



*Essential Validation Services*



### Sample:

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Client: | Nature's Fusions  
Sample: | Blue Tansy (Tanacetum annuum)  
Batch # | BT1  
CAS Number | 8002-66-2  
Type: | Essential Oil

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### Conclusion:

- No adulterants, diluents, or contaminants were detected via this method.



X



Validated By:

Essential Validation Services

747 SW 2nd Ave, Gainesville, FL 32601

Phone: 317-361-5044 E-mail: [Adam@essentialvalidationservices.com](mailto:Adam@essentialvalidationservices.com)

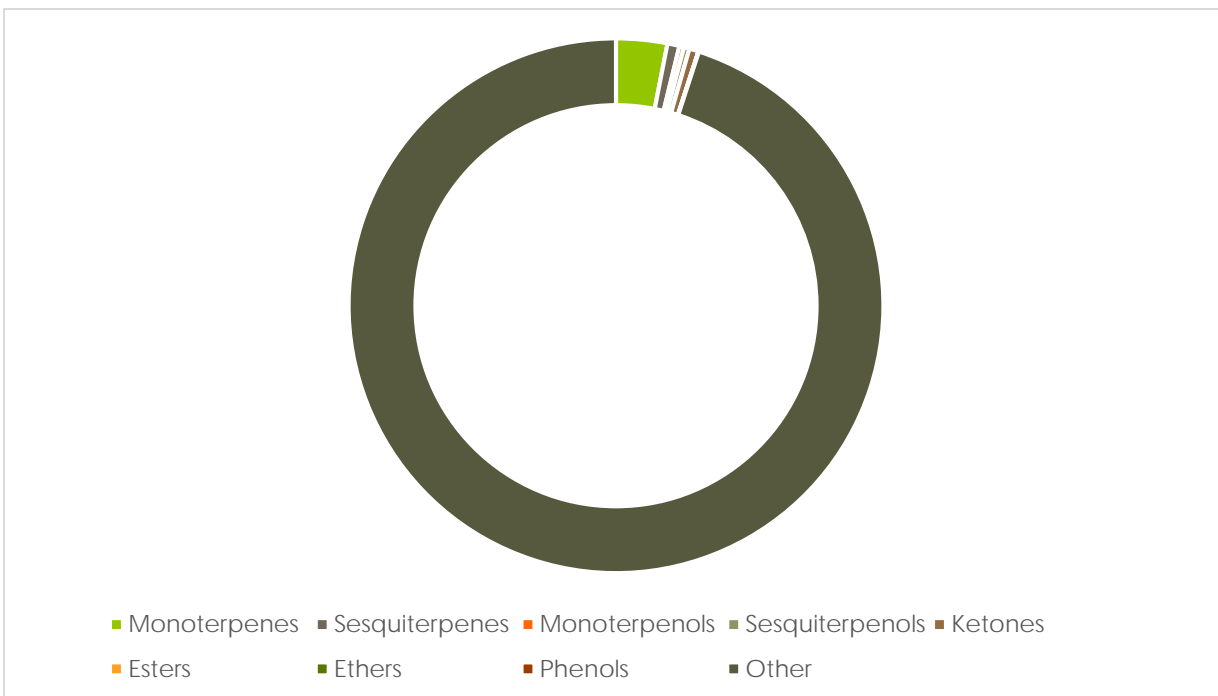
### Summary of Analyses

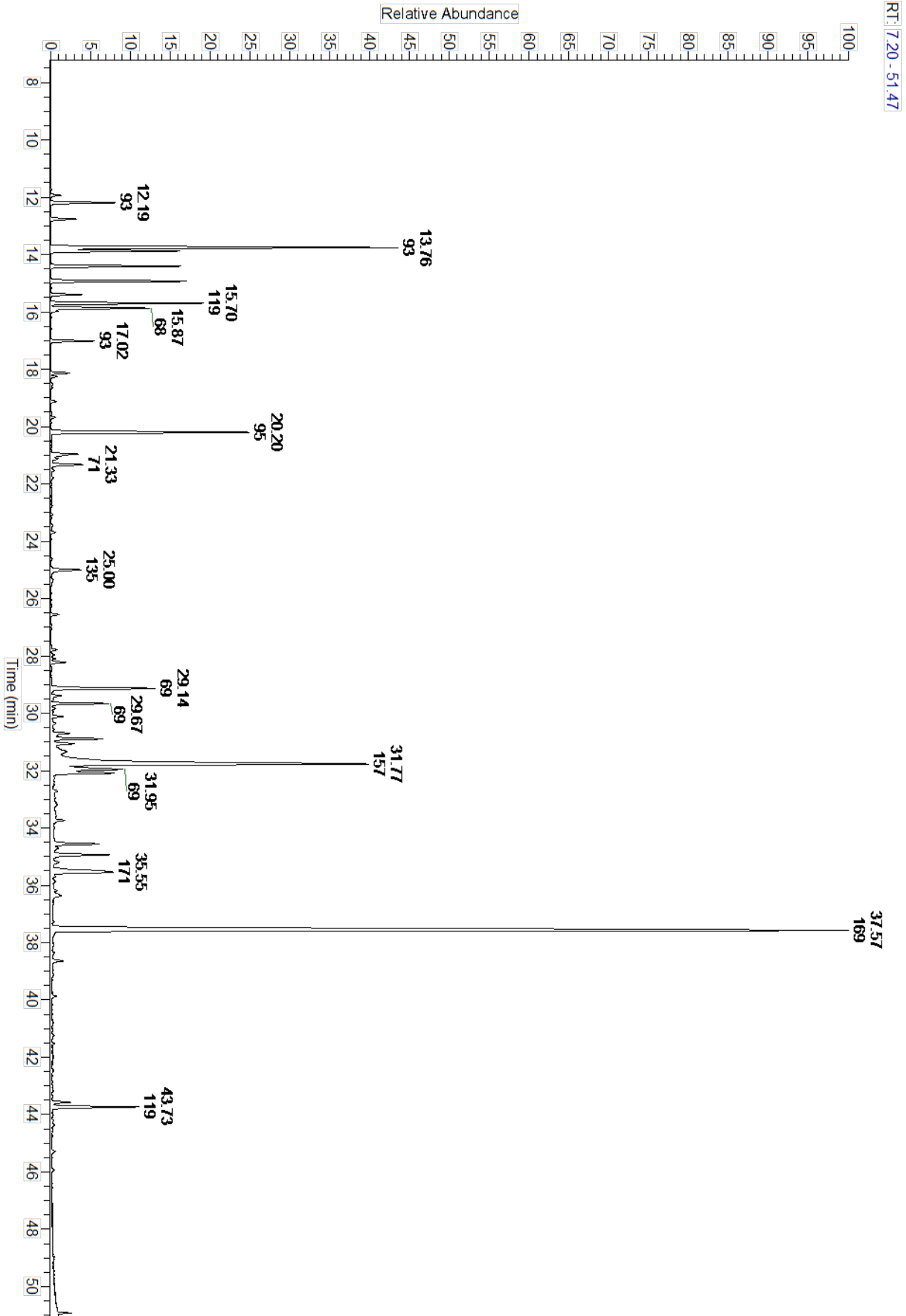
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A fresh sample of Blue Tansy (Tanacetum annuum) Essential Oil (10 uL in .5to.5 mL Hexane + ETOH) was prepared and analyzed via split injection GC/EI-MS.

Main Compounds	Percentages
Chamazulene	27.87%
3,6-Dihydrochamazulene	12.94%
Sabinene	8.74%
Camphor	5.01%
para-Cymene	3.45%
alpha-Phellandrene	3.15%
beta-Pinene	3.14%
Myrcene	2.93%
beta-Eudesmol	2.76%
beta-Caryophyllene	2.62%
UK Tansey	2.32%
Limonene	2.24%
alpha-Pinene	1.52%

Monoterpenes	Sesquiterpenes	Monoterpenols	Sesquiterpenols	Ketones
28.04%	6.60%	2.55%	3.02%	5.11%
Esters	Ethers	Aldehydes	Phenols	Other
0.07%	0.13%	0.06%	0.08%	54.34%







