

Date : July 09, 2020

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 20G08-PTH12


Customer identification : Cedarwood Texas - Texas - CB810493R

Type : Essential oil

Source : *Juniperus mexicana* ct. rectified

Customer : Plant Therapy

ANALYSIS

Method: PC-MAT-014  - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID (in French); identifications validated by GC-MS.

Analyst : Alexis St-Gelais, M. Sc., chimiste

Analysis date : July 09, 2020

Checked and approved by :



Alexis St-Gelais, M. Sc., chimiste 2013-174

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PHYSICOCHEMICAL DATA

Physical aspect: Clear liquid

Refractive index: 1.5066 ± 0.0003 (20 °C; method PC-MAT-016)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

ANALYSIS SUMMARY – CONSOLIDATED CONTENTS

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
Tricyclene	tr	Monoterpene
Unknown	0.01	Monoterpene
α -Pinene	0.13	Monoterpene
α -Fenchene	0.02	Monoterpene
Camphene	0.01	Monoterpene
Thuja-2,4(10)-diene	0.02	Monoterpene
β -Pinene	0.01	Monoterpene
α -Methylstyrene	0.02	Normonoterpene
Myrcene	0.01	Monoterpene
Δ^3 -Carene	0.03	Monoterpene
para-Cymene	0.01	Monoterpene
Limonene	0.01	Monoterpene
Terpinolene	0.01	Monoterpene
<i>trans</i> -Pinocarveol	0.03	Monoterpenic alcohol
Camphor	0.01	Monoterpenic ketone
meta-Mentha-4,6-dien-8-ol	0.01	Monoterpenic alcohol
α -Phellandren-8-ol	0.01	Monoterpenic alcohol
Terpinen-4-ol	0.03	Monoterpenic alcohol
para-Cymen-8-ol	0.05	Monoterpenic alcohol
α -Terpineol	0.05	Monoterpenic alcohol
Myrtenol	0.04	Monoterpenic alcohol
Verbenone	0.05	Monoterpenic ketone
Carvacrol methyl ether	0.05	Monoterpenic ether
Brasila-1,10-diene	0.01	Sesquiterpene
Carvacrol	0.03	Monoterpenic alcohol
α -Terpinyl acetate	0.10	Monoterpenic ester
African-1-ene	0.03	Sesquiterpene
2-epi- α -Funebrene	0.12	Sesquiterpene
β -Patchoulene	0.02	Sesquiterpene
α -Duprezianene	0.34	Sesquiterpene
7-epi-Sesquithujene?	0.10	Sesquiterpene
Isolongifolene	0.03	Sesquiterpene
β -Elemene	0.56	Sesquiterpene
α -Chamipinene	0.05	Sesquiterpene
Unknown	0.09	Sesquiterpene
α -Cedrene	8.52	Sesquiterpene
β -Funebrene	0.08	Sesquiterpene
β -Caryophyllene	0.29	Sesquiterpene
β -Cedrene	2.69	Sesquiterpene
β -Duprezianene	0.43	Sesquiterpene
<i>cis</i> -Thujopsene	33.92	Sesquiterpene
Isobazzanene	0.13	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.04	Sesquiterpene
Prezizaene	0.08	Sesquiterpene
β -Barbatene	0.02	Sesquiterpene

