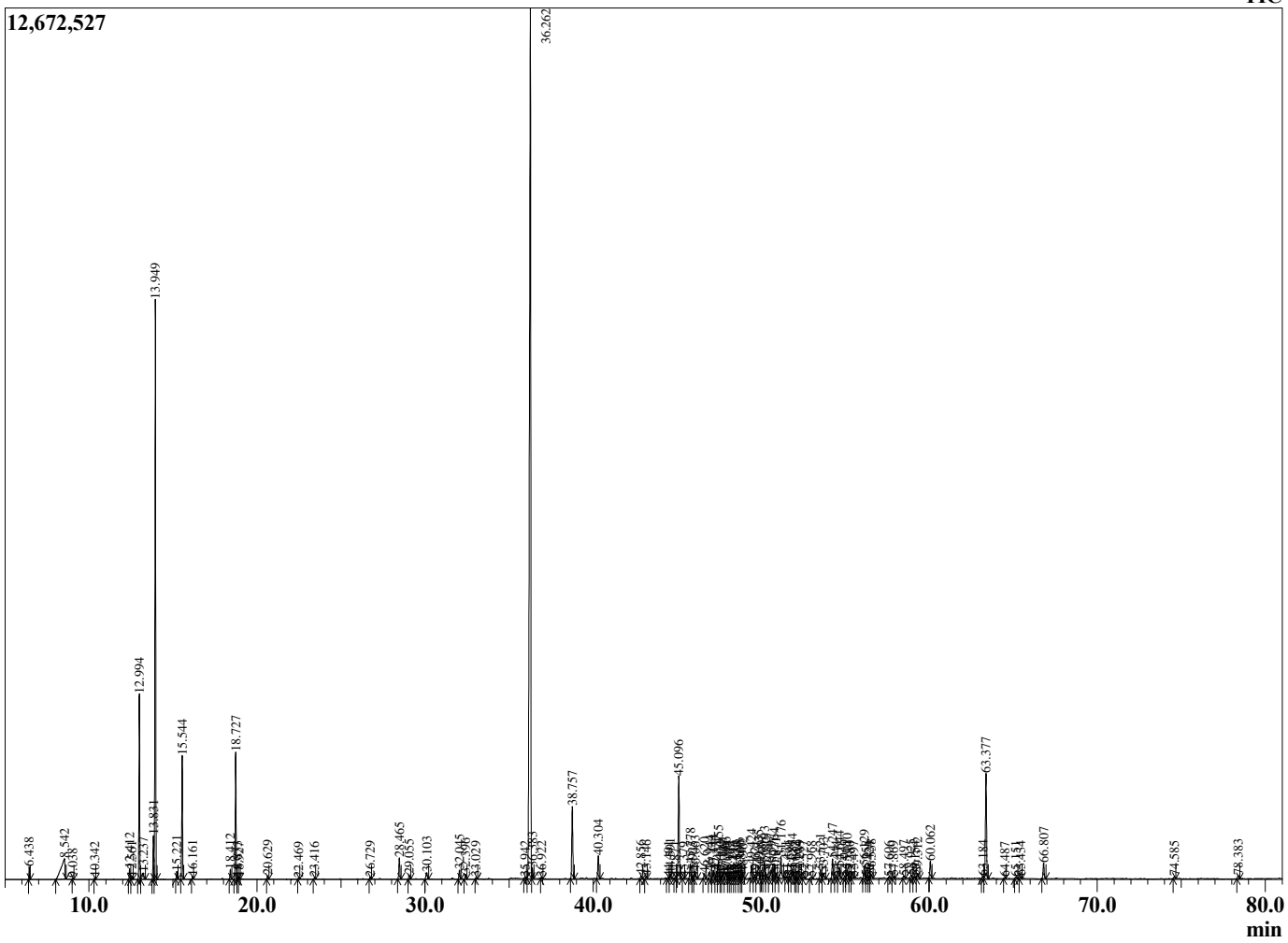
Sample Information

Analyzed by : Dr. Robert S. Pappas
Analyzed : 10/20/2020 2:03:32 AM
Sample Type : Essential Oil
Sample Name : Valerian -
Sample ID BIOAROMA : BA29IAS
Injection Volume : 0.10
Instrument ID: : GC-3

Chromatogram Valerian - BIOAROMA



Comments:

The analysis of this Valerian batch sample meets the expected chemical profile for authentic essential oil of *Valeriana officinalis*. No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Peak Report TIC

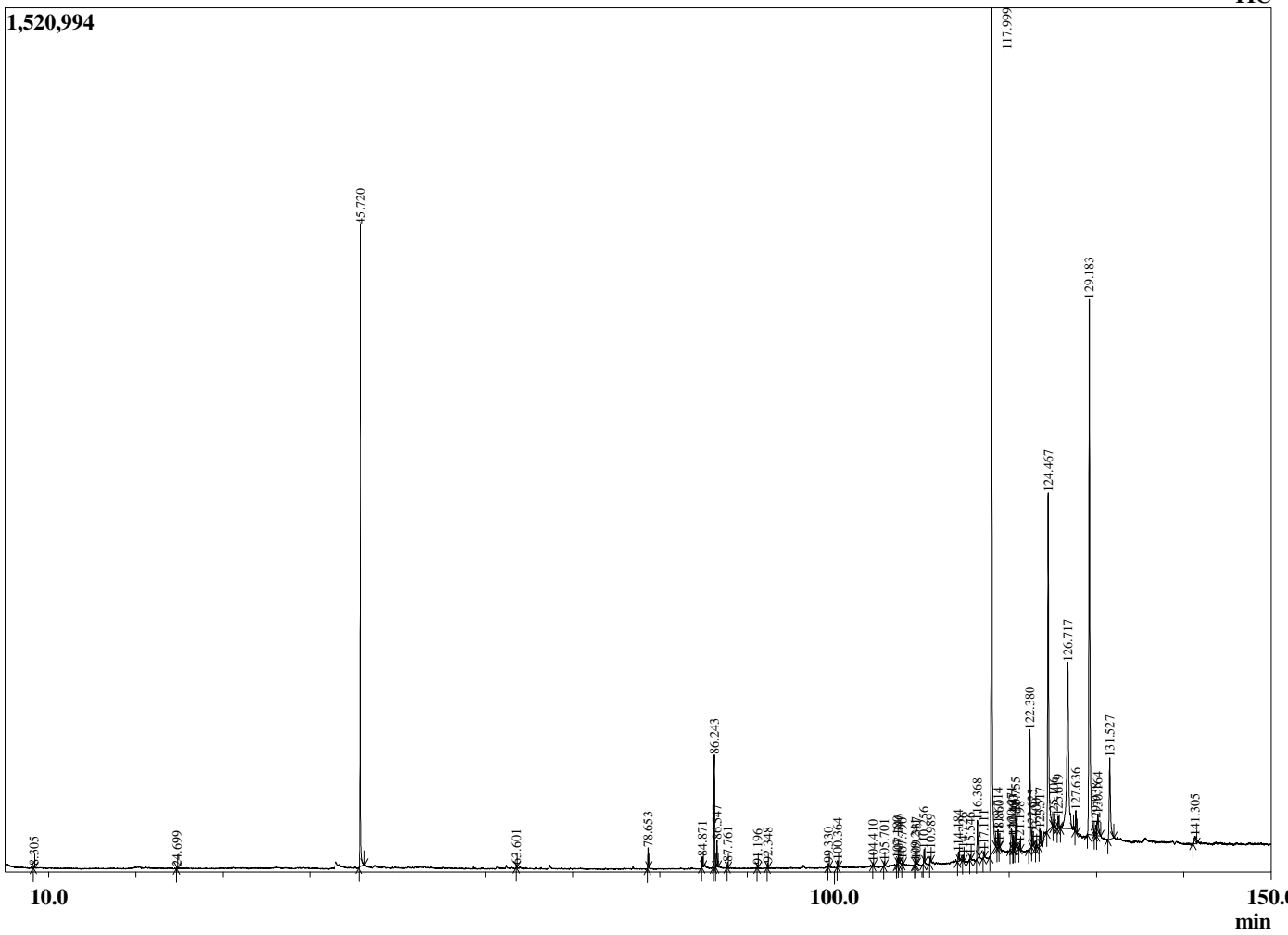
R.Time	Name	Area%
6.438	Methyl isovalerate	0.21
8.542	Isovaleric acid	2.57
9.038	Ethyl isovalerate	0.03
10.342	Methyl hexanoate	0.04
12.412	Tricyclene	0.26
12.561	alpha-Thujene	0.06
12.994	alpha-Pinene	4.75
13.237	3-Methyl valeric acid	0.45
13.831	alpha-Fenchene	1.23
13.949	Camphene	15.86
15.221	Sabinene	0.20
15.544	beta-Pinene	3.32
16.161	Myrcene	0.07
18.412	para-Cymene	0.27
18.727	Limonene	3.62
18.833	beta-Phellandrene	0.07
18.927	1,8-Cineole	0.04
20.629	gamma-Terpinene	0.11
22.469	Terpinolene	0.04
23.416	Linalool	0.05
26.729	Camphor	0.07
28.465	Borneol	0.69
29.055	Terpinen-4-ol	0.14
30.103	Myrtenol	0.29
32.045	Thymol methyl ether	0.28
32.396	Carvacrol methyl ether	0.16
33.029	Isothymol methyl ether	0.05
35.942	Unidentified	0.05
36.262	Bornyl acetate	38.30
36.383	Isobornyl acetate	0.32
36.922	trans-Pinocarvyl acetate	0.06
38.757	Myrtenyl acetate	2.50
40.304	alpha-Terpinyl acetate	0.82
42.856	beta-Patchoulene	0.13
43.146	beta-Elemene	0.09
44.491	Unidentified	0.06
44.591	Thymohydroquinone dimethyl ether	0.16
44.871	alpha-Cedrene	0.04
45.096	beta-Caryophyllene	3.90
45.379	Unidentified	0.03
45.778	beta-Gurjuenene	0.56
45.925	trans-alpha-Bergamotene	0.06
46.063	alpha-Guaiene	0.30
46.620	(E)-beta-Farnesene	0.19
46.944	Seychellene	0.27
47.144	Valerna-4,7(11)-diene	0.31
47.337	alpha-Humulene	0.27
47.455	Unidentified	0.68
47.600	Alloaromadendrene	0.05
47.710	alpha-Patchoulene	0.16
47.906	Unidentified	0.23
48.000	Unidentified	0.01
48.132	Unidentified	0.02
48.297	Unidentified	0.05
48.430	Unidentified	0.06
48.537	trans-Cadina-1(6),4-diene	0.11
48.698	Itrans-beta-Ionone	0.13
48.800	alpha-Amorphene	0.06
48.902	Ar-Curcumene	0.23
49.424	beta-Selinene	0.48
49.621	trans-Murrola-4(14),5-diene	0.05
49.835	alpha-Selinene	0.66

