanone, 1,3-dihydroxy	C3H6O3	**90**			cholinesterase inhibitor drugs
2.		2-Cyclopenten-1-one, 2-hydroxy-	C5H6O2	**98**			Antimicrobial, Anti-inflammatory, Anticancer, Dieruretic
3.		Glycerin	C3H8O3	**92**			cough syrups, elixirs and expectorants, toothpaste, mouthwashes, skin care products,
4.		2H-Pyran-2,6(3H)-dione	C5H4O3	**112**			Antiallergic activity
5.		Cyclohexanone, 4-hydroxy-	C6H10O2	**114**			antioxidant capacities
6.		Benzeneacetaldehyde	C8H8O	**120**			Antimicrobial

7.		Clindamycin	C18H33ClN2O5S	**424**			antibacterial
8.		4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl-	C6H8O4	**144**			antioxidant
9.		Benzofuran, 2,3-dihydro	C8H8O	**120**			Neuroinflammation
10.		IsosorbideDinitrate	C6H8N2O8	**236**			chest pain, headaches
11.		Methyl 6-oxoheptanoate	C8H14O3	**158**			Anti canceer
12.		2,4-Hexadienedioic acid	C6H6O4	**142**			preservatives in food and drinks to prevent the growth of mold, yeast, and fungi

13.		β-D-Glucopyranose, 4-O-β-D-galactopyranosyl	C12H22O11	**342**			sweeten food, beverages, medications, arthritis.[6]
14.		4-((1E)-3-Hydroxy-1-propenyl)-2-methoxyphenol	C10H12O3	**180**			Antioxidant, Antimicrobial Anti inflammatory
15.		2,6-Dihydroxybenzaldehyde, carbamoylhydrazone	C8H9N3O3	**195**			lipid peroxidation
16.		l-Gala-l-ido-octose	C8H16O8	**240**			**Used for memory Drugs production**
17.		n-Hexadecanoic acid	C16H32O2	**256**			Antioxidant, Hypochloesterolemic, Nematicide, Pesticide, Lubricant, Antiandrogenic, Hemolytic,5-Alpha reductase inhibitor
18.		Phytol	C20H40O	**296**			Anticancer, antioxidant, antiinflammatory and diuretic

19.		9,12-Octadecadienoic acid (Z,Z)-	C18H32O 2	**280**			Anti-inflammatory, Hypercholesterolemic, Cancer preventive, Hepatoprotective, Nematicide, Insectifuge, Antihistamine, Anti-eczemic, Anti-acne, 5-Alpha reductase inhibitor, Antiandrogenic, Anti-arthritic, Anti-coronary
20.		Octadecanoic acid	C18H36O 2	**284**			Antimicrobial and anti-inflammatory, hepatoprotective, hypercholesterolemic, anticancer
21.		1-Heptatriacotanol	C37H76O	**536**			anticancer, antineoplastic and anti-HIV
22.		1-Monolinoleoylglycerol trimethylsilyl ether	C27H54O 4Si2	**498**			Antimicrobial Antioxidant Antiinflammatory Antiarthritic Antiasthma, Diuretic

The most prevailing compounds from *Canthiumparviflorum* leaf were listed methanolic extracts 2-Propanone, 1,3-dihydroxy, 2-Cyclopenten-1-one, 2-hydroxy-, Glycerin, 2H-Pyran-2,6(3H)-dione, Cyclohexanone, 4-hydroxy-, Benzene acetaldehyde, Clindamycin, 4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl-, Benzofuran, 2,3-dihydro, IsosorbideDinitrate, Methyl 6-oxoheptanoate, 2,4-Hexadienedioic acid, β-D-Glucopyranose, 4-O-β-D-galactopyranosyl, Phytol, Octadecanoic acid, 4-((1E)-3-Hydroxy-1-propenyl)-2-methoxyphenol,2,6-Dihydroxybenzaldehyde, n-Hexadecanoic acid, Carbamoylhydrazone, l-Gala-l-ido-octose, 9,12-Octadecadienoic acid (Z,Z)-, 9,12,15-Octadecatrienoic acid, (Z,Z,Z)-, 1-Heptatriacotanol, 1-Monolinoleoylglycerol trimethylsilyl ether.The GC-MS chromatogram shows the peak area separation.

