



Research Article

**GC-MS ANALYSIS OF METHANOL EXTRACT OF LEAF OF WATTAKAKA VOLUBILIS
(L.F)**

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Abstract: The investigation was carried out to determine the possible bioactive compounds of Wattakaka volubilis leaf using GC-MS analysis. The chemical compositions of the methanol extract of Wattakaka volubilis leaf was investigated using Perkin-Elmer Gas chromatography- Mass Spectrometry, while the mass –spectra of the compounds found in the extract was matched with the National Institute of standard and Technology (NIST) library. Twenty compounds were identified, Dodecanoic Acid (11.32%) . Was found to be the major component followed by 9- Octadecenoic acid(Z) -9 Octadecenyl ester, (Z) (11.09%), 9-Octadecenoic acid,(Z) and Elaidinsaeure(7.87%). Hexadecanoic acid (5.06%). Pentacyclic acid (4.26%) , were found as the major compound in methanol extract of Wattakaka volubilis (L.F) Stapf leaf . Very small quantity(1.16%) of 3-pentanol 1,3-Dioxolane, 4-methyl- 2- pentadecyl were reported..

Keywords: GC-MS, Wattakaka volubilis, Essential compounds, Dodecanoic Acid, Cytotoxicity activity.

INTRODUCTION:

In recent years the use of herbs in the treatment of diseases has gained considerable importance, and there are the main sources of biologically active compounds . The plants Wattakaka volubilis (Asclepiadaceae) is a fleshy, large climber with green flowers in drooping umbels and found throughout the plains. This plant is used in the treatment of various ailments since ancient times [1]. The literature survey revealed that among the various saponins obtained from the stem and flower of this plant, two compounds are active against Enrich' ascites carcinoma [2,3]. Wattakaka volubilis is used for treating anti inflammatory analgesic and anti –lipid peroxidative [4]. The present study was aimed to identify the GC-MS analysis of methanol extract of Wattakaka volubilis leaf.

MATERIALS AND METHODS:

Collection of plant material:

The *Wattakaka volubilis* was collected from Tiruchirappalli, Tamilnadu, India and the plant was identified and voucher specimen was deposited in the Rapinet Herbarium , St.Joseph's college, Tiruchirappalli.

Preparation of extract

The plant leaves were air dried and crushed to small piece using mortar and pestle and powdered in an electric grinder .Dried and powdered plant material is extracted using soxhlet apparatus with methanol ,ethanol solvent (50-60c) for 72 hrs . The extract was collected and evaporated to dryness by using a vacuum distillation unit. The final residue thus obtained was then subjected to GC-MS analysis.

Gas chromatography-mass spectrum analysis (GC-MS)

GC-MS analysis was carried out on a GC clarus 500 perlin elmer system comprising a AOC-20i autosampler and gas chromatograph interfaced to a mass spectrophotometer (GC – MS) instrument employing the following conditions :column elite-1 fused silica capillary column (30x0.25 mm IDx1 EM df, composed of 100% dimethyl polysiloxane), operating in electron impact mode at 70 Ev; helium (99-999%) was used as carrier gas at a constant flow of 1 ml/min and an injection volume of 0.5 EI was employed (split ratio of 10:1 injector temperature 250 ° C .The oven temperature was programmed from 110° C (iso thermal for 2 min)with an increase of 10 C / min , to 200 ° C then 5 ° C / min 280 ° C , ending with a 9 min isothermal at 280 ° C Mass Spectra were taken at 70 Ev; a scan interval of 0.5s and fragments from 40 to 550 Da.

Identification of compounds:

Interpretation on mass spectrum GC-MS was conducted using the database of national institute standard and technology (NIST) having more than 62,000 patterns. The spectrum of the unknown component was compared with spectrum of the known components stored in the NIST library the name , molecular weight and structure of the components of the test materials were ascertained.