R.Time	Name	Area%
50.002	alpha-Muurolene	0.35
50.193	alpha-Bulnesene	0.65
50.282	Unidentified	0.17
50.597	Cuparene	0.45
50.764	alpha-Alaskene	0.57
50.871	gamma-Cadinene	0.18
51.176	delta-Cadinene	0.87
51.471	Zonarene	0.06
51.690	trans-gamma-Bisabolene	0.06
51.854	Unidentified	0.35
52.032	trans-Cadina-1,4-diene	0.01
52.164	gamma-Cuprenene	0.04
52.289	Unidentified	0.12
52.527	alpha-Calacorene	0.08
52.968	alpha-Elemol	0.09
53.521	Unidentified	0.35
53.703	trans-Nerolidol	0.25
54.247	Unidentified	0.73
54.444	Unidentified	0.06
54.644	Spathulenol	0.43
54.969	Caryophyllene oxide	0.10
55.110	Unidentified	0.37
55.280	Unidentified	0.04
55.497	Unidentified	0.06
56.129	Unidentified	0.46
56.258	Unidentified	0.08
56.424	Rosifoliol	0.04
56.538	Cedrol	0.15
57.606	Unidentified	0.06
57.869	Unidentified	0.08
58.497	Unidentified	0.11
58.925	Unidentified	0.14
59.154	alpha-Cadinol	0.08
59.312	Unidentified	0.23
60.062	Patchouli alcohol	0.63
63.184	Unidentified	0.09
63.377	Valerenal	4.06
64.487	Unidentified	0.04
65.151	Unidentified	0.05
65.434	Unidentified	0.08
66.807	Unidentified	0.61
74.585	Unidentified	0.08
78.383	Unidentified	0.14
		100.00

Sample Information

Analyzed by : Dr. Robert S. Pappas
Analyzed : 8/6/2020 4:15:20 AM
Sample Type : Essential Oil
Sample Name : Vanilla CO2 -
Sample ID BIOAROMA : BA08GAG
Injection Volume : 0.10
Instrument ID: : GC-2

Chromatogram Vanilla CO2 - BIOAROMA



Peak Report TIC

R.Time	Name	Area%
8.305	2,3-Butanediol	0.03
24.699	Guaiacol	0.04
45.720	Vanillin	15.42
63.601	Unidentified	0.04
78.653	Ethyl palmitate	0.42
84.871	Linoleic acid	0.21
86.243	Ethyl linoleate	2.31
86.547	Ethyl elaidate	0.66
87.761	Ethyl stearate	0.09
91.196	(Z)-9-Tricosene	0.05
92.348	Unidentified	0.09
99.330	Unidentified	0.06
100.364	Eicosane	0.14
104.410	Unidentified	0.04
105.701	Unidentified	0.09
107.180	Unidentified	0.16
107.346	Unidentified	0.15
107.790	Nonadecane	0.08
109.241	Unidentified	0.08
109.337	Unidentified	0.12
110.256	Unidentified	0.30
110.989	Unidentified	0.16
114.184	Unidentified	0.26
114.726	Eicosane	0.11
115.546	Unidentified	0.11
116.368	Unidentified	1.10
117.111	Unidentified	0.16
117.999	Unidentified	24.31
118.714	Unidentified	0.56
118.860	Unidentified	0.09
120.271	Unidentified	0.87
120.460	Unidentified	0.19
120.493	Unidentified	0.29
120.755	Unidentified	0.68
121.198	Unidentified	0.15
122.380	Unidentified	3.33
122.625	Unidentified	0.47
123.100	Unidentified	0.17
123.517	Unidentified	0.47
124.467	Unidentified	11.21
125.106	Unidentified	0.22
125.619	Stigmasterol	0.34
126.717	Unidentified	10.43
127.636	Unidentified	0.54
129.183	Unidentified	17.95
129.938	Unidentified	0.41
130.164	Unidentified	0.91
131.527	Unidentified	3.49
141.305	Unidentified	0.41
		100.00

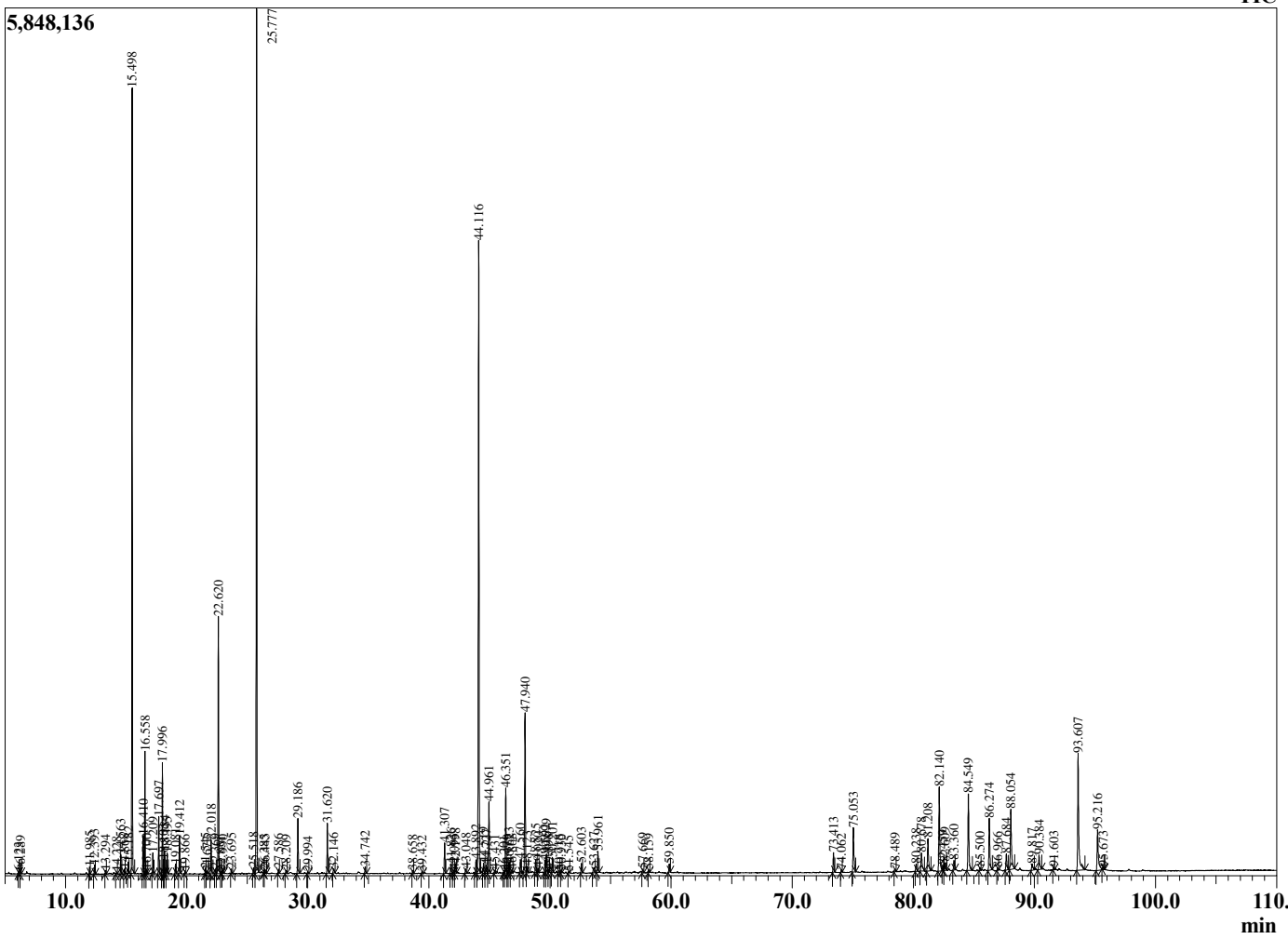
Comments:

The analysis of this Vanilla CO2 batch sample meets the expected chemical profile for authentic CO2 Extract of *Vanilla planifolia.* No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Sample Information

Analyzed by : Dr. Robert S. Pappas
Analyzed : 3/18/2021 10:49:48 AM
Sample Type : Essential Oil
Sample Name : Verbena Oil -
Sample ID BIOAROMA : BB22AAE
Injection Volume : 0.10
Instrument ID: : GC-4

Chromatogram Verbena Oil - BIOAROMA



Comments:

The analysis of this Verbena batch sample meets the expected chemical profile for authentic essential oil of *Lippia javanica.* No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Peak Report TIC