Based on the previous reports Biphenyl, 2-Methyl-4-heptanone, 1,2,4,5-Tetroxane,3,3,6.6-Tetraphenyl-, 3-Oxo-Alapha,-Ionol, Methyl 7-hydroxy-2-methyl-3,5-octadienoate, 4-(2-Hydroxy-2,6,6-Trimethylcyclohexyl)-3-buten-2-one, n-Hexadecanoic acid, E-11- Hexadecanoic acid,Ethylester, EthylHexadecanoate, Phytol, Ethyl(9Z,12Z)-9,12- Octadecanoate, Ethyl Linolenate, 1-Hexadecanol, 2-Phenoxyl-2-phenylpropanic acid, All-trans-squalene, Methyl Linolenate, Gamma-Tocopherol, DEPH;1,2-Benzenedicarboxylicacid,bis (2-hylhexyl)ester, Stigmasterol, Gamma-stigmasterol, Methyl cis-11,14,17-Icosatrienoate.[10]

Based on the previous reports on the *Canthium coromandelicum* leaf extract revealed Thirteen phytocompounds by GC-MS analysis. The components are 1,6,10-odecatriene,7,11-dimethyl -3-methylene-,(E), 3,7,11`,15-Tetramethyl-2-Hexadecan-1-ol, 2-Tridecen-1-ol, E-2-Tetradecen-1-ol, Phytol, 2-Amininonadecane, Octadecane,6-methyl-, Didodecyl phthalate, 1-Nonodecanol, Valeric acid, 2-Pentadecyl ester, Squalence, Z-8-Methyl-9-tetradecenoic acid, Heptadecanoic acid.[11]*Canthiumparviflorum* leaf with methanol extracts presence of the phytol compound exhibits more biological properties like Antimicrobial, Anticancer, Cancer preventive, Diuretic Antimicrobial, Anticancer, Cancer preventive, Diuretic, Anti-inflammatory.[9]In our results we observed thephytol compound present in all areas of *Canthium parviflorum* plants including Guntur district plants also, comparatively with Tamilnadu and Chennai are plants revealed the compounds also phytoln-Hexadecanoic acid.[10,11]Octadecanoic acid possesses antiinflammatory, hepatoprotective, hypercholesterolemic, anticancer and many other properties[12,13]and Antimicrobial activity of hexadecanoicacid was discussed byBergsson.[14]The l-gala idooctose used for the production of Drugs used to specifically facilitate learning or memory, particularly to prevent the cognitive deficits associated with dementias.[15]In the presence of the compound is 6- dihydroxybenzaldehyde used in the lipid peroxidation. [16]So comparatively with these results more compounds revealed the Guntur district area plants of *Canthium parviflorum* than the Tamilnadu area plants.