RESULTS AND DISCUSSION

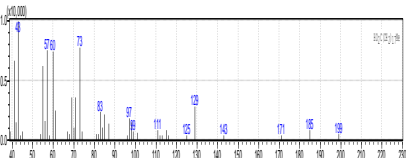
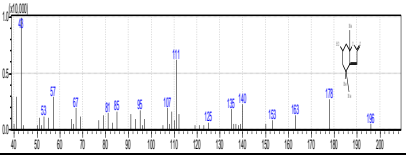
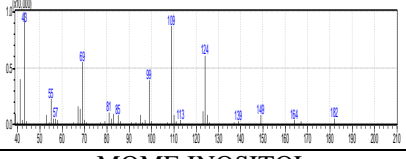
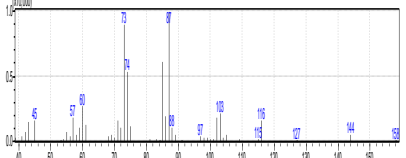
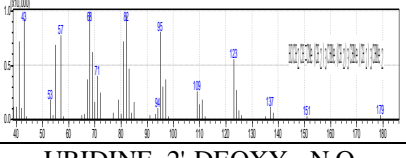
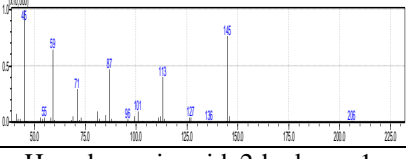
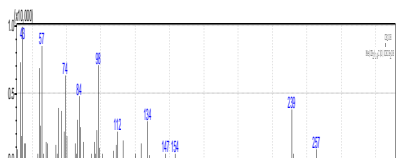
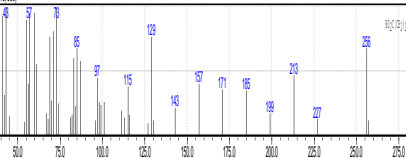
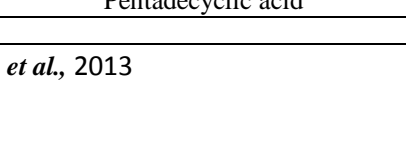
The identified compounds of the leaves of Wattakaka volubilis , their retention indices, percentage composition , chemical structure are given in Table 1. Twenty compounds were detected in methanol extract of Wattakaka volubilis (L.F) Stapf leaf. The results revealed that Dodecanoic Acid (11.32%) . was found to be the major component followed by 9- Octadecenoic acid(Z) -9 Octadecenyl ester, (Z) (11.09%), 9-Octadecenoic acid,(Z) and Elaidinsaeure(7.87%). Hexadecanoic acid (5.06%),

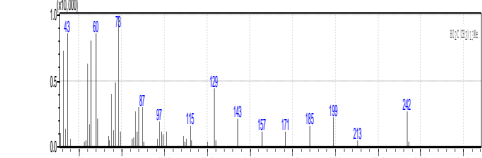
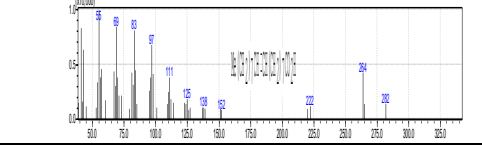
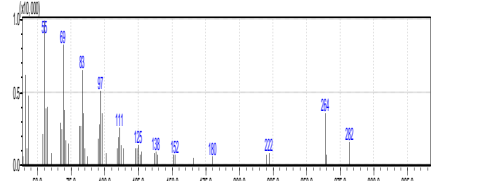
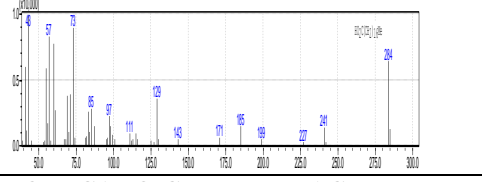
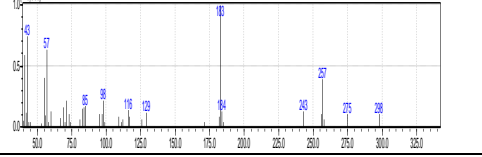
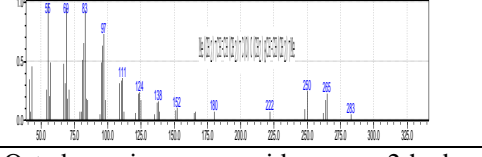
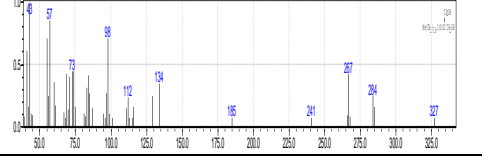
Pentacyclic acid (4.26%) , were found as the major compound in methanol extract of Wattakaka volubilis (L.F) Stapf leaf . Very small quantity. Uridine , 2' -Deoxy- n, o-permethyliert(1.063%) 9 - Octadecanoic acid (z) – (CAS) oleic acid, elaidinsaeure, hexadecanoic acid , anti inflammatory & antiarthretic and anticarcinogenic activity as reported by earlier workers^[5,6, 7] hypocholesterolemic , hematicide, 5, alpha reductase inhibitor , antiacne, hepatoprotective activities^[8] antioxidant and anticancer activity respectively^[9] . Dodecanoic acid, (1- hydroxyl