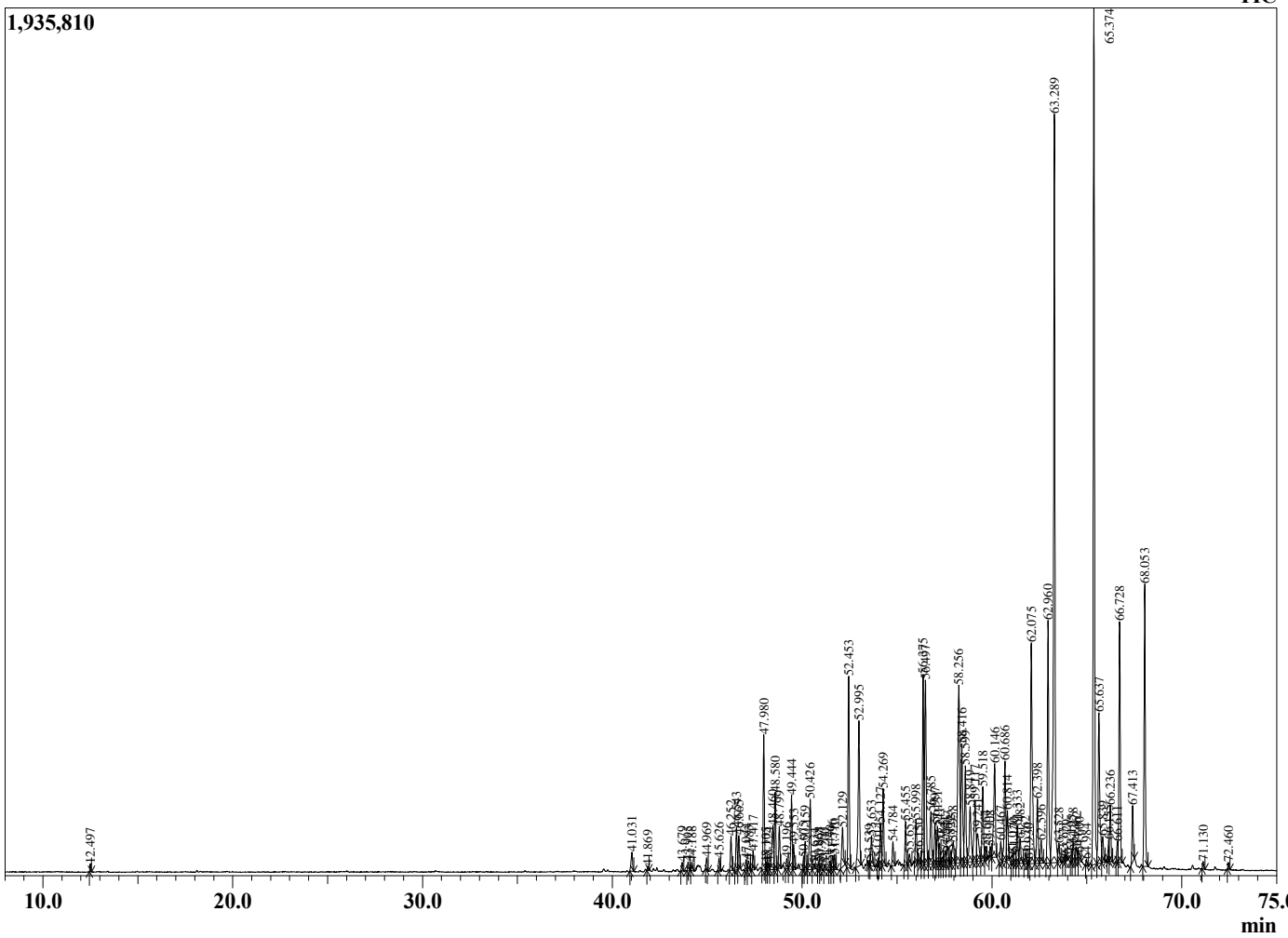
R.Time	Name	Area%
6.123	Unidentified	0.03
6.289	Unidentified	0.10
11.985	alpha-Thujene	0.11
12.393	alpha-Pinene	0.15
13.294	Camphene	0.06
14.228	Unidentified	0.04
14.563	Sabinene	0.33
14.868	beta-Pinene	0.09
15.182	Unidentified	0.19
15.498	Myrcene	13.56
16.410	Pseudolimonene	0.73
16.558	alpha-Phellandrene	2.22
16.700	delta-3-Carene	0.08
17.209	Unidentified	0.40
17.697	para-Cymene	1.07
17.996	Limonene	2.03
18.103	beta-Phellandrene	0.25
18.184	1,8-Cineole	0.45
18.395	(Z)-beta-Ocimene	0.39
19.081	(E)-beta-Ocimene	0.18
19.412	Dihydrotagetone	0.71
19.866	gamma-Terpinene	0.06
21.545	Ipsenone	0.10
21.672	Terpinolene	0.05
22.018	6,9-Epoxymyrcene	0.68
22.369	Unidentified	0.09
22.620	Linalool	5.16
22.851	2-Methylbutyl-2-methylbutyrate	0.05
22.990	Nonanal	0.07
23.695	Unidentified	0.10
25.518	Ipsdienol	0.12
25.777	Myrcenone	18.33
26.385	Unidentified	0.04
26.443	Unidentified	0.10
27.586	Borneol	0.08
28.209	Unidentified	0.08
29.186	alpha-Terpineol	1.22
29.994	Verbenone	0.04
31.620	(Z)-Ocimenone	1.07
32.146	(E)-Ocimenone	0.13
34.742	Myrcenone isomer	0.15
38.658	delta-Elemene	0.07
39.432	alpha-Cubebene	0.04
41.307	alpha-Copaene	0.72
41.826	beta-Bourbonene	0.22
42.095	beta-Cubebene	0.09
42.198	beta-Elemene	0.22
43.048	di-epi-alpha-Cedrene	0.12
43.892	alpha-Cedrene	0.33
44.116	trans-beta-Caryophyllene	15.23
44.519	Unidentified	0.25
44.727	gamma-Elemene	0.23
44.961	trans-alpha-Bergamotene	1.69
45.431	(Z)-beta-Farnesene	0.07
46.201	(E)-beta-Farnesene	0.04
46.351	alpha-Humulene	2.02
46.479	Unidentified	0.05
46.623	Alloaromadendrene	0.25
46.868	alpha-Acoradiene	0.08
47.560	trans-Cadina-1(6),4-diene	0.32
47.940	Germacrene D	3.81
48.123	(Z,E)-alpha-Farnesene	0.16

R.Time	Name	Area%
48.825	Bicyclogermacrene	0.32
49.020	alpha-Muurolene	0.10
49.592	beta-Bisabolene	0.30
49.699	beta-Curcumene	0.54
49.898	gamma-Cadinene	0.07
50.201	delta-Cadinene	0.33
50.718	(E)-gamma-Bisabolene	0.06
50.930	trans-calamenene	0.05
51.545	(E)-alpha-Bisabolene	0.04
52.603	Germacrene B	0.23
53.627	Unidentified	0.19
53.961	Caryophyllene oxide	0.56
57.669	delta-Cadinol	0.11
58.159	alpha-Cadinol	0.08
59.850	alpha-Bisabolol	0.19
73.413	Myrcene dimer I	0.48
74.062	Unidentified	0.05
75.053	Unidentified	1.31
78.489	Unidentified	0.08
80.238	Unidentified	0.20
80.678	Unidentified	0.67
81.208	Unidentified	1.05
82.140	Unidentified	2.48
82.459	Unidentified	0.09
82.609	Unidentified	0.26
83.360	Unidentified	0.26
84.549	Unidentified	2.30
85.500	Unidentified	0.09
86.274	Unidentified	1.48
86.966	Unidentified	0.07
87.684	Unidentified	0.50
88.054	Unidentified	2.08
89.817	Unidentified	0.23
90.384	Unidentified	0.53
91.603	Unidentified	0.07
93.607	Unidentified	3.92
95.216	Unidentified	1.63
95.673	Unidentified	0.07
		100.00

Sample Information

Analyzed by	**: Dr. Robert S. Pappas**
Analyzed	**: 10/27/2020 7:09:20 PM**
Sample Type	**: Essential Oil**
Sample Name	**: Vetiver -**
Sample ID	**BIOAROMA :**
Injection Volume	**BA29IAT**
Instrument ID:	**: 0.10**
	: GC-4

Chromatogram Vetiver - BIOAROMA



Comments:

The analysis of this Vetiver batch sample meets the expected chemical profile for authentic essential oil of *Vetiveria zizanioides*. No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Peak Report TIC