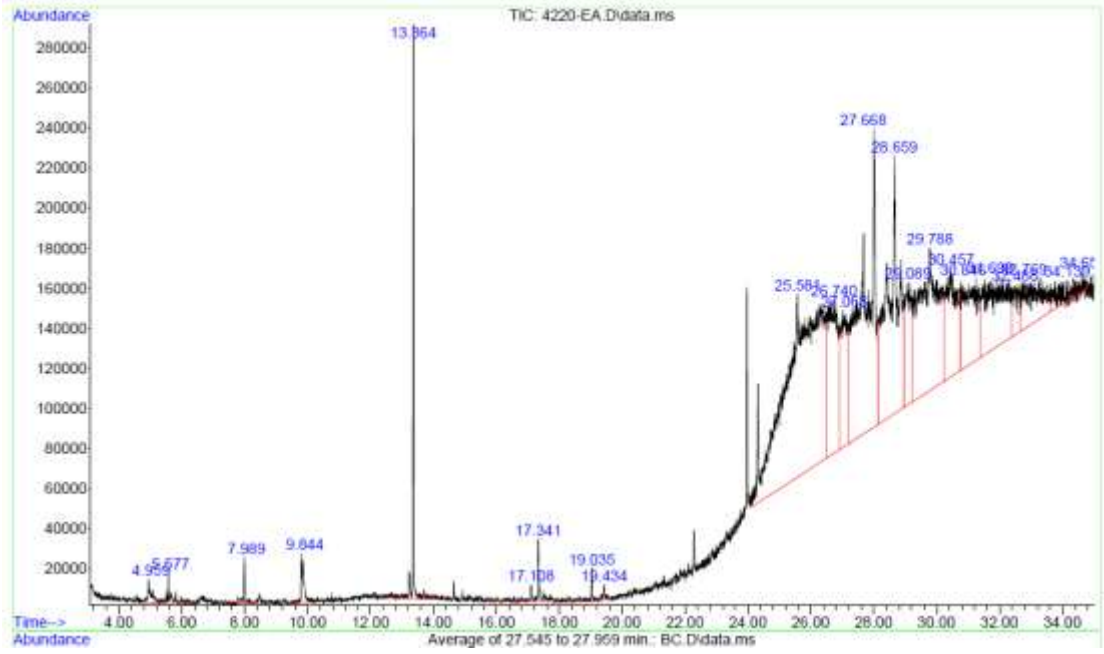
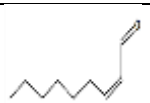
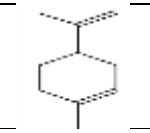
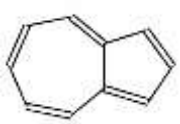
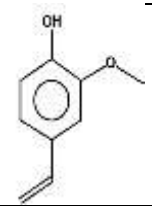
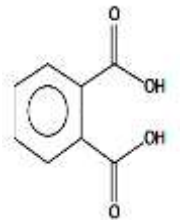
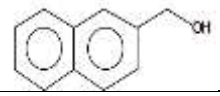
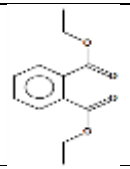
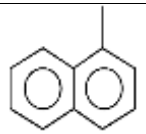
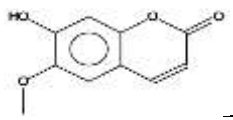
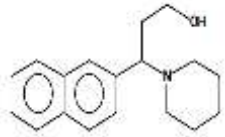
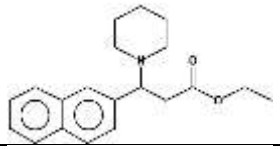
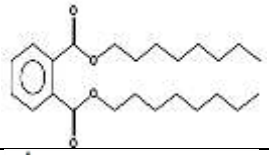
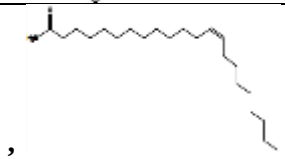
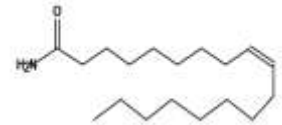
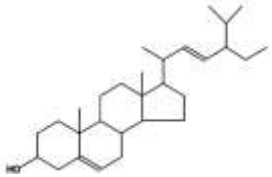


Fig 4 GC MS analysis of callus extract with ethyl acetate of *Canthium parviflorum*

Table: 3 GC MS analysis of callus extract with ethyl acetate of *Canthium parviflorum*