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Peak Number	RT	Area %	Compound Name	RI	Chemical Family
1	11.74	0.02%	Tricyclene	923.20	Monoterpene
2	11.94	0.21%	alpha-Thujene	927.80	Monoterpene
3	12.19	1.52%	alpha-Pinene	936.10	Monoterpene
4	12.76	0.60%	Camphene	950.30	Monoterpene
5	13.76	8.74%	Sabinene	973.00	Monoterpene
6	13.87	3.14%	beta-Pinene	977.70	Monoterpene
7	14.41	2.93%	Myrcene	989.20	Monoterpene
8	14.93	3.15%	alpha-Phellandrene	1004.10	Monoterpene
9	15.40	0.67%	alpha-Terpinene	1017.10	Monoterpene
10	15.70	3.45%	para-Cymene	1024.30	Monoterpene
11	15.87	2.24%	Limonene	1029.50	Monoterpene
12	15.87	Co-Eluting	beta-Phellandrene	1030.00	Monoterpene
13	15.97	0.13%	1,8-Cineole	1031.80	Monoterpene Ether
14	17.02	0.95%	gamma-Terpinene	1063.71	Monoterpene
15	18.14	0.42%	Terpinolene	1092.10	Monoterpene
16	18.51	0.05%	Linalool	1099.00	Monoterpenol
17	18.65	0.04%	2-Methylbutyl 2-methylbutyrate	1102.10	Aliphatic Ester
18	19.68	0.08%	Limona ketone	1134.50	Simple Phenolic
19	20.20	5.01%	Camphor	1147.55	Monoterpene Ketone
20	20.96	0.78%	Borneol	1168.71	Monoterpenol
21	21.33	0.79%	Terpinen-4-ol	1180.57	Monoterpenol
22	21.79	0.05%	alpha-Terpineol	1191.71	Monoterpenol
23	22.01	0.01%	Myrtenal	1200.43	Monoterpene Aldehyde
24	23.06	0.03%	(Z)-Hex-3-en-1-ylisovalerate	1231.50	Aliphatic Ester
25	23.44	0.05%	Cuminal	1243.00	Monoterpene Aldehyde
26	23.69	0.10%	Carvotanacetone	1245.50	Monoterpene Ketone
27	25.00	0.84%	Thymol	1288.15	Monoterpenol
28	25.34	0.04%	Carvacrol	1304.40	Monoterpenol
29	26.56	0.18%	delta-Elemene	1335.83	Sesquiterpene
30	27.79	0.13%	alpha-Copaene	1379.00	Sesquiterpene
31	28.22	0.32%	beta-Elemene	1389.20	Sesquiterpene
32	29.14	2.62%	beta-Caryophyllene	1427.14	Sesquiterpene
33	29.67	1.20%	beta-Copaene	1445.00	Sesquiterpene
34	30.12	0.24%	alpha-Humulene	1461.43	Sesquiterpene
35	30.89	1.15%	Germacrene D	1484.71	Sesquiterpene
36	31.06	0.46%	beta-Selinene	1487.57	Sesquiterpene
37	31.32	0.30%	Bicyclogermacrene	1490.71	Sesquiterpene
38	31.77	12.94%	3,6-Dihydrochamazulene	1530.00	Azulene
39	31.95	2.32%	UK Tansey		
40	33.18	0.15%	4,10-Dihydrochamazulene	1607.50	Azulene
41	33.59	0.10%	gamma-Eudesmol	1608.00	Sesquiterpenol
42	33.74	0.31%	7,12-Dehydro-5,6,7,8-tetrahydro	1619.95	Azulene



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43	34.56	1.21%	5,6-Dihydrochamazulene	1620.50	Azulene
44	34.94	1.46%	UK Chamazulene		
45	35.19	0.16%	Hinesol	1637.50	Sesquiterpenol
46	35.55	2.76%	beta-Eudesmol	1647.86	Sesquiterpenol
47	37.57	27.87%	Chamazulene	1717.50	Azulene





## *Essential Validation Services*





**Sample:**

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Client: | Nature's Fusions  
Sample: | Blue Tansy (Tanacetum annuum)  
Batch # | 436.B  
CAS Number | 8002-66-2  
Type: | Essential Oil

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**Conclusion:**

- No adulterants, diluents, or contaminants were detected via this method.