α-Himachalene	0.43	Sesquiterpene
7,8-Dehydro-α-acoradiene?	0.16	Sesquiterpene
α-Humulene	0.05	Sesquiterpene
Cadina-4,11-diene	tr	Sesquiterpene
α-Acoradiene	0.24	Sesquiterpene
9-epi-β-Caryophyllene	0.16	Sesquiterpene
(E)-β-Farnesene	0.39	Sesquiterpene
β-Acoradiene	0.37	Sesquiterpene
Thujopsene isomer	0.12	Sesquiterpene
β-Chamigrene	0.47	Sesquiterpene
Unknown	0.10	Sesquiterpene
Unknown	0.13	Sesquiterpene
γ-Himachalene	0.35	Sesquiterpene
Widdra-2,4(14)-diene?	0.17	Sesquiterpene
Unknown	0.47	Sesquiterpene
ar-Curcumene	0.27	Sesquiterpene
Valencene	0.08	Sesquiterpene
α-Chamigrene	1.98	Sesquiterpene
Pseudowiddrene	0.09	Sesquiterpene
β-Himachalene	0.36	Sesquiterpene
α-Cuprenene	0.94	Sesquiterpene
Cuparene	1.82	Sesquiterpene
α-Alaskene	0.15	Sesquiterpene
α-Dehydro-ar-himachalene	0.03	Sesquiterpene
1,4-Dihydrocuparene	0.17	Sesquiterpene
Unknown	0.10	Sesquiterpene
β-Curcumene	0.12	Sesquiterpene
γ-Cadinene	0.24	Sesquiterpene
δ-Cadinene	0.47	Sesquiterpene
γ-Dehydro-ar-himachalene	0.05	Sesquiterpene
β-Sesquiphellandrene	0.08	Sesquiterpene
γ-Cuprenene	0.37	Sesquiterpene
(E)-γ-Bisabolene	0.18	Sesquiterpene
Unknown	0.08	Oxygenated sesquiterpene
δ-Cuprenene epimer I	0.13	Sesquiterpene
δ-Cuprenene epimer II	0.22	Sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.06	Oxygenated sesquiterpene
Unknown	0.09	Oxygenated sesquiterpene
Caryophyllenyl alcohol	0.05	Sesquiterpenic alcohol
Unknown	0.06	Sesquiterpene
Caryophyllene oxide	0.06	Sesquiterpenic ether
allo-Cedrol	0.50	Sesquiterpenic alcohol
α-Cedrol	26.73	Sesquiterpenic alcohol
Widdrol	1.52	Sesquiterpenic alcohol
epi-Cedrol	0.59	Sesquiterpenic alcohol
β-Himachalene oxide	0.03	Sesquiterpenic ether
Unknown	0.03	Oxygenated sesquiterpene
β-Biotol	0.06	Sesquiterpenic alcohol
10-epi-Cubenol	0.09	Sesquiterpenic alcohol
Unknown	0.05	Oxygenated sesquiterpene
α-Acorenol	0.85	Sesquiterpenic alcohol

β-Acorenol	0.16	Sesquiterpenic alcohol
Unknown	0.10	Oxygenated sesquiterpene
Unknown	0.13	Oxygenated sesquiterpene
Unknown	0.04	Oxygenated sesquiterpene
Unknown	0.35	Oxygenated sesquiterpene
Himachalol	0.22	Sesquiterpenic alcohol
Unknown	0.18	Oxygenated sesquiterpene
Cedrenol analog	0.17	Sesquiterpenic alcohol
14-Hydroxy-9-epi-(E)-caryophyllene	0.09	Sesquiterpenic alcohol
1,7-diepi-α-Cedrenal?	0.22	Sesquiterpenic aldehyde
α-Cedrenol	0.12	Sesquiterpenic alcohol
Unknown	0.36	Oxygenated sesquiterpene
Mayurone?	0.04	Norsesquiterpenic ketone
Thujopsenal	0.04	Sesquiterpenic aldehyde
Unknown	0.03	Oxygenated sesquiterpene
Thujopsenal analog	0.07	Sesquiterpenic aldehyde
Unknown	0.08	Oxygenated sesquiterpene
Cuparenal	0.03	Sesquiterpenic aldehyde
Cedryl acetate	0.32	Sesquiterpenic ester
Unknown	0.04	Oxygenated sesquiterpene
Unknown	0.11	Oxygenated sesquiterpene
Consolidated total	93.55%	