No.	RT	Name of the compound	Molecular formula	Molecular Weight	Peak area %	Structure	Biological activity
1.	**3.76**	**2-Nonenol**	**C9H6O**	**140**	**10.18**		Lipid periodixidation
2.	**4.12**	**Cyclohexane**	**C10H16**	**136**	**15.82**		Antimicrobial agents
3.	**7.36**	**Azulene**	**C10H8**	**128**	**14.44**		Antiulcer Antimicrobial Antiallergic Antiinflammatory, Antipyretic Antiseptic Anticancer
4.	**9.43**	**2-Methoxy-4-vinylphenol**	**C9H10O2**	**128**	**2.295**		Antioxidant Antimicrobial Anti-inflammatory
5.	**13.70**	**1,2-Benzenedicarboxylic acid**	**C8H6O4**	**166**	**13.90**		Used as Softeners, perfumes and cosmetics, plasticized vinyl seats on furniture and in cars, and clothing including jackets, raincoats and boots. Used in textiles, as dyestuffs, cosmetics and glass making
6.	**15.93**	**2-Naphathalenemethanol**	**C11H10O**	**158**	**13.39**		anti-micro- organism

7.	**13.35**	**Diethyl pthalate**	**C12H14O4**	**222**	**13.39**		Antimicrobial Antifouling
8.	**13.41**	**Dodecanol**	**C12H24O**	**184**	**4.80**		Antioxidant
9.	**19.04**	**Naphathalene, 1-methyl**	**C11H10**	**142**	**1.86**		Anti-tumor, analgesic antibacterial, anti-inflammatory sedative, fungicide
10.	**18.34**	**7-Hydroxy-6methoxy-2H-1-benzopyran-2-one**	**C10H8O4**	**192**	**1.42**		Antimicrobial
11.	**16.22**	**3-Naphathalene-2yl-3-piperidin-1yl-propan-1-o1**	**C18H23NO**	**269**	**1.22**		anti- insect, anti- microbial
12.	**23.96**	**1-Piperidinepropanoic acid**	**C22H29NO2**	**339**	**1.86**		Urinary track infections, Antiviral, antidepressant, cytotoxic and antimalarial activity.
13.	**20.28**	**Di-n-octyl phthalate**	**C24H38O4**	**390**	**1.26**		Antivenom
14.	**18.22**	**13-Docosenamide**	**C22H43NO**	**337**	**1.44**	 ,	antimicrobial, antioxidant and antiinflammatory properties

15.	**16.24**	**9-Octacenamide**	**C18H35NO**	**281**	**1.68**		Anti-inflammatory activity, antibacterial activity, and anti-cancer properties
16.	**18.66**	**Stigmasterol**	**C29H48O**	**412**	**1.22**		Antioxidant, hypoglycemic and thyroid inhibiting properties, precursor of progesterone, antimicrobial, anticancer,antiarthritic, antiasthama, anti inflammatory, diuretic

The most prevailing major compounds were revealed from *Canthium parviflorum* callus with ethyl acetate extracts 2-Nonenol, Cyclohexane, Azulene, 2-Methoxy-4-vinylphenol, 1,2-Benzenedicarboxylic acid, 2-Naphathalenemethanol, Diethyl phthalate, 2-Decen-1-o1, Naphathalene, 1-methy, 7-Hydroxy-6methoxy-2H-1-benzopyran-2-one, 3-Naphathalene-2yl-3-piperidin-1yl-propan-1-o1, 1-Piperidinepropanoic acid, Di-n-octyl phthalate, 13-Docosenamide, 9-Octacenamide, Stigmasterol.

Prabhu *et al.*, 2013 reported the Cyclohexane,1,2-Benzenedicarboxylic acid, Stigmasterolphyto compounds are present in the ethyl acetate leaf extract of *Canthium parviflorum*, thesec ompounds matched with our ethylacetate leaf callus extract results.In the presence of the callus extracts Stigmasterol, it has been reported to induce apoptosis in Ehrlich's ascites carcinoma in mice through the activation of protein phosphatise 2A via ceramide.[17]Most of these compounds have been associated with several biological or pharmaceutical properties; it's responsible for medicinal potential of the plants.