X *Adam Christen*

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Validated By:

Essential Validation Services

747 SW 2nd Ave, Gainesville, FL 32601

Phone: 317-361-5044 E-mail: Adam@essentialvalidationservices.com

**Summary of Analyses**

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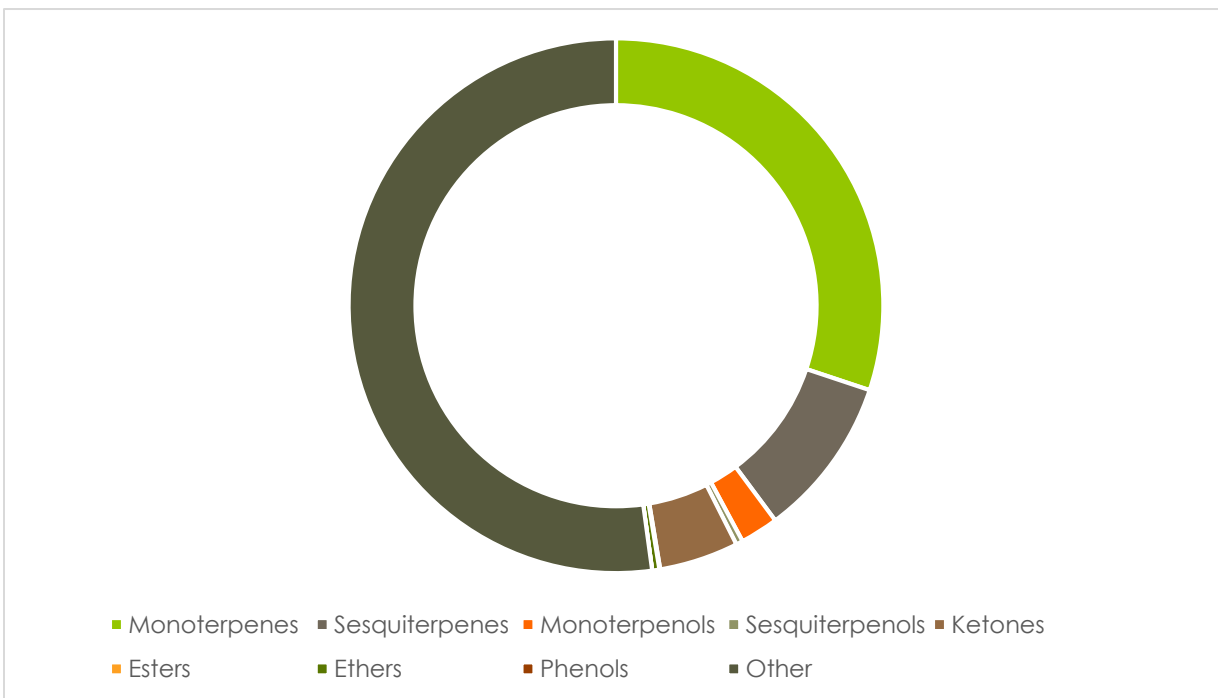
A fresh sample of Blue Tansy (Tanacetum annuum) Essential Oil (10 uL in .5to.5 mL Hexane + ETOH) was prepared and analyzed via split injection GC/EI-MS.