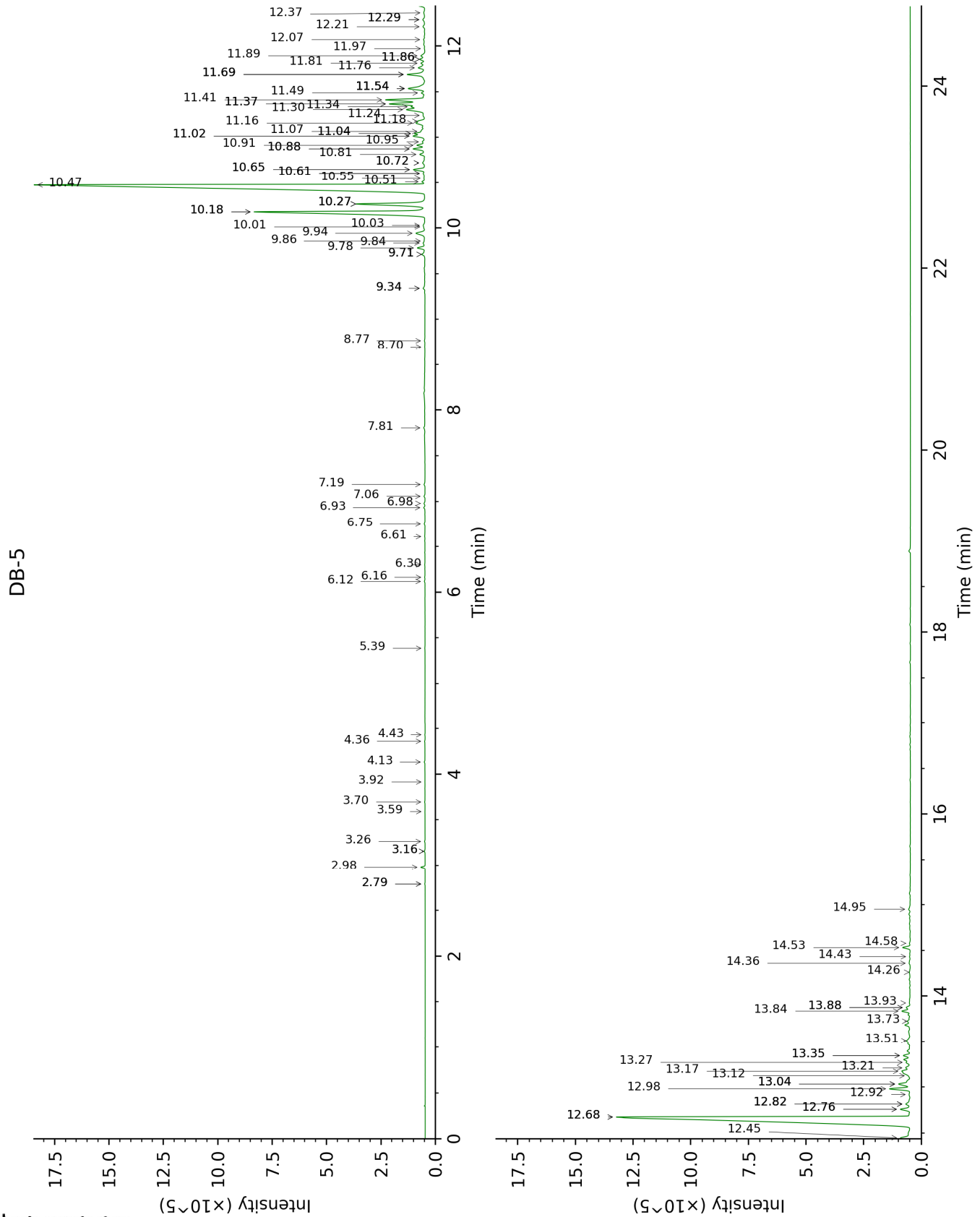
tr: The compound has been detected below 0.005% of total signal.