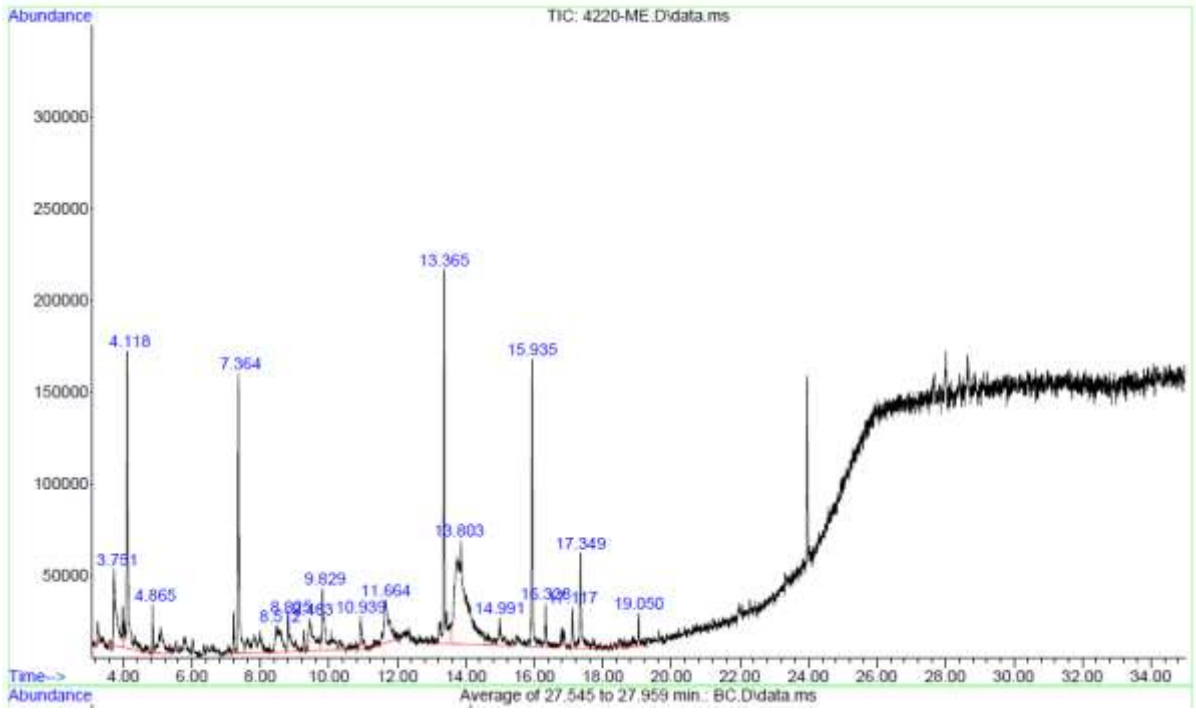
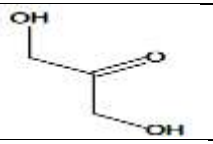
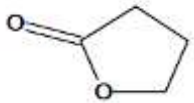
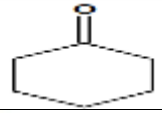
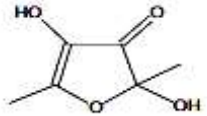
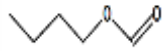
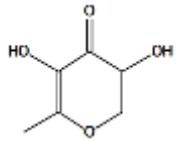
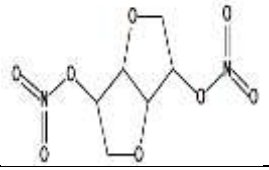
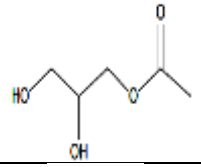
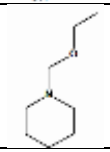
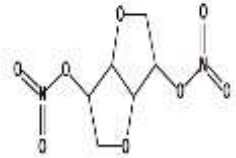
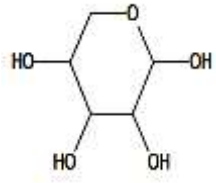
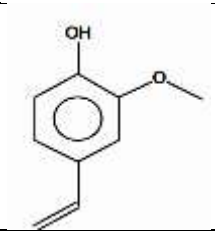