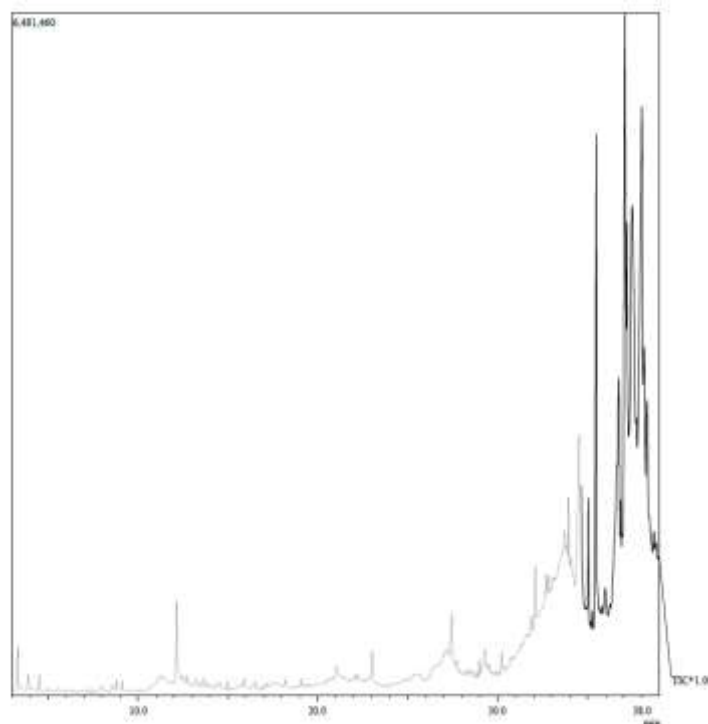
methyl, 1,2 –ethane ediy ester is detected in Wattakaka volubilis leaf which was also found to have potential antibacterial and antifungal activity present in the essential oil may be useful for the management of eye pains and inflammatory conditions arising from bacterial and fungal infections as well as bruise and erupted skins^[10,11]. Such as dodecanoic acid constitute a novel class of pharmaceuticals for the treatment of cancer, atherosclerosis, inflammatory disease.

Table:1 Components detected in Wattakaka volubilis leaf.

| Compound Name | Retention Time | Peak Area % | Molecular Formula | Molecular Weights |
|---|----------------|-------------|-------------------|-------------------|
| 1,3-Dioxolane, 4-methyl-2-pentadecyl- (CAS) 2-PENTADECYL-4-METHYL-1,3-DIOXOLANE | 12.139 | 1.16 | C19 H38 O2 | 298 |
| 3-PENTANOL, 2,2,4,4-TETRAMETHYL- | 12.139 | 1.16 | C9 H20 O | 144 |
| Dodecanoic acid (CAS) Lauric acid | 27.515 | 1.25 | C12 H24 O2 | 200 |
| Tridecanoic acid (CAS) Tridecylic acid | 27.515 | 1.25 | C13 H26 O2 | 214 |
| Undecanoic acid (CAS) Undecylic acid | 27.515 | 1.25 | C11 H22 O2 | 186 |
| Eicosanoic acid (CAS) Arachidic acid | 32.184 | 1.43 | C20 H40 O2 | 312 |
| Octadecanoic acid (CAS) Stearic acid | 32.184 | 1.43 | C18 H36 O2 | 284 |