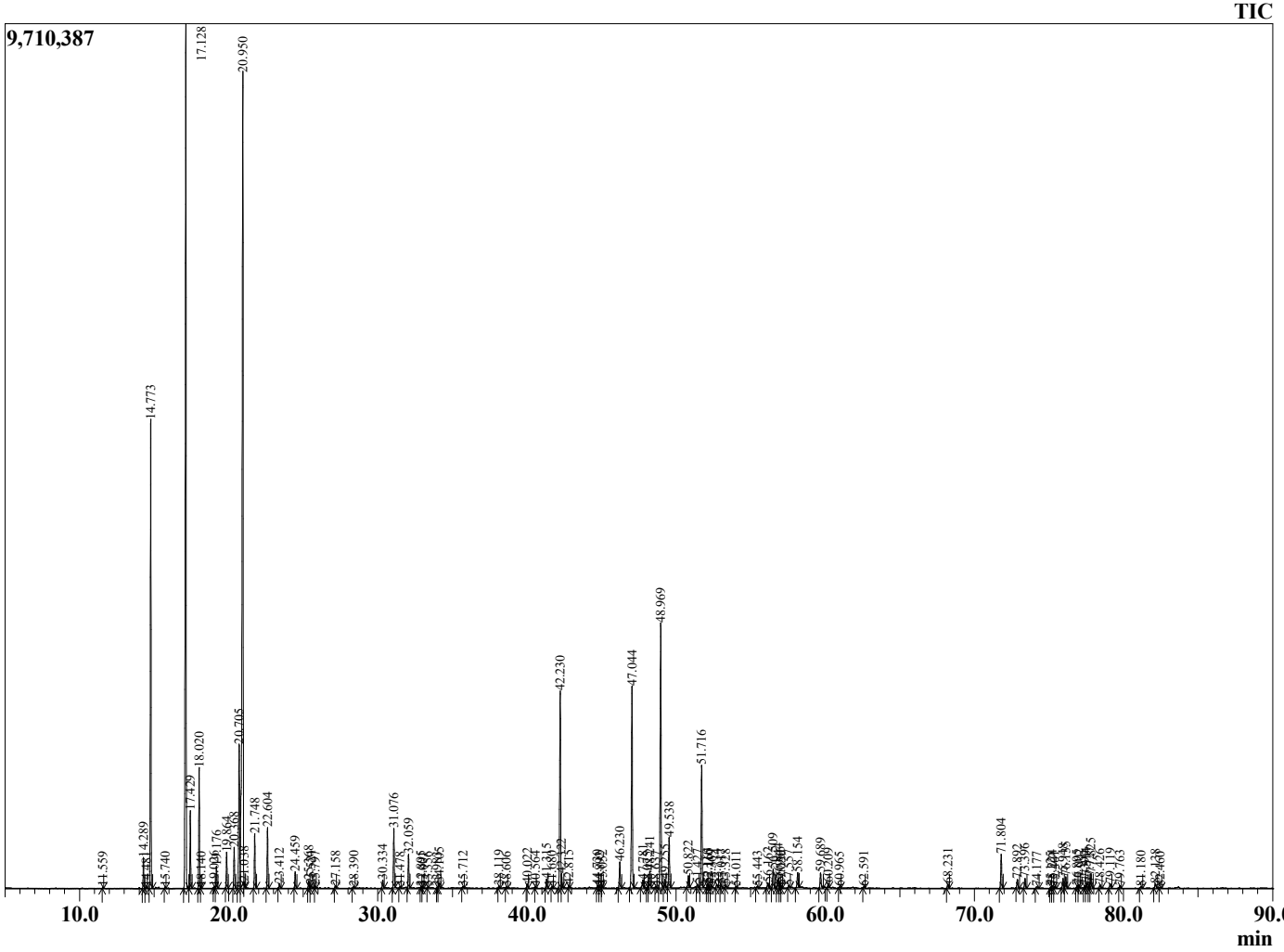
R.Time	Name	Area%
12.497	alpha-Pinene	0.07
41.031	alpha-Ylangene	0.32
41.869	alpha-Funebrene	0.05
43.679	alpha-Chamigrene	0.11
43.995	alpha-Cedrene	0.13
44.188	alpha-Gurjunene	0.13
44.969	Unidentified	0.15
45.626	6,9-Guaiadiene	0.17
46.252	Prezizaene	0.47
46.543	Khusimene	0.60
46.665	Unidentified	0.44
47.044	Unidentified	0.15
47.183	11,12,13-tri-nor-cis-Eudesm-5-en-7-one	0.18
47.417	(E)-Eremophila-1(10),7(11)-dien-12-yl acetat	0.25
47.980	alpha-Amorphene	1.92
48.105	Unidentified	0.06
48.224	Unidentified	0.09
48.460	delta-Selinene	0.90
48.580	beta-Vetispirene	1.07
48.799	trans-Murrola-4(14),5-diene	0.58
49.196	Unidentified	0.15
49.444	delta-Amorphene	1.18
49.553	Unidentified	0.33
50.075	Nootkatene	0.17
50.159	Unidentified	0.39
50.426	Unidentified	1.17
50.634	Zonarene	0.07
50.868	Unidentified	0.09
50.997	Unidentified	0.10
51.200	Unidentified	0.07
51.470	Selina-4(15),7(11)-diene	0.12
51.596	Unidentified	0.20
51.710	alpha-Calacorene	0.21
52.129	Elemol	0.69
52.453	beta-Vetivenene	2.67
52.995	Unidentified	2.47
53.539	Unidentified	0.04
53.653	13-nor-Eudesm-5-en-11-one	0.48
54.014	Unidentified	0.08
54.127	Unidentified	0.61
54.269	3,5,11-Eudesmatriene	1.07
54.784	Unidentified	0.36
55.455	Khusimone	0.62
55.653	Unidentified	0.19
55.998	Unidentified	0.63
56.150	Unidentified	0.20
56.375	Unidentified	2.81
56.497	Unidentified	3.31
56.785	Unidentified	0.99
56.997	gamma-Eudesmol	0.67
57.131	Unidentified	0.60
57.241	Unidentified	0.29
57.384	Unidentified	0.11
57.521	Unidentified	0.21
57.663	Unidentified	0.32
57.822	Unidentified	0.17
57.958	delta-Cadinol	0.44
58.256	alpha-Cadinol	4.05
58.416	Cyclocopacamphan-12-ol epimer A	2.10
58.599	Cyclocopacamphan-12-ol epimer B	1.55
58.849	Unidentified	1.19
59.117	Unidentified	1.35

R.Time	Name	Area%
59.241	Unidentified	0.66
59.518	2-epi-Ziza-6(13)-en-3-alpha-ol	1.26
59.664	Unidentified	0.20
59.908	Unidentified	0.13
60.146	Khusian-2-ol	1.83
60.467	Zizanal	0.33
60.686	Selin-7(11)-en-4-ol	1.81
60.814	2-epi-Ziza-6(13)-en-3-beta-ol	0.75
61.070	Unidentified	0.11
61.170	Unidentified	0.23
61.333	13-nor-Eudesma-4,6-dien-11-one	0.55
61.482	Unidentified	0.43
61.762	Isovetiselinenol	0.17
61.930	Unidentified	0.05
62.075	Vetiselinenol	4.25
62.398	Unidentified	1.15
62.596	Unidentified	0.40
62.960	Zizanol	3.64
63.289	Khusimol	12.39
63.528	Unidentified	0.32
63.771	Unidentified	0.07
63.929	Unidentified	0.07
64.195	Unidentified	0.13
64.278	Unidentified	0.31
64.462	Unidentified	0.25
64.600	Unidentified	0.17
64.984	Unidentified	0.07
65.374	trans-Isovalencenol	12.86
65.637	Unidentified	2.78
65.839	Unidentified	0.43
66.155	Unidentified	0.26
66.236	Unidentified	0.83
66.611	cis-Isovalencenal	0.26
66.728	beta-Vetivone	3.56
67.413	trans-Isovalencenal	0.79
68.053	alpha-Vetivone	4.00
71.130	Isovalencenyl formate	0.10
72.460	Unidentified	0.08
		100.00

Sample Information

Analyzed by	**: Dr. Robert S. Pappas**
Analyzed	**: 3/6/2021 12:09:39 PM**
Sample Type	**: Essential Oil**
Sample Name	**: Vitex -**
Sample ID	**BIOAROMA :**
Injection Volume	**BB22AAF**
Instrument ID:	**: 0.10**
	: GC-2

Chromatogram Vitex - BIOAROMA



Comments:

The analysis of this Vitex batch sample meets the expected chemical profile for authentic essential oil of *Vitex agnus castus.* No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Peak Report TIC

R.Time	Name	Area%
11.559	Isopentyl acetate	0.02
14.289	alpha-Thujene	0.56
14.481	Unidentified	0.03
14.773	alpha-Pinene	9.23
15.740	Camphene	0.03
17.128	Sabinene	20.74
17.429	beta-Pinene	1.47
18.020	Myrcene	2.35
18.140	Unidentified	0.02
19.026	Pseudolimonene	0.03
19.176	alpha-Phellandrene	0.44
19.864	alpha-Terpinene	0.72
20.368	para-Cymene	0.88
20.705	Limonene	3.76
20.950	1,8-Cineole	22.68
21.038	Unidentified	0.02
21.748	trans-beta-Ocimene	1.11
22.604	gamma-Terpinene	1.26
23.412	trans-Sabinene hydrate	0.10
24.459	Terpinolene	0.37
25.368	Linalool	0.18
25.521	cis-Sabinene hydrate	0.07
25.797	Isoamyl isovalerate	0.06
27.158	cis-para-Menth-2-en-1-ol	0.05
28.390	trans-para-Menth-2-en-1-ol	0.05
30.334	delta-Terpineol	0.18
31.076	Terpinen-4-ol	1.35
31.478	Cryptone	0.03
32.059	alpha-Terpineol	0.79
32.895	Isoamyl hexanoate	0.04
33.001	trans-Piperitol	0.04
33.356	Unidentified	0.02
33.983	Unidentified	0.03
34.105	Citronellol	0.13
35.712	3-Methylbutyl hexanoate	0.04
38.119	Bornyl acetate	0.06
38.606	trans-Ascridol glycol	0.03
40.022	beta-Terpinyl acetate	0.09
40.564	Unidentified	0.05
41.315	delta-Elemene	0.23
41.680	Unidentified	0.04
42.230	alpha-Terpinyl acetate	4.95
42.322	Citronellyl acetate	0.27
42.815	gamma-Terpinyl acetate	0.07
44.730	beta-Bourbonene	0.06
44.892	7-epi-Sesquithujene	0.04
45.052	beta-Elemene	0.06
46.230	alpha-Gurjunene	0.68
47.044	beta-Caryophyllene	5.28
47.781	trans-alpha-Bergamotene	0.26
48.075	Isoamyl benzoate	0.03
48.241	cis-beta-Farnesene	0.47
48.637	alpha-Guaiene	0.03
48.969	trans-beta-Farnesene	6.84
49.255	alpha-Humulene	0.21
49.538	Alloaromadendrene	1.27
50.822	Germacrene D	0.30
51.427	Viridiflorene	0.09
51.716	Bicyclogermacrene	3.17
52.110	(E,E)-alpha-Farnesene	0.09
52.165	Unidentified	0.09
52.369	beta-Bisabolene	0.08