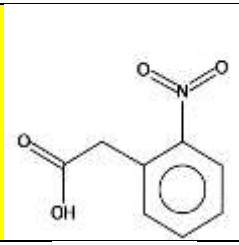
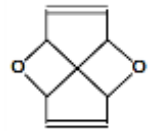
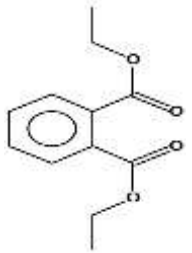
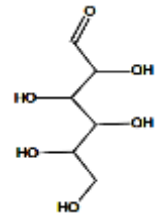
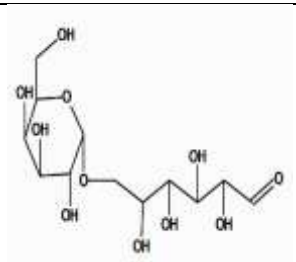
Fig 6 GC MS analysis of callus extract with methanol of *Canthium parviflorum*

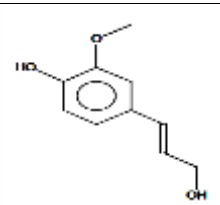
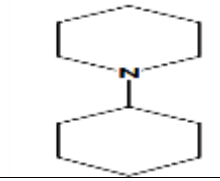
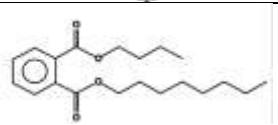
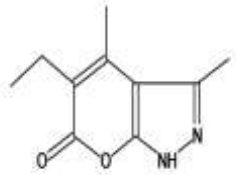
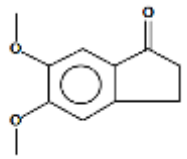
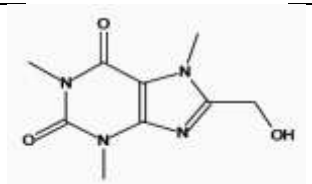
The most prevailing major compounds were revealed from callus with methanol extracts 2-Propanone, 1,3-dihydroxy, 1,2-Ethanediol, 3-Buten-1-ol, Butyrolactone, 2-Cyclopenten-1-one, 2-hydroxy-, Cyclohexanone, 2,4-Dihydroxy-2,5-dimethyl-3(2H)-furan-3-one, 1,3-Dioxane, 2,4-dimethyl-, Urea, N-butyl-N-nitroso-, Formic acid, butyl ester, 4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl-, Isosorbide Dinitrate, 1,2,3-Propanetriol, monoacetate, Piperidine, 1-(ethoxymethyl, 1-(5-Hydroxypentyl) piperidine, Isosorbide Dinitrate, DL-Arabinose, 2-Methoxy-4-vinylphenol, 4-Hydroxy-2-methylacetophenone, Undecanoic acid, 11-amino-, 1-Ethyl-1-propoxy-1-silacyclopentane, Benzeneacetic acid, 2-nitro-, 2,7-Dioxa-tricyclo[4.4.0.0(3,8)]deca-4,9-diene, Diethyl Phthalate, d-Mannose, 5-(1-Hydroxy-1-methyl-ethyl)-3-(4-methoxy-phenyl)-isoxazolidin-5-ol, α-D-Glucopyranoside, O-α-D-glucopyranosyl-(1.fwdarw.3)-β-D-fructofuranosyl,D-Glucose, 6-O-α-D-galactopyranosyl-, Phenol, 4-(3-hydroxy-1-propenyl)-2-methoxy-, 4-((1E)-3-Hydroxy-1-propenyl)-2-methoxyphenol, Acetamide, N-(4-ethoxy-3-hydroxyphenyl)-, Piperidine, 1-cyclohexyl-, 1,2-Benzene dicarboxylic acid, butyl octyl ester, 1-Naphthaleneacetamide, Naphthalene, 1-methyl-, 5-Ethyl-3,4-dimethyl-1H-pyrano[2,3-c]pyrazol-6-one, 5,6-Dimethoxy-1-indanone, Naphthalene, 1H-Purine-2,6-dione, 3,7-dihydro-8-(hydroxymethyl)-1,3,7-trimethyl-, 3-Naphthalen-2-yl-3-piperidin-1-yl-propan-1-ol, 13-Docosenamide, (Z)-.

