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## PHYTOCHEMICAL ANALYSIS OF LEAF EXTRACTS OF *WATTAKAKA VOLUBILIS* LINN. (STAPF) BY GC-MS METHOD

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### ABSTRACT

The aim of the study was to investigate the phytochemical compounds of *Wattakaka volubilis* ethanolic leaf extracts. The phytochemical compounds were screened by GC-MS method. The ethanolic leaf extracts presented 32 bioactive compounds. The identification of phytochemical compounds is based on the peak area, molecular weight and molecular formula. Diethyl phthalate  $C_{12}H_{14}O_4$  has peak area 37.31, 2-pentanone, 3, 3, 4, 4-tetramethyl  $C_9H_{18}O$  has peak area 17.58 and propane 1, 1, 3-trimethoxy  $C_9H_{20}O_3$  has peak area 10.20 and the results were presented.

**INTRODUCTION:** Plants have been an important source of medicines for thousands of years. Everyday, the World Health Organization estimates that upto 80 percent of people still rely mainly on traditional remedies such as herbs for their medicines. Its civilization is very ancient and the country of a whole has long been known for its rich resources medicinal plants. Today, ayurvedic, homeo and unani physicians utilize numerous species of medicinal plants are possibly utilized as antiseptic and antimicrobial substances.

*Wattakaka volubilis* (Linn F.) Stapf (Family-Asclipidiaceae) is a large climber with green flowers in drooping umbels with smooth bank and ash coloured leaves rounded at the base. It is found in India and South East Asia. The root is applied to snake bites and given to women to cure head ache after child birth and the leaves are applied to boils and abscesses to promote suppuration. It is an emetic, diaphoretic and diuretic<sup>2</sup>. Traditional healers of Kerala used its leaves to treat inflammatory and painful conditions<sup>3</sup>. However, till date no scientific validation of these properties has been reported.

Here, the present study has been made to identify the Phytochemical compounds of *W. volubilis* by GC-MS analysis.

### MATERIALS AND METHODS:

**Collection of Plant Material:** The plant *W. volubilis* was collected from the garden of Jamal Mohamed College, Tiruchirappalli. The plant was identified and voucher specimen was deposited in the Rapinet Herbarium, St. Joseph's College, Tiruchirappalli.

**Preparation of Extracts:** 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 was extracted using soxhlet apparatus with ethanol as solvent (50-60°C) for 72 hrs.

The obtained extracts were evaporated in vacuum to give residues. A semi solid residual extract was obtained. It was stored at 4°C until used. When needed, the residual extract was dissolved in distilled water and used in the study. The extracts preparations were done as previously described by Allade and Irobi<sup>4</sup>.

**GC-MS Analysis:** The GC-MS analysis of unknown compounds of *W. volubilis* deals with using a Clarus 500 Perkin Elmer Gas Chromatography ionizes compounds and measures their mass number equipped with Elite-5-Capillary Column (5% phenyl 95% dimethyl poly siloxane) (30 mm x 0.25 mm ID x 0.25  $\mu$ mdf) and mass detector turbomass gold of the company which was operated at in EI mode. Helium was carried the gas at the flow rate of 1 ml / min, the injector was operated at 280°C and the oven temperature was programmed as follows : 70°C @ 8 °C/min to 150°C (1 min) @ 8°C / min to 280°C (10 min). The identification of components was based on comparison of their mass spectra with those of Wiley and NBS Libraries and those described by Adams <sup>5</sup> as

well as on comparison of their retention indices with literature <sup>6</sup>.

**RESULTS AND DISCUSSION:** The present study carried out on the *W. volubilis* revealed the presence of medicinal active constituents. In GC-MS analysis 32 bioactive phytochemical components were identified in the ethanolic extract of *W. volubilis*. The identification of phytochemical compounds is based on the peak area, molecular weight and molecular formula. Diethyl phthalate (C<sub>12</sub>H<sub>14</sub>O<sub>4</sub>) with RT 16.55 has peak area 37.31, 2-pentanone, 3, 3, 4, 4-tetramethyl (C<sub>9</sub>H<sub>18</sub>O) with RT 14.93 has peak area 17.58 and propane 1, 1, 3-trimethoxy (C<sub>9</sub>H<sub>20</sub>O<sub>3</sub>) with RT 6.84 has peak area 10.20, the results were presented in **table 1**, **figure 1**.

