

Sample Information

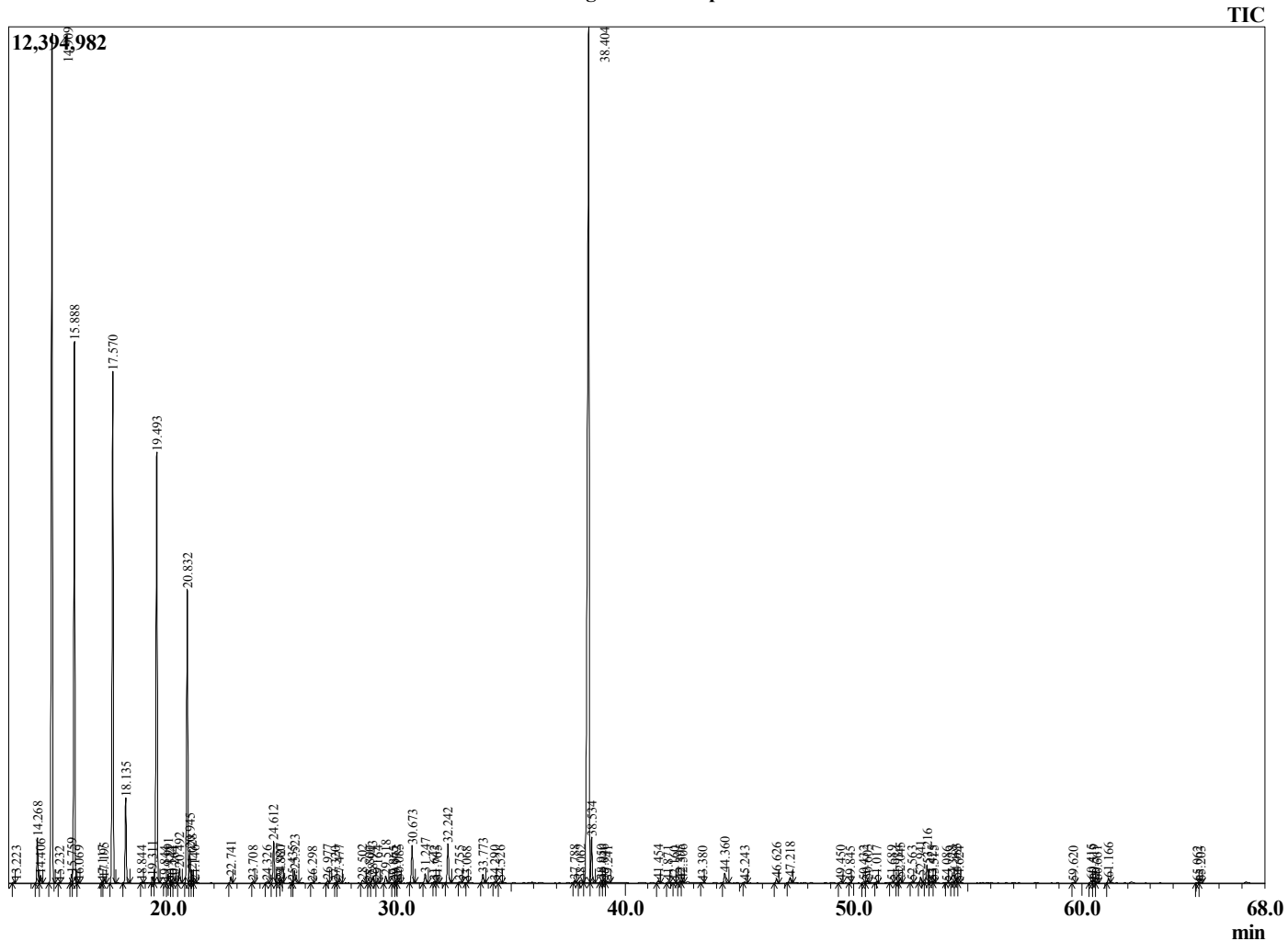
Analyzed by : Dr. Robert S. Pappas
 Analyzed : 11/18/2020 4:42:09 AM
 Sample Type : Essential Oil
 Sample Name : Black Spruce - Barefut
 Sample ID : 0107
 Injection Volume : 0.10
 Instrument ID: : GC-2