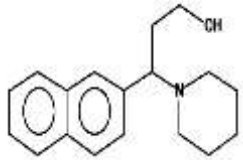
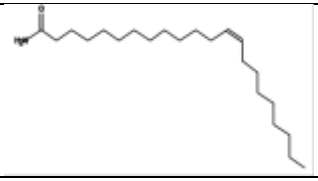
Table: 4 GC MS analysis of callus extract with methanol of *Canthium parviflorum*

No.	RT	Name of the compound	Molecular formula	Molecular Weight	Peak area %	Structure	Biological activity
1.	**3.766**	**2-Propanone, 1,3-dihydroxy-**	**C3H6O3**	**90**	**1.85**		It is used to make plastic, fibers, drugs, and other chemicals.
2.	**7.362**	**Butyrolactone**	**C4H6O2**	**86**	**2.92**		antioxidant and analgesic activities
3.	**4.282**	**Cyclohexanone**	**C6H10O**	**98**	**4.24**		Anti-microbial agents
4.	**7.362**	**2,4-Dihydroxy-2,5-dimethyl-3(2H)-furan-3-one**	**C6H8O4**	**144**	**1.48**		flavor compounds in many fruit
5.	**4.622**	**Formic acid, butyl ester**	**C5H10O2**	**102**	**3.22**		antibacterial agent
6.	**4.282**	**4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl-**	**C6H8O4**	**144**	**5.34**		antibacterial activity
7.	**5.262**	**IsosorbideDinitrate**	**C6H8N2O8**	**236**	**5.22**		therapy of heart failure

8.	**2.264**	**1,2,3-Propanetriol, monoacetate**	**C5H10O4**	**134**	**4.48**		**Anti fungal**
9.	**3.766**	**Piperidine, 1-(ethoxymethyl)-**	**C8H17NO**	**143**	**5.45**		anticoagulant activity
10.	**3.766**	**IsosorbideDinitrate**	**C6H8N2O8**	**236**	**2.662**		decrease of blood pressure, angina pectoris
11.	**8.726**	**DL-Arabinose**	**C5H10O5**	**150**	**2.46**		**Antitumor**
12.	**4.762**	**2-Methoxy-4-vinylphenol**	**C9H10O2**	**150**	**6.82**		Antioxidant Antimicrobial Anti-inflammatory, Anticancer,
13.	**4.882**	**Undecanoic acid, 11-amino-**	**C11H23NO 2**	**201**	**2.428**		**No activity reported**

14.	**4.624**	**Benzeneacetic acid, 2-nitro-**	**C8H7NO4**	**181**	**4.62**		No activity reported
15.	**8.811**	**2,7-Dioxa-tricyclo[4.4.0.0(3,8)] deca-4,9-diene**	**C8H8O2**	**136**	**3.69**		color cosmetic composition
16.	**13.359**	**Diethyl Phthalate**	**C12H14O4**	**222**	**13.90**		Antimicrobial Antifouling
17.	**19.045**	**d-Mannose**	**C6H12O6**	**180**	**1.86**		Sugar moiety and Presevative
18.	**3.766**	**D-Glucose, 6-O-α-D-galactopyranosyl-**	**C12H22O11**	**342**	**2.29**		Sugar moiety and Presevative