R.Time	Name	Area%
52.734	Unidentified	0.10
53.017	delta-Cadinene	0.09
53.328	beta-Sesquiphellandrene	0.08
54.011	Unidentified	0.03
55.443	trans-Nerolidol	0.05
56.162	Palustrol	0.15
56.509	Spathulenol	0.50
56.844	Caryophyllene oxide	0.27
56.966	Unidentified	0.16
57.050	Globulol	0.04
57.557	Viridiflorol	0.06
58.154	Ledol	0.41
59.689	Unidentified	0.42
60.209	tau-Cadinol	0.10
60.965	alpha-Cadinol	0.03
62.591	alpha-Bisabolol	0.03
68.231	Unidentified	0.12
71.804	Unidentified	0.88
72.892	Cubitene	0.24
73.396	Unidentified	0.27
74.177	Isopimaradiene	0.07
75.125	Unidentified	0.03
75.224	Unidentified	0.07
75.401	Unidentified	0.05
75.948	Unidentified	0.26
76.135	Unidentified	0.31
76.895	Unidentified	0.07
77.002	Unidentified	0.09
77.399	Unidentified	0.05
77.514	Unidentified	0.14
77.727	Geranyl linalool isomer	0.13
77.825	Unidentified	0.42
78.426	Manool oxide	0.11
79.119	Unidentified	0.13
79.763	Unidentified	0.07
81.180	Abietatriene	0.05
82.138	Unidentified	0.13
82.460	Unidentified	0.03
		100.00

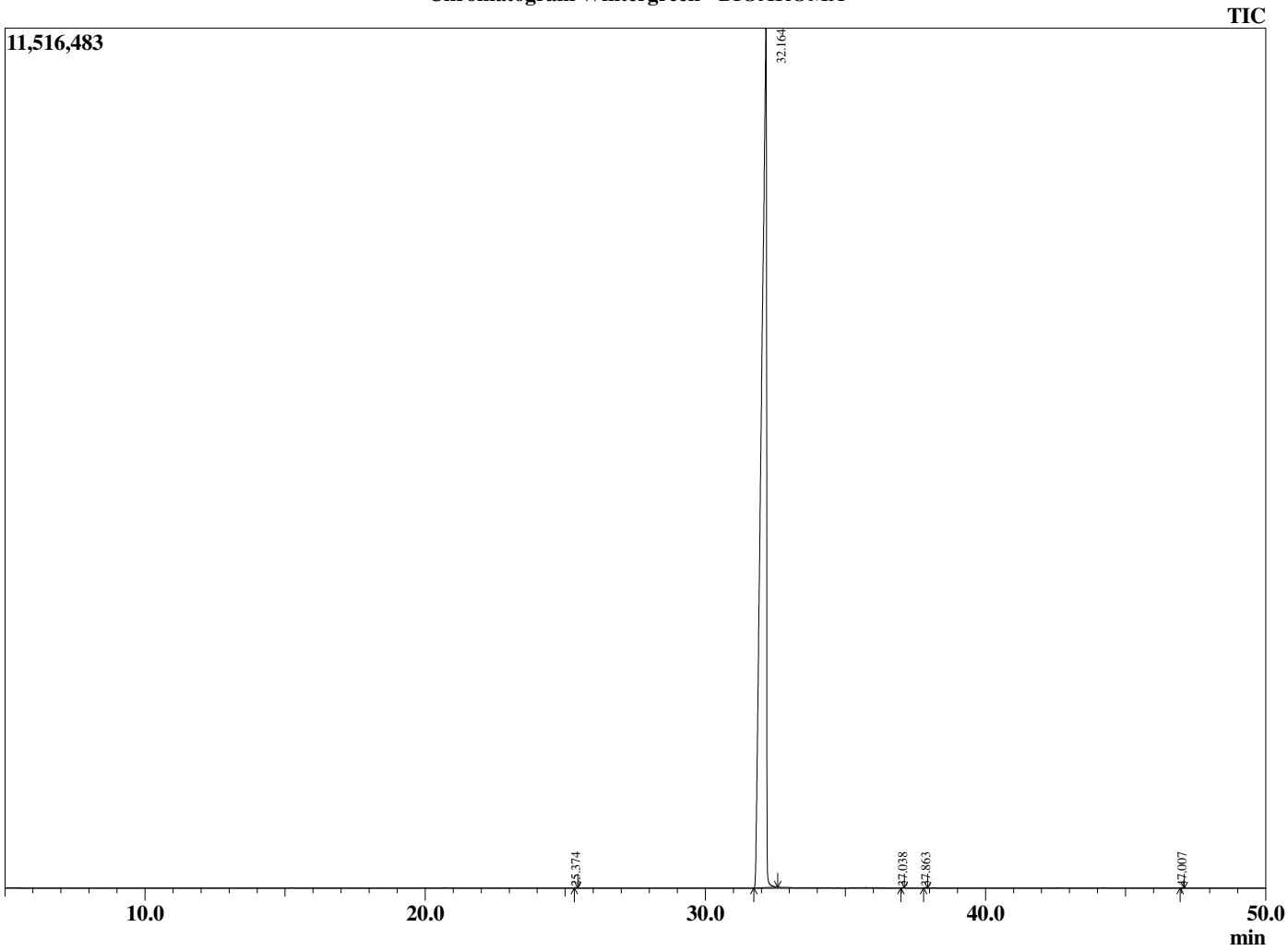
Sample Information

Analyzed by	**: Dr. Robert S. Pappas**
Analyzed	**: 3/7/2021 6:54:36 AM**
Sample Type	**: Essential Oil**
Sample Name	**: Wintergreen -**
Sample ID	**BIOAROMA : BB22AAG**
Injection Volume	**: 0.10**
Instrument ID:	**: GC-2**

Peak Report TIC

R.Time	Name	Area%
25.374	Linalool	0.02
32.164	Methyl salicylate	99.93
37.038	Ethyl salicylate	0.01
37.863	Unidentified	0.02
47.007	trans-beta-Caryophyllene	0.02
		100.00

Chromatogram Wintergreen - BIOAROMA



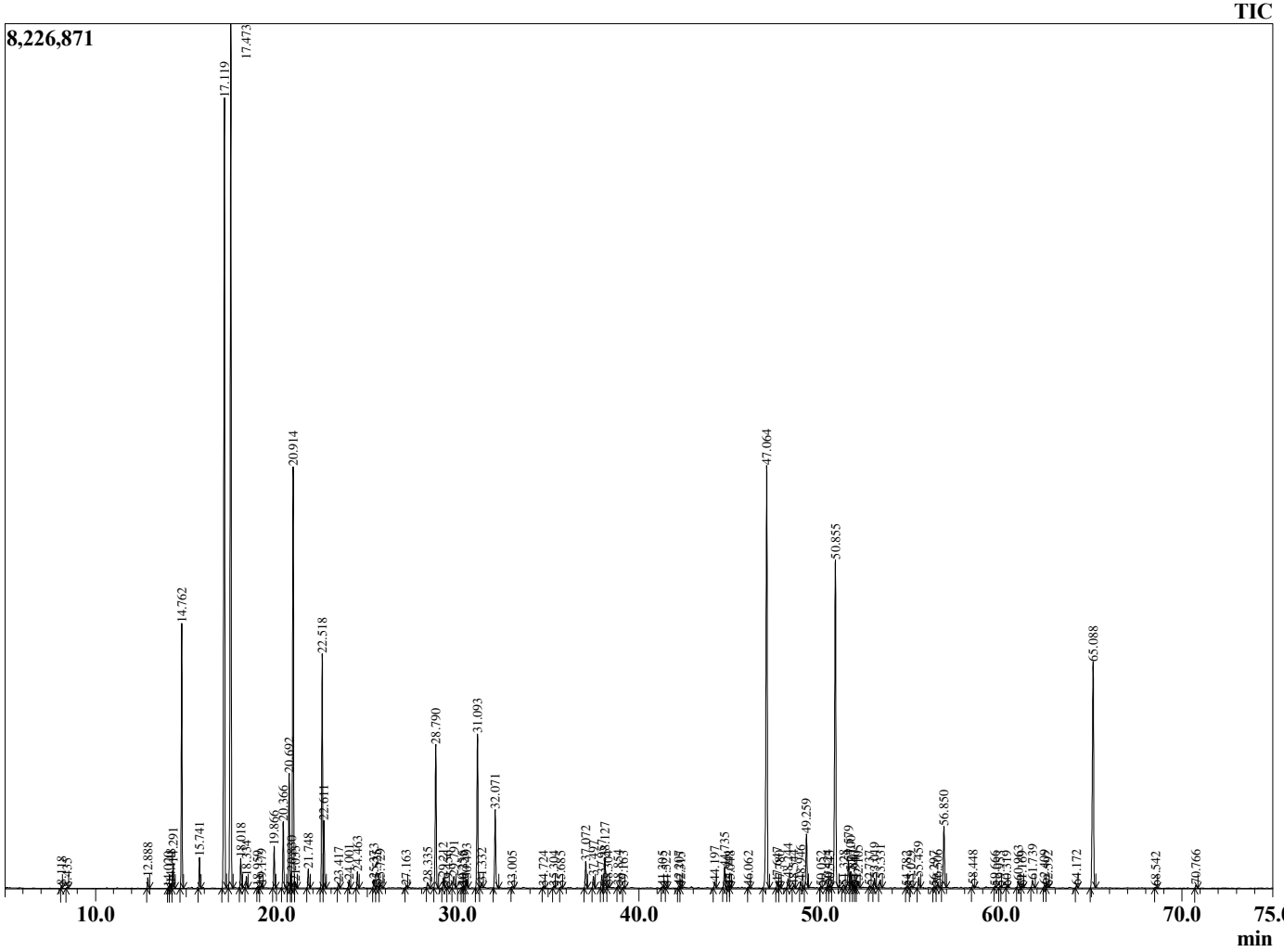
Comments:

The analysis of this Wintergreen batch sample meets the expected chemical profile for authentic essential oil of *Gaultheria procumbens*. No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Sample Information

Analyzed by	**: Dr. Robert S. Pappas**
Analyzed	**: 3/6/2021 4:06:44 PM**
Sample Type	**: Essential Oil**
Sample Name	**: Yarrow -**
Sample ID	**BIOAROMA :**
Injection Volume	**BB22AAH**
Instrument ID:	**: 0.10**
	: GC-2

Chromatogram Yarrow - BIOAROMA



Comments:

The analysis of this Blue Yarrow batch sample meets the expected chemical profile for authentic essential oil of *Achillea millefolium.* No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Peak Report TIC

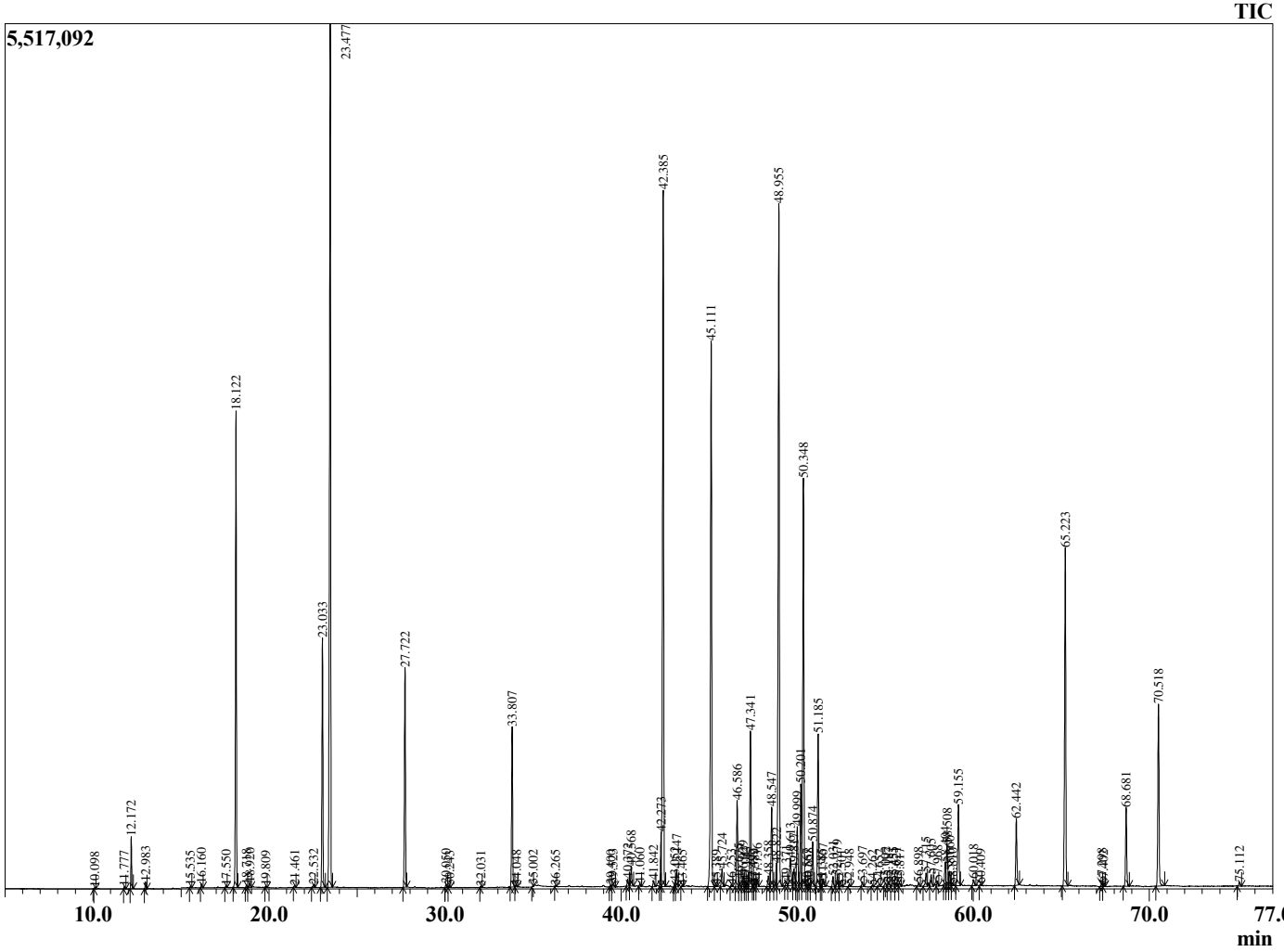
R.Time	Name	Area%
8.118	1-Octene	0.03
8.435	Hexanal	0.02
12.888	Santolinatriene	0.16
14.020	Unidentified	0.01
14.148	Tricyclene	0.07
14.291	alpha-Thujene	0.41
14.762	alpha-Pinene	4.22
15.741	Camphene	0.50
17.119	Sabinene	15.74
17.473	beta-Pinene	17.13
18.018	Myrcene	0.52
18.334	Yomogi alcohol	0.20
18.959	(Z)-3-Hexenyl acetate	0.03
19.179	alpha-Phellandrene	0.06
19.866	alpha-Terpinene	0.74
20.366	para-Cymene	1.23
20.692	Limonene	2.18
20.830	beta-Phelladrene	0.22
20.914	1,8-Cineole	7.94
21.033	(Z)-beta-Ocimene	0.11
21.748	(E)-beta-Ocimene	0.35
22.518	Artemisia ketone	4.40
22.611	gamma-Terpinene	1.23
23.417	trans-Sabinene hydrate	0.10
24.001	Artemisia alcohol	0.15
24.463	Terpinolene	0.31
25.373	Linalool	0.17
25.525	cis-Sabinene hydrate	0.06
25.729	Nonanal	0.08
27.163	cis-para-Menth-2-en-1-ol	0.05
28.335	trans-Pinocarveol	0.13
28.790	Camphor	2.91
29.212	trans-Chrysanthemol	0.20
29.456	Verbenol	0.03
29.791	Unidentified	0.32
30.255	Unidentified	0.03
30.339	delta-Terpineol	0.03
30.493	Borneol	0.17
31.093	Terpinen-4-ol	3.12
31.332	Myrcenone	0.10
32.071	alpha-Terpineol	1.65
33.005	cis-Piperitol	0.03
34.724	Unidentified	0.03
35.304	Cuminaldehyde	0.03
35.685	Linalyl acetate	0.02
37.072	4-Thujen-2-alpha-yl acetate	0.55
37.497	Unidentified	0.24
37.957	Lavandulyl acetate	0.26
38.127	Bornyl acetate	0.67
38.304	Unidentified	0.03
38.854	trans-Pinocarvyl acetate	0.04
39.163	Tridecane	0.02
41.305	Elemene isomer	0.03
41.522	delta-Elemene	0.02
42.207	alpha-Terpinyl acetate	0.04
42.315	alpha-Cubebene	0.02
44.197	alpha-Copaene	0.13
44.735	beta-Bourbonene	0.46
44.941	alpha-Bourbonene	0.05
45.048	beta-Elemene	0.02
46.062	cis-beta-Caryophyllene	0.03
47.064	trans-beta-Caryophyllene	10.31

R.Time	Name	Area%
47.647	beta-Copaene	0.11
47.780	trans-alpha-Bergamotene	0.04
48.244	(Z)-beta-Farnesene	0.21
48.544	Unidentified	0.06
48.946	(E)-beta-Farnesene	0.15
49.259	alpha-Humulene	1.20
50.052	10-beta-H-Cadina1(6),4-diene	0.03
50.424	trans-Cadina-1(6),4-diene	0.05
50.543	gamma-Curcumene	0.03
50.855	Germacrene D	8.05
51.328	Unidentified	0.08
51.579	alpha-Zingiberene	0.62
51.700	Bicyclogermacrene	0.35
51.847	alpha-Muurolene	0.06
51.940	Unidentified	0.03
52.105	(E,E)-alpha-Farnesene	0.15
52.737	gamma-Cadinene	0.04
53.019	delta-Cadinene	0.20
53.331	beta-Sesquiphellandrene	0.18
54.782	alpha-Elemol	0.02
55.029	Unidentified	0.04
55.459	Nerolidol	0.23
56.297	Unidentified	0.02
56.506	Spathulenol	0.07
56.850	Caryophyllene oxide	1.49
58.448	Humulene epoxide II	0.06
59.666	gamma-Eudesmol	0.02
59.953	Unidentified	0.04
60.319	alpha-Cadinol	0.03
60.963	alpha-Eudesmol	0.16
61.169	Unidentified	0.02
61.739	Unidentified	0.18
62.409	Unidentified	0.05
62.592	Unidentified	0.03
64.172	Pentadecanal	0.05
65.088	Chamazulene	5.61
68.542	Unidentified	0.02
70.766	Phytone	0.08
		100.00

Sample Information

Analyzed by : Dr. Robert S. Pappas
Analyzed : 10/30/2020 4:17:09 AM
Sample Type : Essential Oil
Sample Name : Ylang I -
Sample ID BIOAROMA : BA29AQ
Injection Volume : 0.10
Instrument ID: : GC-3