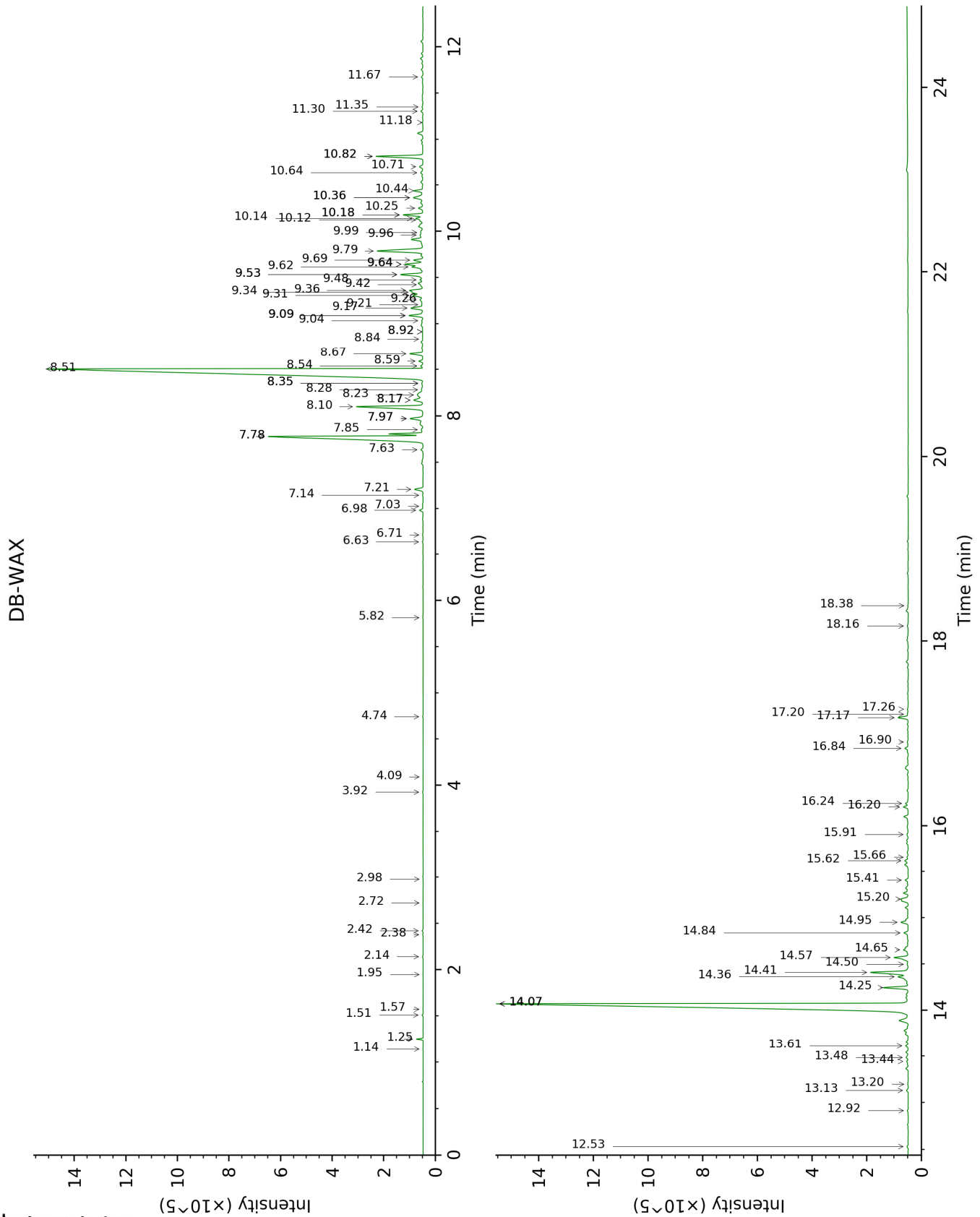
Note: no correction factor was applied

About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report to access the full untreated data and perform their own calculations if needed.

Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

This page was intentionally left blank. The following pages present the complete data of the analysis.





FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Tricyclene	2.79*	918	0.02	1.14	968	tr
Unknown [m/z 105, 79 (80), 91 (78), 77 (69), 78 (56), 93 (46), 120 (44)... 136 (4)]	2.79*	918	[0.02]	2.38	1106	0.01
α -Pinene	2.98	930	0.13	1.25	988	0.13
α -Fenchene	3.16*	942	0.03	1.51	1018	0.02
Camphene	3.16*	942	[0.03]	1.57	1025	0.01
Thuja-2,4(10)-diene	3.26	949	0.02	2.14	1084	0.02
β -Pinene	3.59	970	0.01	1.95	1064	tr
α -Methylstyrene	3.70	977	0.02	4.74	1289	0.01
Myrcene	3.92	992	0.01	2.72	1134	tr
Δ^3 -Carene	4.13	1006	0.03	2.42	1110	0.03
para-Cymene	4.36	1020	0.01	3.92	1228	0.01
Limonene	4.43	1025	0.01	2.98	1155	tr
Terpinolene	5.39	1085	0.01	4.09	1241	tr
<i>trans</i> -Pinocarveol	6.12	1132	0.03	8.92*	1596	0.03
Camphor	6.16	1135	0.01	7.03	1451	0.02
meta-Mentha-4,6-dien-8-ol	6.30	1144	0.01	9.09*	1610	0.52
α -Phellandren-8-ol	6.61	1164	0.01	9.96	1681	0.14
Terpinen-4-ol	6.75	1172	0.03	8.35*	1552	0.07
para-Cymen-8-ol	6.93	1185	0.05	11.30	1794	0.07
α -Terpineol	6.98	1188	0.05	9.53*	1646	0.89
Myrtenol	7.06	1193	0.04	10.64	1738	0.09
Verbenone	7.19	1201	0.05	9.42	1637	0.08
Carvacrol methyl ether	7.81	1243	0.05	8.35*	1552	[0.07]
Brasila-1,10-diene	8.70	1305	0.01	5.82	1362	0.01
Carvacrol	8.77	1305	0.03	15.20	2158	0.23
α -Terpinyl acetate	9.34*	1346	0.11	9.48	1642	0.10
African-1-ene	9.34*	1346	[0.11]	6.63	1422	0.03
2-epi- α -Funebrene	9.71*	1372	0.18	6.98	1448	0.12
β -Patchoulene	9.71*	1372	[0.18]	6.71	1427	0.02
α -Duprezianene	9.78	1377	0.34	7.21	1465	0.31
7-epi-Sesquithujene?	9.84	1381	0.10	7.64	1496	0.08
Isolongifolene	9.86	1383	0.03	7.14	1460	0.01
β -Elemene	9.94	1388	0.56	8.17*†	1538	0.89
α -Chamipinene	10.01	1394	0.05	7.78*	1508	8.56
Unknown [m/z 107, 91 (86), 93 (83), 79 (81), 162 (74), 41 (73), 133 (72)... 204 (13)]	10.03	1395	0.09	7.97*	1523	0.52
α -Cedrene	10.18*	1405	10.02	7.78*	1508	[8.56]
β -Funebrene	10.18*	1405	[10.02]	7.85	1513	0.08
β -Caryophyllene	10.26*	1412	3.53	8.23†	1542	[0.89]