**TABLE: CONSTITUENTS AND PERCENTAGE COMPOSITION OF THE ETHANOLIC LEAF EXTRACT OF *W. VOLUBILIS***

S. No	Peak name	Retention time	Peak area	% Peak area
1	Propane, 1,1,3-triethoxy- Formula: C <sub>9</sub> H <sub>20</sub> O <sub>3</sub> MW: 176	6.84	6359325	10.2012
2	Ethane, 1,1-diethoxy- Formula: C <sub>6</sub> H <sub>14</sub> O <sub>2</sub> MW: 118	7.29	99703	0.1599
3	Tridecane Formula: C <sub>13</sub> H <sub>28</sub> MW: 184	9.17	442012	0.7090
4	Benzoic acid, 2-hydroxy-, methyl ester Formula: C <sub>8</sub> H <sub>8</sub> O <sub>3</sub> MW: 152	9.34	3260023	5.2295
5	1,2-Benzenedicarboxylic acid Formula: C <sub>8</sub> H <sub>6</sub> O <sub>4</sub> MW: 166	11.74	104790	0.1681
6	Decane, 6-ethyl-2-methyl- Formula: C <sub>13</sub> H <sub>28</sub> MW: 184	13.02	573829	0.9205
7	1,2,3,4-Cyclohexanetetrol Formula: C <sub>6</sub> H <sub>12</sub> O <sub>4</sub> MW: 148	13.41, 14.27, 13.71	1753306	2.8125
8	Dodecane, 1-chloro- Formula: C <sub>12</sub> H <sub>25</sub> Cl MW: 204	14.42	103779	0.1665
9	1-Dodecanol Formula: C <sub>12</sub> H <sub>26</sub> O MW: 186	14.48	139343	0.2235
10	2-Pentanone, 3,3,4,4-tetramethyl- Formula: C <sub>9</sub> H <sub>18</sub> O MW: 142	14.93	10961298	17.5833
11	n-Decanoic acid Formula: C <sub>10</sub> H <sub>20</sub> O <sub>2</sub> MW: 172	15.96	145530	0.2334
12	Diethyl Phthalate Formula: C <sub>12</sub> H <sub>14</sub> O <sub>4</sub> MW: 222	16.55	23263070	37.3169
13	1-Undecanol	18.01	282572	0.4533

	Formula: C <sub>11</sub> H <sub>24</sub> O MW: 172			
14	Isooctanol Formula: C <sub>8</sub> H <sub>18</sub> O MW: 130	18.50	52380	0.0840
15	2-Piperidinone, N-[4-bromo-n-butyl]- Formula: C <sub>9</sub> H <sub>16</sub> BrNO MW: 233 Alkaloid (piperidine type)	19.13	146969	0.2358
16	Sulfurous acid, 2-ethylhexyl isohexyl ester Formula: C <sub>14</sub> H <sub>30</sub> O <sub>3</sub> S MW: 278	19.53	247774	0.3975
17	3-Butylindolizidine Formula: C <sub>12</sub> H <sub>23</sub> N MW: 181 Alkaloid (indole group)	19.71	53083	0.0852
18	3,7,11,15-Tetramethyl-2-hexadecen-1-ol Formula: C <sub>20</sub> H <sub>40</sub> O MW: 296	20.05,20.64	1880117	3.0159
19	á-k-Strophanthin Formula: C <sub>36</sub> H <sub>54</sub> O <sub>14</sub> MW: 710	20.16,21.60, 31.73	2295909	3.6829
20	Uridine, 2'-deoxy-3-methyl-3',5'-di-O-methyl- Formula: C <sub>12</sub> H <sub>18</sub> N <sub>2</sub> O <sub>5</sub> MW: 270	20.28	92554	0.1485
21	1-Hexadecyne Formula: C <sub>16</sub> H <sub>30</sub> MW: 222	20.38	244581	0.3923
22	Undecanoic acid Formula: C <sub>11</sub> H <sub>22</sub> O <sub>2</sub> MW: 186	21.76	749327	1.2020
23	Decanoic acid, ethyl ester Formula: C <sub>12</sub> H <sub>24</sub> O <sub>2</sub> MW: 200	22.10	382719	0.6139
24	Cyclohexanone, 2-ethyl-4-methoxy- Formula: C <sub>9</sub> H <sub>16</sub> O <sub>2</sub> MW: 156	22.26	90720	0.1455
25	4-Oxazolecarboxylic acid, 4,5-dihydro-2-phenyl-, 1-methylethyl ester Formula: C <sub>13</sub> H <sub>15</sub> NO <sub>3</sub> MW: 233	23.12	26531	0.0426
26	Phytol Formula: C <sub>20</sub> H <sub>40</sub> O MW: 296	23.57	1919497	3.0791
28	Oxirane, (7-octenyl)- Formula: C <sub>10</sub> H <sub>18</sub> O MW: 154	24.21	177971	0.2855
29	Hexadecane, 1,2-epoxy Formula: C <sub>16</sub> H <sub>32</sub> O MW: 240	26.01	450888	0.7233
30	Hexanedioic acid, mono(2-ethylhexyl)ester Formula: C <sub>14</sub> H <sub>26</sub> O <sub>4</sub> MW: 258	26.64	970462	1.5567
31	Pentadecanal- Formula: C <sub>15</sub> H <sub>30</sub> O MW: 226	28.17	2326460	3.7319
32	trans-Squalene Formula: C <sub>30</sub> H <sub>50</sub> MW: 410	32.24	2742765	4.3997
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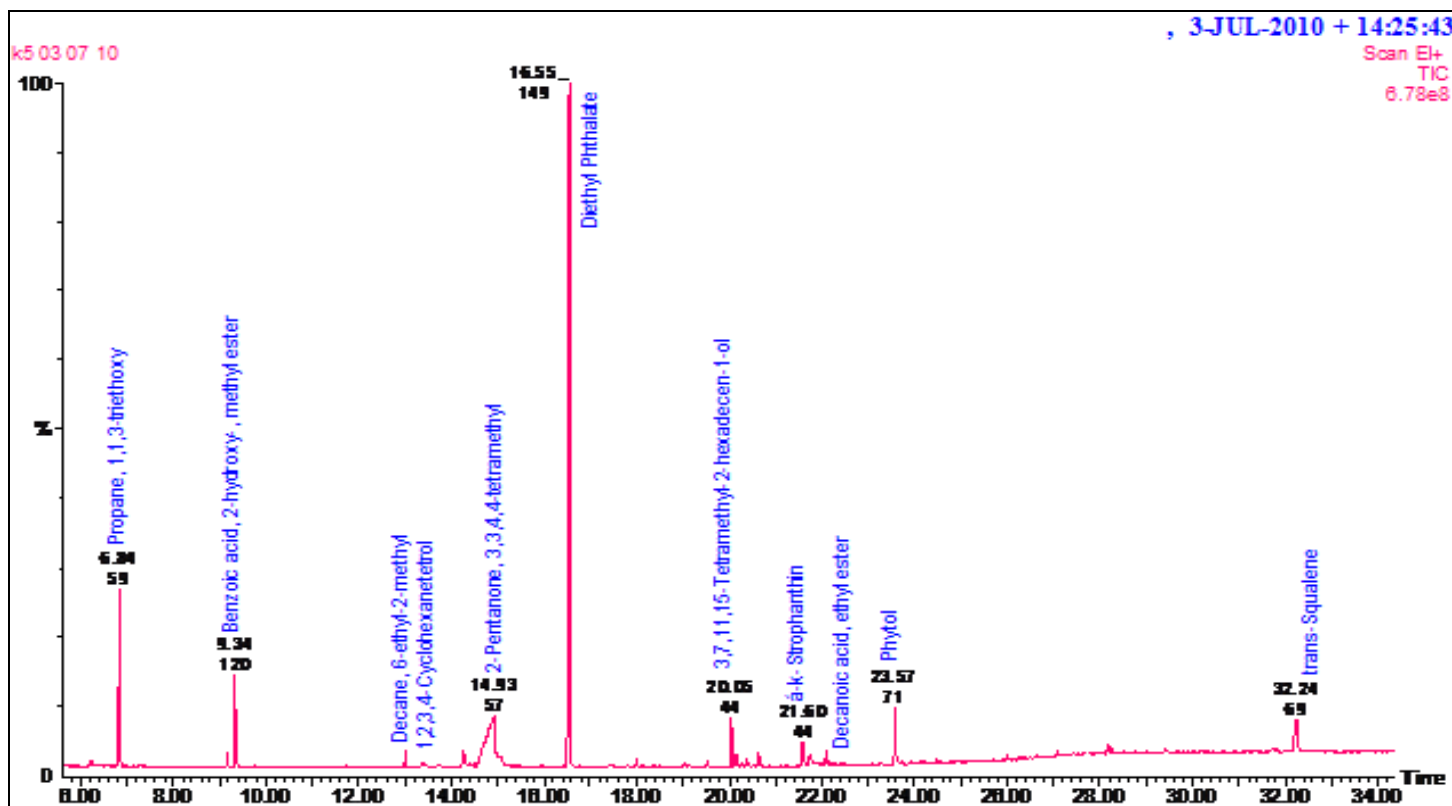