Chromatogram Ylang I - BIOAROMA



Comments:

The analysis of this Ylang Ylang I batch sample meets the expected chemical profile for authentic essential oil of *Cananga odorata.* No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Peak Report TIC

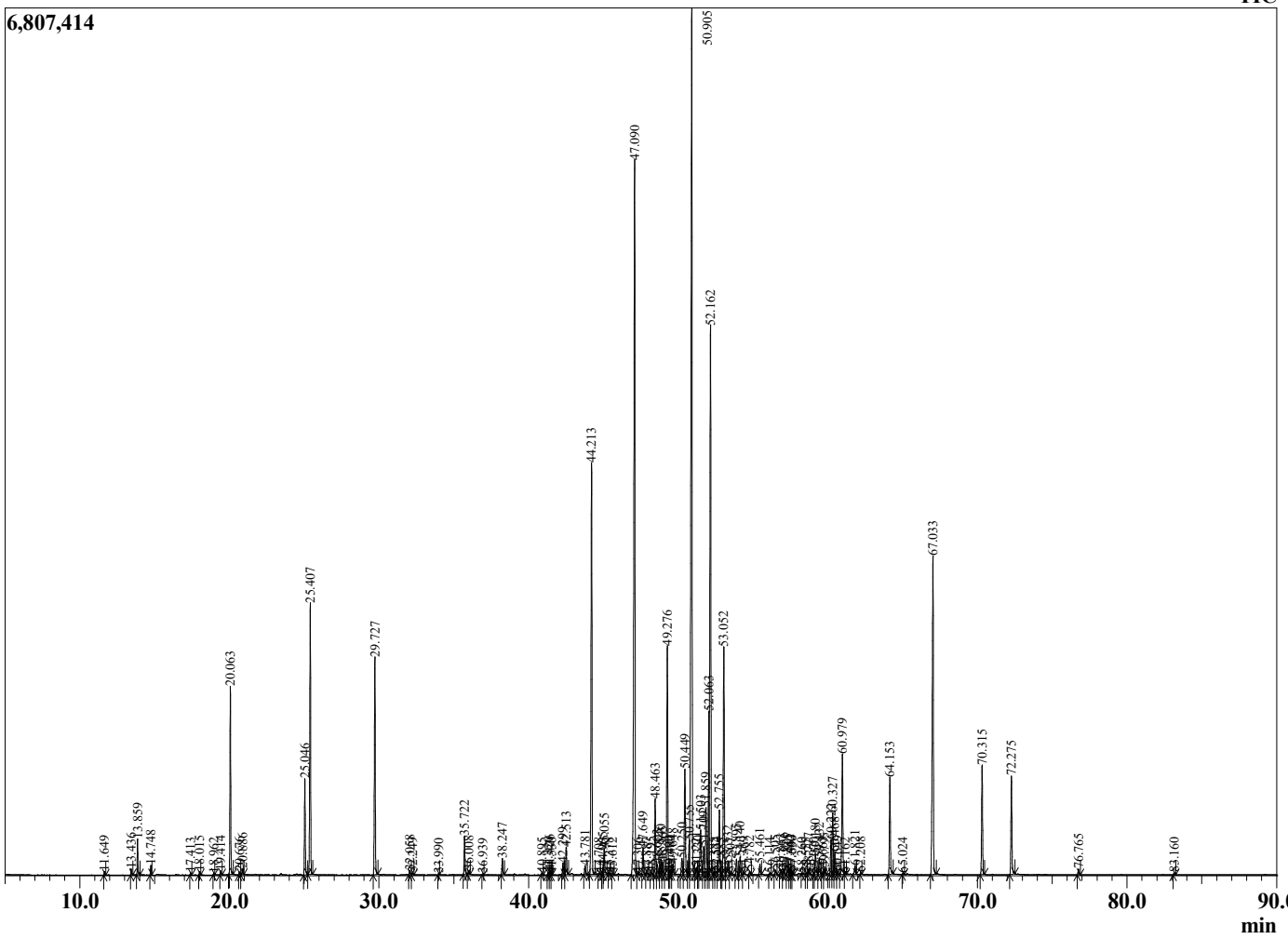
R.Time	Name	Area%
3.776	2-Methyl-3-hexanone	0.01
10.098	2-Methylbutyl acetate	0.01
11.777	Amyl acetate	0.03
12.172	Prenyl acetate	0.53
12.983	alpha-Pinene	0.08
15.535	beta-Pinene	0.02
16.160	Myrcene	0.05
17.550	Hexyl acetate	0.02
18.122	para-Methylanisole	6.08
18.718	Limonene	0.04
18.920	1,8-cineole	0.06
19.809	(E)-beta-Ocimene	0.02
21.461	cis-Linalool oxide (furanoid)	0.03
22.532	trans-Linalool oxide (furanoid)	0.05
23.033	Methyl benzoate	3.34
23.477	Linalool	13.97
27.722	Benzyl acetate	3.14
30.050	alpha-Terpineol	0.05
30.243	Methyl chavicol	0.02
32.031	Nerol	0.02
33.807	Geraniol	2.33
34.048	2-Phenethyl acetate	0.03
35.002	Geranial	0.02
36.265	Unidentified	0.02
39.400	Unidentified	0.03
39.523	Unidentified	0.06
40.372	alpha-Cubebene	0.12
40.568	Eugenol	0.31
41.060	Neryl acetate	0.03
41.842	alpha-Ylangene	0.11
42.273	alpha-Copaene	0.62
42.385	Geranyl acetate	11.39
43.052	beta-Cubebene	0.07
43.147	beta-Elemene	0.32
43.465	Unidentified	0.02
45.111	beta-Caryophyllene	9.31
45.389	Unidentified	0.02
45.724	beta-Copaene	0.28
46.253	Unidentified	0.02
46.586	(E)-Cinnamyl acetate	1.36
46.675	Unidentified	0.10
46.929	cis-Murrola-3,5-diene	0.17
47.047	trans-Murrola-3,5-diene	0.09
47.143	(E)-beta-Farnesene	0.06
47.341	alpha-Humulene	2.47
47.492	Unidentified	0.03
47.589	cis-Murrola-4(14),5-diene	0.04
47.736	cis-Cadina-1(6),4-diene	0.11
48.358	10-beta-H Cadina-1(6),4-diene	0.18
48.547	trans-Cadina-1(6),4-diene	1.28
48.822	alpha-Amorphene	0.29
48.955	Germacrene D	11.51
49.371	Prenyl benzoate	0.08
49.613	trans-Muurola-4(14),5-diene	0.64
49.817	Bicyclogermacrene	0.31
49.999	alpha-Muurolene	1.07
50.201	(Z,E)-alpha-Farnesene	1.66
50.348	(E,E)-alpha-Farnesene	6.74
50.567	Unidentified	0.02
50.658	Unidentified	0.04
50.874	gamma-Cadinene	0.71
51.185	delta-Cadinene	2.45

R.Time	Name	Area%
51.385	cis-Calamenene	0.02
51.467	Zonarene	0.14
52.031	trans-Cadina-1,4-diene	0.16
52.279	alpha-Cadinene	0.19
52.501	Unidentified	0.03
52.948	Elemol	0.03
53.697	trans-Nerolidol	0.07
54.262	Unidentified	0.03
54.652	Unidentified	0.05
55.002	10-epi-Junenol	0.07
55.187	Globulol	0.08
55.455	Unidentified	0.08
55.621	Unidentified	0.06
55.817	Guaiol	0.05
56.898	1,10-di-epi-Cubenol	0.06
57.315	Humulane-1,6-dien-3-ol	0.26
57.605	1-epi-Cubenol	0.21
57.968	Cubenol	0.09
58.404	tau-Cadinol	0.40
58.508	epi-alpha-Cadinol	0.74
58.660	delta-Cadinol	0.25
58.810	Unidentified	0.04
59.155	alpha-Cadinol	1.46
60.018	Striatol	0.11
60.409	Unidentified	0.03
62.442	(E,E)-Farnesol	1.06
65.223	Benzyl benzoate	5.67
67.298	Farnesyl acetate isomer	0.06
67.402	Unidentified	0.02
68.681	Farnesyl acetate	1.25
70.518	Benzyl salicylate	3.08
75.112	Geranyl benzoate	0.07
		100.00

Sample Information

Analyzed by	**: Dr. Robert S. Pappas**
Analyzed	**: 3/6/2021 2:08:07 PM**
Sample Type	**: Essential Oil**
Sample Name	**: Ylang Ylang Complete -**
Sample ID	**BIOAROMA : BB22AAI**
Injection Volume	**: 0.10**
Instrument ID:	**: GC-2**

Chromatogram Ylang Ylang Complete - BIOAROMA



Comments:

The analysis of this Ylang Ylang, Complete batch sample meets the expected chemical profile for authentic essential oil of *Cananga odorata.* No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.