β-Cedrene	10.26*	1412	[3.53]	8.10	1533	2.69
β-Duprezianene	10.26*	1412	[3.53]	7.97*	1523	[0.52]
cis-Thujopsene	10.48	1427	33.92	8.51	1564	33.12
Isobazzanene	10.51	1430	0.13	8.28	1547	0.09
trans-α-Bergamotene	10.55	1433	0.04	8.17*†	1538	[0.89]
Prezizaene	10.61*	1437	0.10	8.54	1567	0.08
β-Barbatene	10.61*	1437	[0.10]	8.84	1590	0.02
α-Himachalene	10.65*	1440	0.54	8.67	1577	0.43
7,8-Dehydro-α-acoradiene?	10.65*	1440	[0.54]	9.26	1624	0.16
α-Humulene	10.72*	1446	0.15	9.04	1606	0.05
Cadina-4,11-diene	10.72*	1446	[0.15]	8.92*	1596	[0.03]
α-Acoradiene	10.82	1453	0.24	9.09*	1610	[0.52]
9-epi-β-Caryophyllene	10.88*	1457	0.55	9.09*	1610	[0.52]
(E)-β-Farnesene	10.88*	1457	[0.55]	9.31	1628	0.39
β-Acoradiene	10.92	1460	0.37	9.17	1617	0.47
Thujopsene isomer	10.95	1463	0.12	9.21	1620	0.04
β-Chamigrene	11.02*	1468	0.57	9.36	1632	0.47
Unknown [m/z 91, 105 (93), 161 (77), 93 (73), 119 (71), 133 (69)... 204 (31)]	11.02*	1468	[0.57]			
Unknown [m/z 118, 69 (82), 91 (51), 117 (40)... 202 (25)]	11.04*	1470	0.48	8.59	1571	0.13
γ-Himachalene	11.04*	1470	[0.48]	9.34	1631	0.35
Widdra-2,4(14)-diene?	11.07	1472	0.17	9.53*	1646	[0.89]
Unknown [m/z 189, 91 (95), 105 (93), 133 (84), 119 (75), 41 (59), 93 (46)... 204 (33)]	11.16	1478	0.47	9.64*	1655	0.64
ar-Curcumene	11.18	1480	0.27	10.44	1721	0.30
Valencene	11.24	1485	0.08	9.64*	1655	[0.64]
α-Chamigrene	11.30†	1489	3.38	9.79	1667	1.98
Pseudowiddrene	11.34†	1492	[3.38]	9.64*	1655	[0.64]
β-Himachalene	11.37*†	1494	[3.38]	9.62	1653	0.36
α-Cuprenene	11.37*†	1494	[3.38]			
Cuparene	11.41	1497	1.82	10.82*	1753	1.60
α-Alaskene	11.49	1503	0.15	9.69	1659	0.32
α-Dehydro-ar-himachalene	11.54*	1507	1.07	11.35	1798	0.03
1,4-Dihydrocuparene	11.54*	1507	[1.07]	10.25	1705	0.17
Unknown [m/z 121, 123 (45), 91 (24), 107 (24), 122 (24), 95 (23)... 204 (11)]	11.54*	1507	[1.07]	10.12	1694	0.10
β-Curcumene	11.54*	1507	[1.07]	9.99	1683	0.12