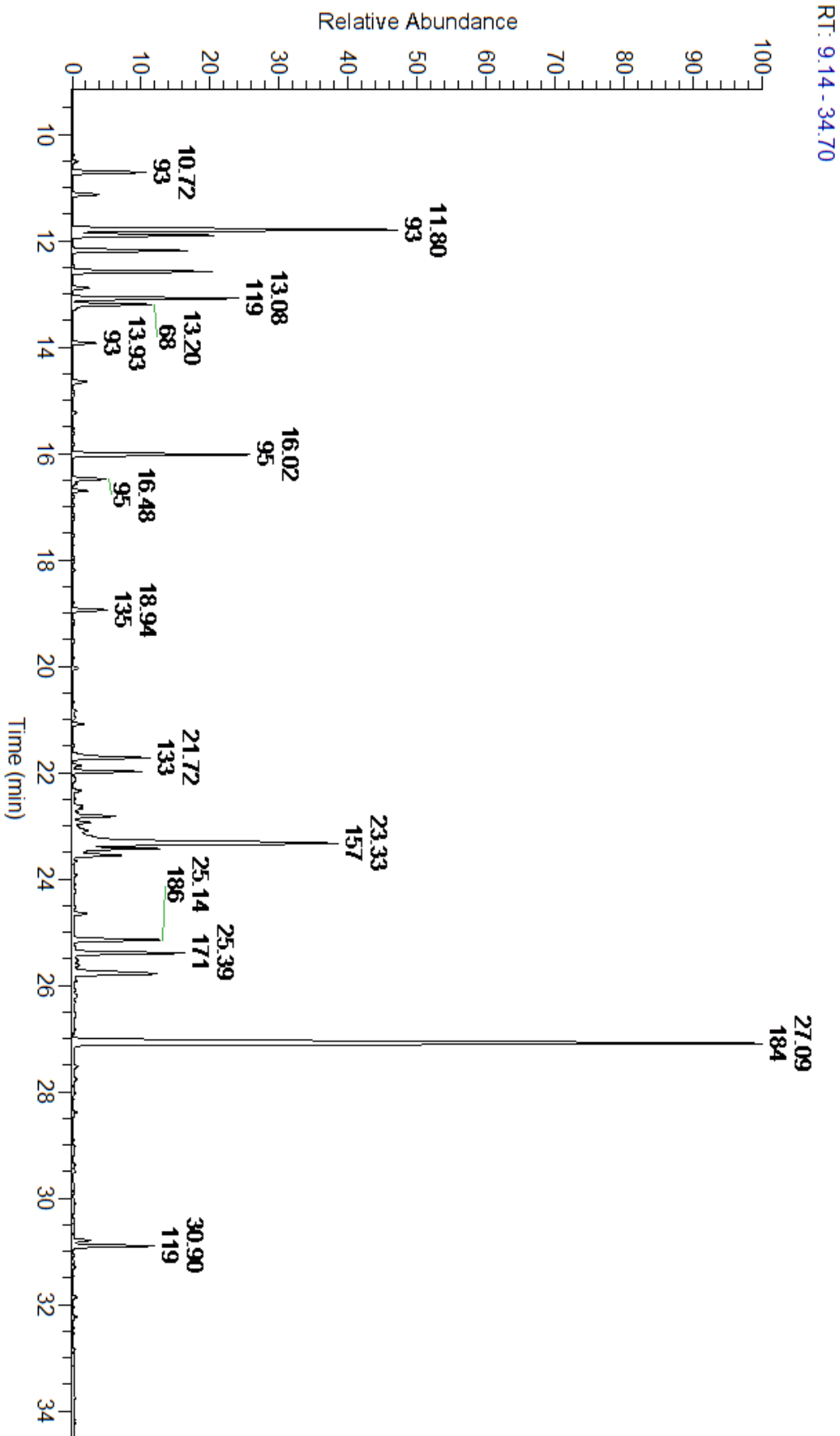


Main Compounds	Percentages
Chamazulene	26.06%
Sabinene	9.59%
Camphor	4.70%
para-Cymene	4.00%
beta-Pinene	3.76%
alpha-Phellandrene	3.43%
Myrcene	2.82%
gamma-Cadinene	2.33%
beta-Caryophyllene	2.19%
Limonene	2.09%
alpha-Pinene	1.92%
beta-Copaene	1.57%
3,6-Dihydrochamazulene	1.30%

Monoterpenes	Sesquiterpenes	Monoterpenols	Sesquiterpenols	Ketones
29.87%	9.65%	2.29%	0.41%	4.75%
Esters	Ethers	Aldehydes	Phenols	Other
0.05%	0.43%	0.00%	0.06%	51.74%