Peak Report TIC

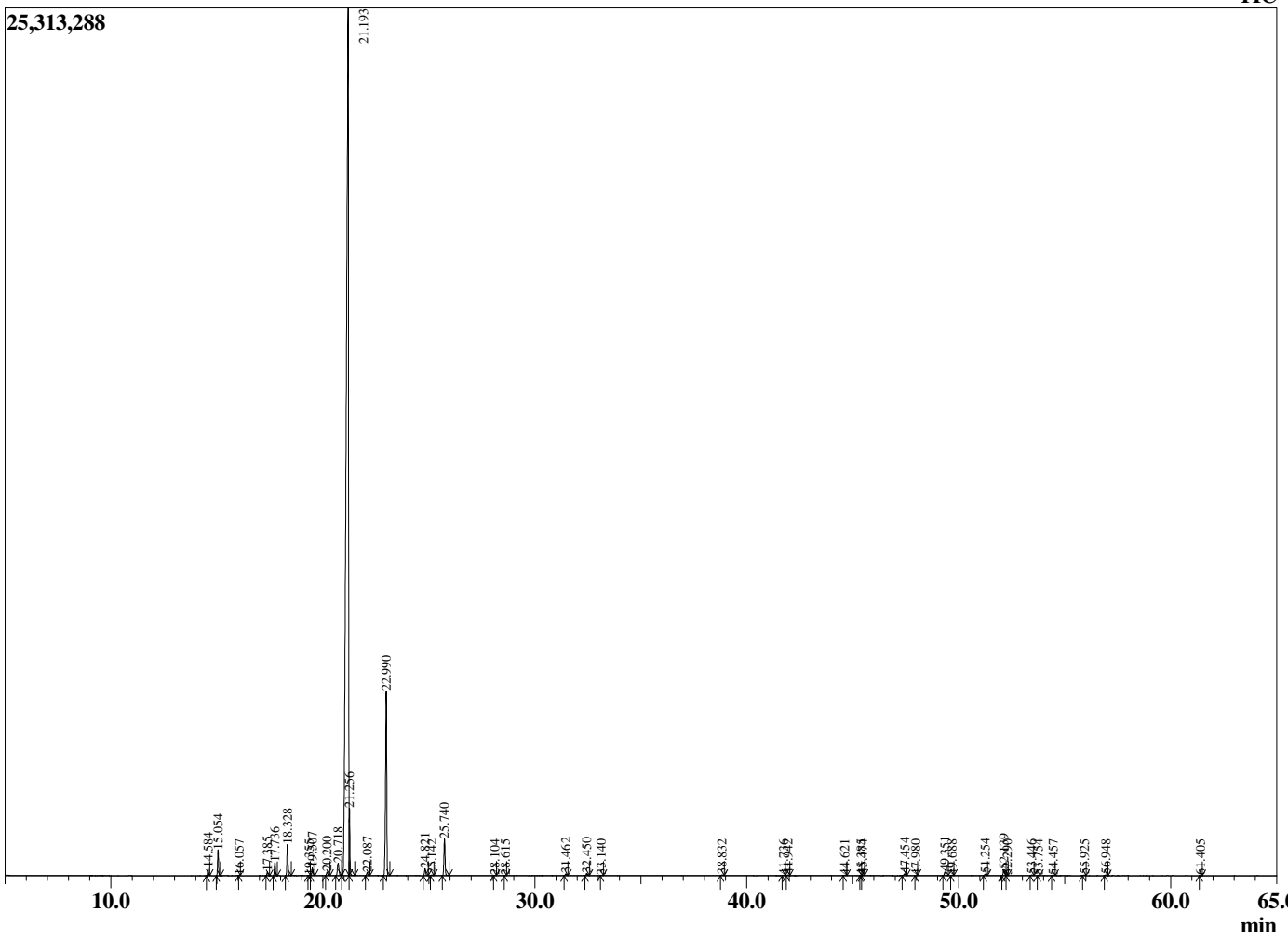
R.Time	Name	Area%
11.649	2-Methylbutyl acetate	0.04
13.436	Amyl acetate	0.07
13.859	Prenyl acetate	0.41
14.748	alpha-Pinene	0.11
17.413	beta-Pinene	0.03
18.015	Myrcene	0.04
18.962	Hex-3(Z)-enyl acetate	0.02
19.414	Hexyl acetate	0.05
20.063	para-Methylanisole	2.44
20.676	Limonene	0.04
20.886	1,8-Cineole	0.08
25.046	Methyl benzoate	1.35
25.407	Linalool	4.00
29.727	Benzyl acetate	3.27
32.058	alpha-Terpineol	0.06
32.249	Estragole	0.03
33.990	Nerol	0.01
35.722	Geraniol	0.59
36.008	2-Phenethyl acetate	0.05
36.939	Geranial	0.02
38.247	(E)-Anethole	0.26
40.895	Unidentified	0.03
41.320	Unidentified	0.05
41.426	Unidentified	0.07
41.530	delta-Elemene	0.02
42.299	alpha-Cubebene	0.18
42.513	Eugenol	0.43
43.781	alpha-Ylangene	0.15
44.213	Geranyl acetate	6.82
44.708	alpha-Copaene	0.02
44.965	beta-Cubebene	0.10
45.055	beta-Elemene	0.45
45.378	Unidentified	0.02
45.612	Methyleugenol	0.03
47.090	beta-Caryophyllene	13.74
47.306	Unidentified	0.03
47.649	beta-Copaene	0.43
47.887	Unidentified	0.04
48.195	Aromandendrene	0.03
48.463	(E)-Cinnamyl acetate	1.21
48.603	Unidentified	0.20
48.840	trans-Murrola-3,5-diene	0.26
48.965	trans-beta-Farnesene	0.22
49.276	alpha-Humulene	3.66
49.400	Unidentified	0.04
49.484	cis-Cadina-1(6),4-diene	0.06
49.648	cis-Muurola-4(14),5-diene	0.19
50.250	10-beta-H-Cadina-1(6),4-diene	0.28
50.449	trans-Cadina-1(6),4-diene	1.95
50.755	alpha-Amorphene	0.47
50.905	Germacrene D	17.39
51.221	Prenyl benzoate	0.15
51.330	Unidentified	0.04
51.503	trans-Muurola-4(14),5-diene	0.95
51.709	Bicyclogermacrene	0.49
51.859	alpha-Muurolene	1.18
52.063	(Z,E)-alpha-Farnesene	2.25
52.162	(E,E)-alpha-Farnesene	9.87
52.385	beta-Bisabolene	0.05
52.534	Unidentified	0.08
52.755	gamma-Cadinene	1.09
52.885	Cubebol	0.02

R.Time	Name	Area%
53.052	delta-Cadinene	3.81
53.332	Zonarene	0.28
53.507	trans-gamma-Bisabolene	0.04
53.895	alpha-Cadine-1,4-diene	0.24
54.140	alpha-Cadinene	0.29
54.369	Unidentified	0.03
54.782	Elemol	0.06
55.461	trans-Nerolidol	0.16
56.114	Hex-(3Z)-enyl benzoate	0.02
56.505	Unidentified	0.08
56.863	10-epi-Junenol	0.10
57.056	Unidentified	0.10
57.315	Unidentified	0.10
57.462	Unidentified	0.08
57.560	Unidentified	0.06
57.630	Guaiol	0.05
58.260	Rosifoliol	0.02
58.555	Unidentified	0.03
58.727	Unidentified	0.09
59.070	Unidentified	0.02
59.180	Humulane-1,6-dien-3-ol	0.38
59.432	1-epi-Cubenol	0.30
59.663	gamma-Eudesmol	0.04
59.795	Unidentified	0.11
60.222	tau-Cadinol	0.59
60.327	epi-alpha-Cadinol	1.09
60.468	delta-Cadinol	0.37
60.649	alpha-Cadinol isomer	0.06
60.979	alpha-Cadinol	2.20
61.162	Unidentified	0.02
61.821	Striatol	0.17
62.208	Unidentified	0.03
64.153	(2E,6E)-Farnesol	1.58
65.024	Unidentified	0.02
67.033	Benzyl benzoate	6.10
70.315	Farnesyl acetate	1.78
72.275	Benzyl salicylate	1.65
76.765	Geranyl benzoate	0.10
83.160	Benzyl cinnamate	0.03
		100.00

Sample Information

Analyzed by : Dr. Robert S. Pappas
Analyzed : 7/12/2020 7:39:22 AM
Sample Type : Essential Oil
Sample Name : Yuzu - BIOAROMA :
Sample ID BA18FBB
Injection Volume : 0.10
Instrument ID: : GC-2

Chromatogram Yuzu - BIOAROMA



Peak Report TIC

R.Time	Name	Area%
14.584	alpha-Thujene	0.29
15.054	alpha-Pinene	1.02
16.057	Camphene	0.00
17.385	Sabinene	0.16
17.736	beta-Pinene	0.56
18.328	Myrcene	1.35
19.355	Pseudolimonene	0.01
19.507	alpha-Phellandrene	0.35
20.200	alpha-Terpinene	0.18
20.718	para-Cymene	0.77
21.193	Limonene	80.88
21.256	beta-Phellandrene	1.84
22.087	trans-beta-Ocimene	0.14
22.990	gamma-Terpinene	9.03
24.821	Terpinolene	0.34
25.142	para-Cymenene	0.03
25.740	Linalool	1.74
28.104	cis-Limonene oxide	0.01
28.615	Unidentified	0.01
31.462	Terpinen-4-ol	0.09
32.450	alpha-Terpineol	0.12
33.140	Decanal	0.01
38.832	Thymol	0.04
41.736	cis-delta-Elemene	0.02
41.942	trans-delta-Elemene	0.03
44.621	alpha-Copaene	0.02
45.385	beta-Cubebene	0.01
45.474	beta-Elemene	0.03
47.454	beta-Caryophyllene	0.11
47.980	gamma-Elemene	0.01
49.351	trans-beta-Farnesene	0.20
49.688	alpha-Humulene	0.02
51.254	Germacrene D	0.08
52.139	Bicyclogermacrene	0.32
52.290	alpha-Muurolene	0.01
53.446	delta-Cadinene	0.04
53.754	beta-Sesquiphellandrene	0.01
54.457	(Z)-9-Dodecen-12-olide (Yuzu Lactone)	0.03
55.925	Germacrene B	0.04
56.948	Spathulenol	0.05
61.405	alpha-Cadinol	0.01
		100.00

Comments:

The analysis of this Yuzu, Distilled batch sample meets the expected chemical profile for authentic essential oil of *Citrus junos*. No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.