19.	**19.045**	**Phenol, 4-(3-hydroxy-1-propenyl)-2-methoxy-**	**C10H12O3**	**180**	**1.86**		antimicrobial activity antiviral, anti-inflammatory, cytotoxic activity, antimutagenic and anticarcinogenic activities, Antioxidant .
20.	**4.220**	**Piperidine, 1-cyclohexyl-**	**C11H21N**	**167**	**1.86**		allergic or inflammatory disorders such as asthma
21.	**4..288**	**1,2-Benzenedicarboxylic acid, butyloctyl ester**	**C20H30O4**	**334**	**4.24**		antimicrobial cytotoxicity antioxidant
22.	**6.224**	**Naphthalene, 1-methyl-**	**C11H10**	**142**	**4.60**		fungicidal, antimicrobial
23.	**3.7661**	**5,6-Dimethoxy-1-indanone**	**C11H12O3**	**192**	**2.24**		Antioxidative
24.	**18.22**	**1H-Purine-2,6-dione, 3,7-dihydro-8-(hydroxymethyl)-1,3,7-trimethyl-**	**C9H12N4O3**	**224**	**4.62**		antitubercular, fungicidal, antiallergic, antimicrobial, antitumor, antihistamic

25.	**20.34**	**3-Naphthalen-2-yl-3-piperidin-1-yl-propan-1-ol**	**C18H23NO**	**269**	**6.99**		fungicidal, antimicrobial
26.	**23.967**	**13-Docosenamide, (Z)-**	**C22H43NO**	**337**	**7.69**		antimicrobial, antioxidant and antiinflammatory properties

1,2-Benzenedicarboxylic acid Used as Softeners, Used in preparation of perfumes and cosmetics.[18] Naphthalene is well known for its antimicrobial activity.[19,20]The phenolic compounds are known to be synthesized by plants in response to microbial infection. It is thereforepossible that they can act as effective antimicrobial substances against a wide array of microorganisms.Among the identified compounds phenol, 4H-pyran-4-one, 1,2-benzene dicarboxylic acid, octadecanoic acid have the antibacterial activity asreported by earlier workers. [21]

Discussion

In recent years, the interest for the study of the organic compounds from plant callus extracts and their activity has increased. The combination of an ideal separation technique (GC) with the best identification technique (MS) made GC–MS an ideal technique for qualitative and quantitative analysis for volatile and semi-volatile compounds. The aim of the present study was to develop a rapid method for the quantitative determination of organic compounds in plant callus extracts and to confirm the phytochemical present in the wild plant extracts and co relation of the presence of compounds and to know the differentiation.

Canthium parviflorum ethyl acetate callus extracts are contained 1,2-Benzenedicarboxylic acid and its used in synthesis of dyes and perfumes; neurodegenerative disorders. The result of the present investigation reveals that the methanolic extracts of *Canthium parviflorum* possessed significant anticancer activity which was analyzed by GC-MS analysis. Different phytochemicals have been found to have a broad range of activities, which may help in protection against chronic diseases.

Conclusion

Canthium parviflorum callus extracts are contained various phytochemicals with biological activity can be of valuable therapeutic key. The GC-MS analysis of the ethyl acetate and methanolcallus extract of *Canthium parviflorum* reveals the presence of phytoconstituents. The presence of such a variety of phytochemicals may be attributed to the medicinal characteristics of this plant C*anthium parviflorum* callus extract. The presence of phyto-components reveals the importance of the plant as medicinally used. Further investigations are planned to conduct the pharmacological studies to know the potency of theseextracts. So, it is recommended as a plant of phyto - pharmaceutical importance.

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