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Total Percentage	99.29%				
Peak Number	RT	Area %	Compound Name	RI	Chemical Family
1	10.51	0.13%	alpha-Thujene	927.80	Monoterpene
2	10.72	1.92%	alpha-Pinene	936.10	Monoterpene
3	11.13	0.72%	Camphene	950.30	Monoterpene
4	11.80	9.59%	Sabinene	973.00	Monoterpene
5	11.90	3.76%	beta-Pinene	977.70	Monoterpene
6	12.18	2.82%	Myrcene	989.20	Monoterpene
7	12.47	0.06%	3-Octanol	993.20	Aliphatic Alcohol
8	12.58	3.43%	alpha-Phellandrene	1004.10	Monoterpene
9	12.89	0.42%	alpha-Terpinene	1017.10	Monoterpene
10	13.08	4.00%	para-Cymene	1024.30	Monoterpene
11	13.20	2.09%	Limonene	1029.50	Monoterpene
12	13.20	Co-Eluting	beta-Phellandrene	1030.00	Monoterpene
13	13.28	0.10%	1,8-Cineole	1031.80	Monoterpene Ether
14	13.93	0.56%	gamma-Terpinene	1063.71	Monoterpene
15	14.65	0.43%	Terpinolene	1092.10	Monoterpene
16	14.91	0.05%	2-Methylbutyl 2-methylbutyrate	1102.10	Aliphatic Ester
17	15.62	0.06%	Limona ketone	1134.50	Simple Phenolic
18	16.02	4.70%	Camphor	1153.86	Monoterpene Ketone
19	16.48	0.90%	Borneol	1168.71	Monoterpenol
20	16.57	0.09%	UK	#N/A	#N/A
21	16.70	0.37%	Terpinen-4-ol	1180.57	Monoterpenol
22	16.81	0.06%	para-Cymen-8-ol	1186.43	Monoterpenol
23	16.97	0.04%	alpha-Terpineol	1191.71	Monoterpenol
24	18.20	0.05%	Carvotanacetone	1245.50	Monoterpene Ketone
25	18.94	0.88%	Thymol	1294.57	Monoterpenol
26	19.15	0.04%	Carvacrol	1304.40	Monoterpenol
27	20.04	0.14%	delta-Elemene	1335.83	Sesquiterpene
28	20.83	0.09%	alpha-Copaene	1379.00	Sesquiterpene
29	21.09	0.27%	beta-Elemene	1388.30	Sesquiterpene
30	21.72	2.19%	beta-Caryophyllene	1427.14	Sesquiterpene
31	21.87	0.22%	beta-Gurjunene	1437.71	Sesquiterpene
32	21.98	1.57%	beta-Copaene	1445.00	Sesquiterpene
33	22.11	0.06%	(Z)-beta-Farnesene	1453.40	Sesquiterpene
34	22.15	0.06%	UK Sesquiterpene	#N/A	#N/A
35	22.34	0.23%	alpha-Humulene	1461.43	Sesquiterpene
36	22.48	0.05%	UK Sesquiterpene	#N/A	#N/A
37	22.63	0.21%	gamma-Curcumene	1476.00	Sesquiterpene
38	22.82	1.14%	Germacrene D	1484.71	Sesquiterpene
39	22.94	0.52%	beta-Selinene	1487.57	Sesquiterpene
40	23.09	0.68%	alpha-Muurolene	1501.14	Sesquiterpene
41	23.33	12.10%	1,9-Dihydrochamazulene	1515.00	Azulene
42	23.43	2.33%	gamma-Cadinene	1515.29	Sesquiterpene

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43	23.56	1.30%	3,6-Dihydrochamazulene	1530.00	Azulene	
44	23.66	0.07%	Dihydrochamazulene A	1532.10	Azulene	
45	23.93	0.07%	Elemol	1548.57	Sesquiterpenol	
46	24.10	0.04%	Dihydrochamazulene B	1560.50		0.00
47	24.52	0.03%	Spathulenol	1587.00	Sesquiterpenol	
48	24.66	0.33%	Caryophyllene oxide	1594.86	Sesquiterpene Ether	
49	25.14	2.20%	4,10-Dihydrochamazulene	1599.75	Azulene	
50	25.39	2.81%	5,6-Dihydrochamazulene	1620.50	Azulene	
51	25.53	0.17%	Ledol	1623.00	Sesquiterpenol	
52	25.62	0.15%	UK	#N/A		#N/A
53	25.78	3.27%	7,8-Dihydrochamazulene	1654.50	Azulene	
54	25.91	0.07%	trans-Calamenen-10-ol	1658.00	Sesquiterpenol	
55	26.20	0.13%	UK	#N/A		#N/A
56	26.56	0.07%	epi- $\alpha$ -Bisabolol	1684.86	Sesquiterpenol	
57	27.09	26.06%	Chamazulene	1717.50	Azulene	
58	27.77	0.12%	UK	#N/A		#N/A
59	30.80	0.46%	UK	#N/A		#N/A
60	30.90	2.05%	geranyl- $\alpha$ -terpinene	#N/A		#N/A
61	34.93	0.15%	UK	#N/A		#N/A
62	35.37	0.61%	UK	#N/A		#N/A