Peak Report TIC

R.Time	Name	Area%
7.573	Toluene	0.01
12.064	Santene	0.94
13.223	Unidentified	0.02
14.268	Tricyclene	0.88
14.406	alpha-Thujene	0.15
14.909	alpha-Pinene	18.70
15.232	beta-Fenchene	0.01
15.759	alpha-Fenchne	0.18
15.888	Camphene	11.31
16.069	Thuja-2,4(10)diene	0.02
17.117	Unidentified	0.03
17.195	Sabinene	0.10
17.570	beta-Pinene	11.12
18.135	Myrcene	1.75
18.844	Unidentified	0.02
19.311	alpha-Phellandrene	0.14
19.493	delta-3-Carene	9.71
19.844	1,4-Cineole	0.01
19.991	alpha-Terpinene	0.19
20.144	meta-Cymene	0.01
20.264	Unidentified	0.01
20.492	para-Cymene	0.33
20.832	Limonene	6.66
20.945	beta-Phellandrene	0.69
21.028	1,8-cineole	0.26
21.146	(Z)-beta-Ocimene	0.02
22.741	gamma-Terpinene	0.14
23.708	Unidentified	0.02
24.326	Isoterpinolene	0.03
24.612	Terpinolene	0.97
24.880	Unidentified	0.02
24.927	Dehydro-para-cymene	0.09
25.435	Unidentified	0.02
25.523	Linalool	0.33
26.298	Unidentified	0.01
26.977	alpha-Fenchol	0.05
27.320	cis-para-Menth-2-en-1-ol	0.01
27.477	alpha-Campholenal	0.06
28.502	trans-Pinocarveol	0.10
28.800	trans-Verbenol	0.01
28.943	Camphor	0.15
29.164	Citronellal	0.03
29.518	trans-beta-Terpineol	0.18
29.865	trans-Pinocamphone	0.01
29.972	Pinocarvone	0.02
30.085	Isoborneol	0.05
30.673	Borneol	0.91
31.247	Terpinen-4-ol	0.24
31.642	para-Cymen-8-ol	0.03
31.765	Terpineol isomer	0.02
32.242	alpha-Terpineol	1.00
32.755	Unidentified	0.03
33.068	Verbenone	0.01
33.773	alpha-Fenchyl acetate	0.22
34.290	Citronellol	0.02
34.526	Methyl thymol ether	0.03
37.788	Chrysanthenyl acetate	0.05
38.062	Unidentified	0.09
38.404	Bornyl acetate	28.34
38.534	Isobornyl acetate	1.03
38.950	Unidentified	0.07
39.046	trans-Pinocarvyl acetate	0.06

Chromatogram Black Spruce - Barefut



Comments:

The analysis of this Black Spruce batch sample meets the expected chemical profile for authentic essential oil of *Picea mariana*. 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.

R.Time	Name	Area%
39.241	Unidentified	0.04
41.454	Unidentified	0.05
41.871	Unidentified	0.02
42.160	Unidentified	0.01
42.395	alpha-Terpinyl acetate	0.05
42.506	Citronellyl acetate	0.04
43.380	Unidentified	0.01
44.360	Geranyl acetate	0.28
45.243	beta-Elemene	0.03
46.626	Junipene	0.10
47.218	trans-beta-Caryophyllene	0.14
49.450	alpha-Humulene	0.04
49.845	cis-Cadina-1(6),4-diene	0.01
50.432	10-beta-H-Cadina-1(6),4-diene	0.03
50.603	trans-Cadina-1(6),4-diene	0.05
51.017	Germacrene D	0.03
51.689	trans-Muurola-4(14),5-diene	0.02
51.934	Unidentified	0.02
52.045	alpha-Murolene	0.11
52.563	beta-Bisabolene	0.02
52.941	gamma-Cadinene	0.14
53.216	delta-Cadinene	0.47
53.425	cis-Calamenene	0.05
53.515	Zonarene	0.02
54.086	trans-Cadina-1,4-diene	0.01
54.328	alpha-Cadinene	0.03
54.483	(E)-alpha-Bisabolene	0.08
54.624	Unidentified	0.02
59.620	1-epi-Cubenol	0.01
60.415	tau-Cadinol	0.07
60.519	epi-alpha-Cadinol	0.07
60.661	delta-Cadinol	0.02
61.166	alpha-Cadinol	0.12
65.062	Unidentified	0.02
65.203	Unidentified	0.02
		100.00