| | | | | |
|---|--------|-------|---------------|-----|
| <p>Nonadecanoic acid (CAS) n-Nonadecanoic acid</p>  | 32.184 | 1.43 | C19 H38 O2 | 298 |
| <p>(-)-Loliolide \$\$ 2(4H)-Benzofuranone, 5,6,7,7a-tetrahydro-6-hydroxy-4,4,7a-trimethyl-, (6S-cis)- (CAS) Loliolide</p>  | 32.774 | 1.59 | C11 H16 O3 | 196 |
| <p>4,4,8-TRIMETHYL-NON-7-EN-2-ONE</p>  | 32.940 | 1.36 | C12 H22 O | 182 |
| <p>MOME INOSITOL</p>  | 33.501 | 2.03 | C7 H14 O6 | 194 |
| <p>2-Hexadecen-1-ol, 3,7,11,15-tetramethyl-, [R*,R*-(E)]- (CAS) Phytol</p>  | 33.820 | 1.84 | C20 H40 O | 296 |
| <p>URIDINE, 2'-DEOXY-, N,O-PERMETHYLIERT</p>  | 34.027 | 1.063 | C12 H18 N2 O5 | 270 |
| <p>Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester (CAS) 2-Monopalmitin</p>  | 34.613 | 5.06 | C19 H38 O4 | 330 |
| <p>Hexadecanoic acid (CAS) Palmitic acid</p>  | 35.491 | 4.26 | C16 H32 O2 | 256 |
| <p>Pentadecyclic acid</p>  | 35.491 | 4.26 | C15 H30 O2 | 242 |

| | | | | |
|---|--------|-------|------------|------|
|  <p>Mass spectrum showing relative intensity (0.0 to 1.0) versus m/z (50.0 to 350.0). Major peaks are labeled at m/z 43, 69, 79, 97, 115, 129, 145, 157, 171, 185, 199, 213, and 241.</p> | | | | |
| <p>9-Octadecenoic acid (Z)- (CAS) Oleic acid</p>  <p>Mass spectrum showing relative intensity (0.0 to 1.0) versus m/z (50.0 to 350.0). Major peaks are labeled at m/z 43, 69, 83, 97, 111, 125, 139, 153, 167, 181, 195, 209, 223, 237, 251, 265, 279, 293, 307, and 321.</p> | 37.089 | 7.87 | C18 H34 O2 | 282 |
| <p>ELAIDINSÄURE</p>  <p>Mass spectrum showing relative intensity (0.0 to 1.0) versus m/z (50.0 to 350.0). Major peaks are labeled at m/z 43, 69, 83, 97, 111, 125, 139, 153, 167, 181, 195, 209, 223, 237, 251, 265, 279, 293, 307, and 321.</p> | 37.089 | 7.87 | C18 H34 O2 | 282 |
| <p>Octadecanoic acid (CAS) Stearic acid</p>  <p>Mass spectrum showing relative intensity (0.0 to 1.0) versus m/z (50.0 to 350.0). Major peaks are labeled at m/z 43, 57, 71, 85, 99, 113, 127, 141, 155, 169, 183, 197, 211, 225, 239, 253, 267, 281, 295, 309, 323, and 337.</p> | 37.211 | 3.65 | C18 H36 O2 | 284 |
| <p>DODECANOIC ACID, (HYDROXYMETHYL)-1,2-ETHANEDIYL ESTER</p>  <p>Mass spectrum showing relative intensity (0.0 to 1.0) versus m/z (50.0 to 350.0). Major peaks are labeled at m/z 43, 57, 71, 85, 99, 113, 127, 141, 155, 169, 183, 197, 211, 225, 239, 253, 267, 281, 295, 309, 323, and 337.</p> | 37.482 | 11.32 | C27 H52 O5 | 456 |
| <p>9-Octadecenoic acid (Z)-, 9-octadecenyl ester, (Z)- (CAS) 9-CIS-OCTADECENYL 9-CIS-OCTADECENOATE</p>  <p>Mass spectrum showing relative intensity (0.0 to 1.0) versus m/z (50.0 to 350.0). Major peaks are labeled at m/z 43, 69, 83, 97, 111, 125, 139, 153, 167, 181, 195, 209, 223, 237, 251, 265, 279, 293, 307, 321, and 335.</p> | 38.028 | 11.09 | C36 H68 O2 | 533 |
| <p>Octadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester (CAS) 2-Monostearin</p>  <p>Mass spectrum showing relative intensity (0.0 to 1.0) versus m/z (50.0 to 350.0). Major peaks are labeled at m/z 43, 57, 71, 85, 99, 113, 127, 141, 155, 169, 183, 197, 211, 225, 239, 253, 267, 281, 295, 309, 323, and 337.</p> | 38.318 | 2.41 | C21 H42 O4 | 3.58 |



GC-MS Chromatogram of the methanol extract of Wattakaka volubilis.

CONCLUSION

The essential compounds in the methanol extract of *Wattakaka volubilis* have been screened using this analysis of anticancer, antimicrobial and anticarcinogenic and antioxidant properties, which are of importance for the development of new therapeutic agents. Further work needs to be done in the future to correlate the specific compound with its biological property.

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