

Original Research Article

**GC-MS analysis of ethanol extract of *Wattakaka volubilis* (L.f.) stapf. leaf**

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**Abstract**

*Wattakaka volubilis* (L.f) Stapf known to the Palliyars as “Kurinjan” is an important medicinal plant. The Palliyar tribe, inhabitants of Sirumalai hills, Western Ghats, Tamil Nadu, India, use this plant as antidiabetic. The present investigation deals with GC-MS analysis of ethanol extract of the above said plant. Fifteen compounds were identified.

**Keywords:** GC-MS, Antidiabetic, Ethnomedicine, *Wattakaka volubilis*.

**Introduction**

The plants of *Wattakaka volubilis* (L.f) Stapf belongs to family Asclepiadaceae. It is commonly known as “Kurinjan” in Palliyar tribals of Sirumalai Hills, Western Ghats, Tamil Nadu, India. Palliyar tribe, use the leaf of this plant to reduce blood glucose level and helps in increase insulin level. To our knowledge, no chemical analysis has been previously reported on this plant. The present communication deals with the GC-MS analysis of ethanol extract of said plant leaf.

**Materials and Methods**

The leaves of *Wattakaka volubilis* (L.f) Stapf were collected from the Sirumalai hills, Western Ghats, Tamil Nadu. The leaf samples were air dried and powdered. Required quantity of powder was weighted and transferred to stopped flask and treated with the ethanol until the powder is fully immersed. The flask was shaken every hour for the first 6 hours and then it was kept aside and again shaken after 24 hours. This process was repeated for 3 days and then 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.

**GC-MS Analysis**

GC-MS was performed with GC Clarus 500 Perkin Elmer equipment. Compounds were separated on Elite-I capillary column (100% Dimethylpolysiloxane). Samples were injected with a split ratio of 10:1 with a flow rate of helium 1 ml/min. (carrier gas). Mass detector – Turbo Mass gold – Perkin Elmer Software – Turbo Mass 5.1 was used as a detector. Other conditions are oven temperature up to 110° - 2 min. hold; upto 280° at the rate of 5 deg/min<sup>-9</sup> minutes hold. Injector temperature was maintained at 250° C. The constituents were identified after comparison with those available in the Computer Library (NIST ver. 2.1) attached to the GC-MS instrument and reported.

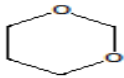
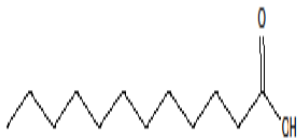

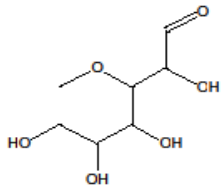
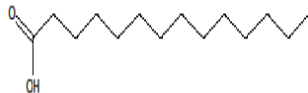
**Results and Discussion**


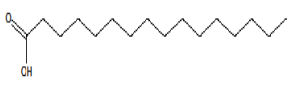
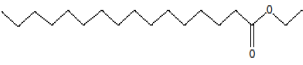

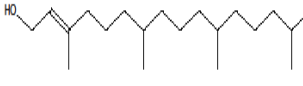
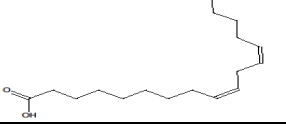
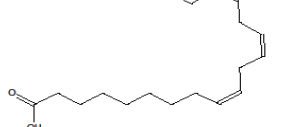
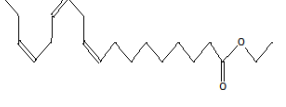
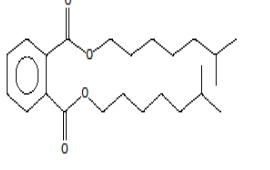
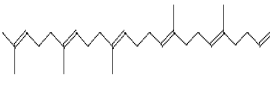
The results pertaining to the GC-MS analysis are given in Figure.1 and Table 1. Fifteen compounds were detected in ethanol extract of *Wattakaka volubilis* (L.f) Stapf leaf. The results revealed that phytol (29.20%) was found to be the major component followed by 2, 6, 10, 14, 18, 22-Tetracosahexaene, 2, 6, 10, 15, 19, 23 – hexamethyl –(all- E)- – hexamethyl –(all- E)-