FIGURE 1: GC-MS CHROMATOGRAM OF ETHANOLIC EXTRACTS OF *W. VOLUBILIS*

Arunkumar and Muthuselvam reported in the GC-MS analysis, 26 bioactive phytochemical compounds were identified in the ethanolic extract of *Aloe vera*. The identification of phytochemical compounds is based on the peak area, molecular weight and molecular formula. *J. sitostera* ( $C_{29}H_{50}O$ ) with RT 38.78 has peak area 13.19%, Oleic Acid ( $C_{18}H_{34}O_2$ ) with RT (21.85) and 9,12,15-Octadecatrienoic acid methyl ester (Z, Z, Z) ( $C_{19}H_{33}C_2$ ) with RT 22.6 ranks next having peak area 11.74% and 11.36% respectively <sup>7</sup>.

Investigated fourteen aromatic and 24 aliphatic acids were determined by GC-MS analysis of acidic fractions obtained from *Paronia peregrine* and *Paeonia tenifolia* roots. Benzoic acid and its monohydroxy-dihydroxy and tri-hydroxy derivatives are the main acid components of both *Paronia* species. Some fractions could serve as a source of benzoic 4-hydroxy benzoic, vanillic and gallic acids as well as of ethyl gallate <sup>8</sup>.

GC-MS results revealed phenols, aromatic carboxylic acids and esters in the chloroform extract <sup>9</sup>. The GC-MS analysis of a botanically certified Oleogama Resin of *Boswellia sacra* essential oil revealed the presence of 34 monoterpenes and 16-sesquiterpens <sup>10</sup>.

**CONCLUSION:** This study revealed the presence of 32 phytochemical compounds. The identification of the compounds *W. volubilis* could be exploited for new potent antidiabetic agents.

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