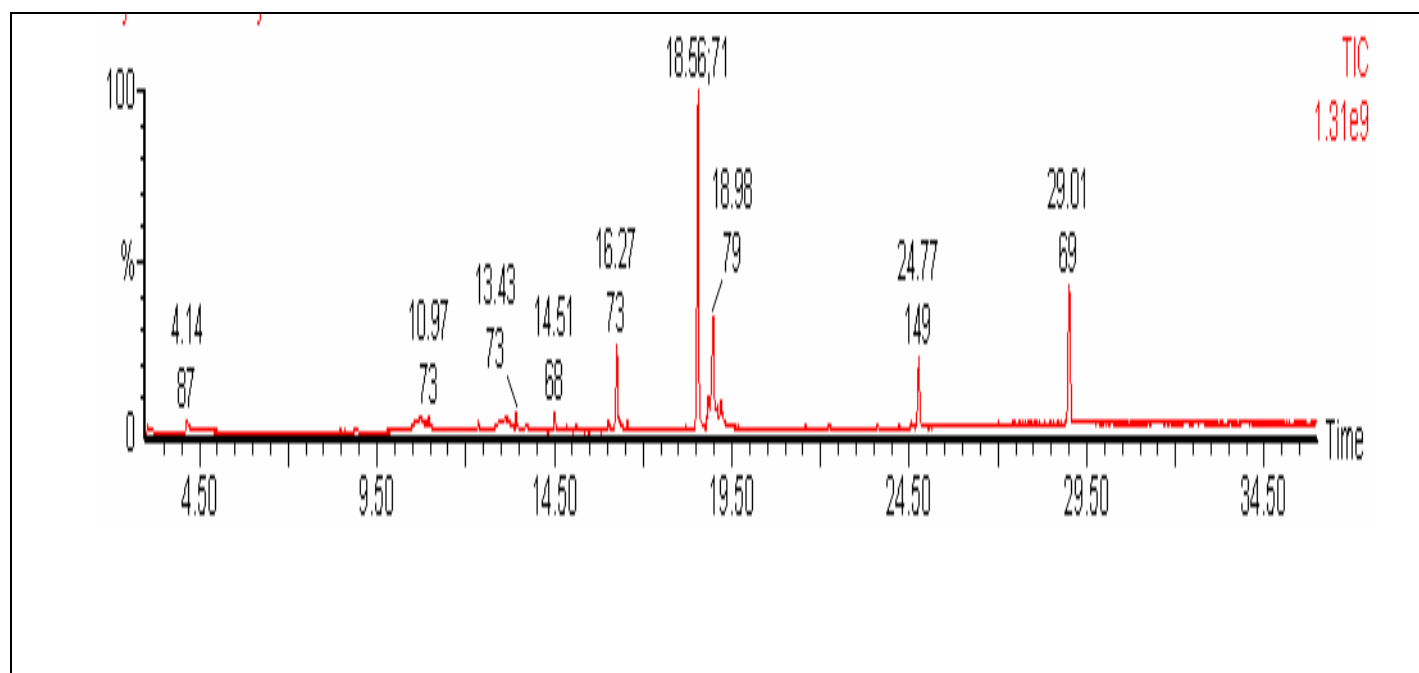
(Synonyms : trans-squalene ) (15.53%), 9, 12, 15-Octadecatrienoic acid, (Z,Z,Z) - (15.11%), n-Hexadecanoic acid (8.29%), 1,2, Benzenedicarboxylic acid, diioctylester (7.15%), 3-O-Methyl - d- glucose (7.01%), 9,12,15, Octadecatrienic acid, ethyl ester (Z,Z,Z)- (4.00%) were found as the major components in the ethanol extract of Wattakaka volubilis (L.f) Stapf leaf. Very small quantity (0.25%) of 9,12,15 - Octadecatrienoic acid, methyl ester, (Z,Z,Z)- (Omega-3-fatty acid) were reported. Among the identified phytochemicals (Table.1) Dodecanoic acid, Tetradecanoic acid, n-Hexadecanoic acid, and squalene have the property of anti-oxidant activity, 9,12, Octadecatrienoic acid (Z,Z,Z)- and 9, 12, 15-Octadecatrienoic acid (Z,Z,Z)- have the property

of antiinflammatory and antiarthritic as reported by earlier workers,[1,2]. Phytol is detected in Wattakaka volubilis leaf which was also found to be effective at different stages of the arthritis. It was found to give good as well as preventive and therapeutic results against arthritis. The results show that reactive oxygen species-promoting substances such as phytol constitute a promising novel class of pharmaceuticals for the treatment of rheumoid arthritis and possibly other chronic inflammatory diseases [3].Omega-3-fatty acids have been found to be essential for normal growth and development and may play an important role in the prevention and treatment of coronary artery disease, hypertension, diabetes, and arthritis, other inflammatory and auto immune disorders and cancer [4, 5, 6].

**Table.1. Components detected in Wattakaka volubilis leaf.**

Sl. No.	RT	Name of Compound	Molecular Formula	Molecular weight	Peak Area %	Structures
1	4.14	1,3-Dioxane	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	88	1.99	
2	10.97	Dodecanoic acid	C <sub>12</sub> H <sub>24</sub> O <sub>2</sub>	200	2.97	
3	12.36	6-(3-Hydroxy-but-1-enyl)-1,5,5-trimethyl-7-oxabicyclo[4.1.0]heptan-2-ol	C <sub>13</sub> H <sub>22</sub> O <sub>3</sub>	226	1.25	
4	13.16	3-O-Methyl-d-glucose	C <sub>7</sub> H <sub>14</sub> O <sub>6</sub>	194	7.01	
5	13.43	Tetradecanoic acid	C <sub>14</sub> H <sub>28</sub> O <sub>2</sub>	228	2.00	

6	14.51	3,7,11,15-Tetramethyl-2-hexadecen-1-ol	$C_{20}H_{40}O$	296	1.68	
7	16.27	n-Hexadecanoic acid	$C_{16}H_{32}O_2$	256	8.29	
8	16.56	Hexadecanoic acid, ethyl ester	$C_{18}H_{36}O_2$	284	0.69	
9	18.19	9,12,15-Octadecatrienoic, methyl ester, (Z,Z,Z)-	$C_{19}H_{32}O_2$	292	0.25	
10	18.56	Phytol	$C_{20}H_{40}O$	296	29.20	
11	18.85	9,12-Octadecadienoic acid (Z,Z)-	$C_{18}H_{32}O_2$	280	2.88	
12	18.98	9,12,15-Octadecatrienoic, (Z,Z,Z)-	$C_{18}H_{30}O_2$	278	15.11	
13	19.20	9,12,15-Octadecatrienoic acid, ethyl ester, (Z,Z,Z)-	$C_{20}H_{34}O_2$	306	4.00	
14	24.77	1,2-Benzenedicarboxylic acid, diisooctyl ester	$C_{24}H_{38}O_4$	390	7.15	
15	29.01	2,6,10,14,18,22-Tetracosahexane, 2,6,10,15,19,23-hexamethyl-, (all-E)- [Synonyms: trans-Squalene]	$C_{30}H_{50}$	410	15.53	



**Fig. 1.** GC-MS Chromatogram of the ethanol extract of Wattakaka volubilis leaf.

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