γ-Cadinene	11.54*	1507	[1.07]	10.14	1695	0.24
δ-Cadinene	11.69*	1519	0.99	10.18*	1699	0.64
γ-Dehydro-ar-himachalene	11.69*	1519	[0.99]	11.67	1827	0.05
β-Sesquiphellandrene	11.69*	1519	[0.99]	10.36*	1714	0.45
γ-Cuprenene	11.76	1525	0.37	10.36*	1714	[0.45]
(E)-γ-Bisabolene	11.81	1529	0.18	10.18*	1699	[0.64]
Unknown [m/z 43, 95 (81), 207 (61), 41 (55), 55 (50)... 222 (3)]	11.86*	1532	0.25	13.61	2003	0.08
δ-Cuprenene epimer I	11.86*	1532	[0.25]	10.70	1743	0.13
δ-Cuprenene epimer II	11.89	1535	0.22	10.82*	1753	[1.60]
Unknown [m/z 106, 41 (86), 43 (84), 149 (75), 69 (75), 91 (63), 93 (61)... 220 (1)]	11.97	1541	0.02	11.18	1784	0.02
Unknown [m/z 91, 119 (98), 121 (91), 105 (85), 43 (82), 41 (76)... 205 (37), 220 (16)]	12.07	1549	0.06	13.13	1958	0.06
Unknown [m/z 95, 191 (52), 107 (50), 121 (32), 81 (31)...]	12.21	1560	0.09	14.07*	2047	27.32
Caryophyllenyl alcohol	12.29*	1566	0.12	13.44	1987	0.05
Unknown [m/z 95, 131 (96), 202 (64), 187 (61), 159 (55), 105 (50)...202 (64)]	12.29*	1566	[0.12]			
Caryophyllene oxide	12.36	1572	0.06	12.53	1903	0.04
allo-Cedrol	12.45	1579	0.50	14.07*	2047	[27.32]
α-Cedrol	12.68*	1597	28.74	14.07*	2047	[27.32]
Widdrol	12.68*	1597	[28.74]	14.41	2080	1.52
epi-Cedrol	12.76*	1603	0.45	14.57	2095	0.59
β-Himachalene oxide	12.76*	1603	[0.45]	12.92	1939	0.03
Unknown [m/z 138, 110 (77), 137 (75), 107 (62), 91 (61), 93 (60), 109 (57)... 220 (34)]	12.82*	1608	0.26	13.20	1965	0.03
β-Biotol	12.82*	1608	[0.26]	15.91	2230	0.06
10-epi-Cubenol	12.82*	1608	[0.26]	13.48	1991	0.09
Unknown [m/z 107, 41 (86), 123 (85), 82 (79), 95 (77), 93 (76)]	12.92	1616	0.05	14.50	2088	0.05

91 (73), 69 (71)... 220 (13)]						
α-Acorenol	12.98	1622	0.85	14.25	2064	0.80
β-Acorenol	13.04*	1626	0.60	14.65	2104	0.16
Unknown [m/z 132, 175 (22), 119 (18), 91 (18), 157 (18)... 219 (10)]	13.04*	1626	[0.60]	15.41	2178	0.10
Unknown [m/z 105, 93 (78), 95 (75), 131 (72), 119 (71), 132 (70), 91 (67), 120 (49)... 202 (39), 220 (9)]	13.04*	1626	[0.60]	15.62	2200	0.13
Unknown [m/z 132, 91 (24), 119 (22), 105 (21), 133 (17), 117 (16)... 219 (3)]	13.12	1633	0.04			
Unknown [m/z 123, 81 (77), 95 (77), 107 (72), 41 (72), 93 (66), 55 (64)... 220? (13)]	13.17	1638	0.35			
Himachalol	13.21	1640	0.22	14.95	2133	0.27
Unknown [m/z 41, 91 (96), 79 (88), 69 (82), 123 (80), 93 (80)... 220 (8)]	13.27	1646	0.18	17.17	2363	0.35
Cedrenol analog	13.34*	1652	0.30	16.20	2260	0.17
14-Hydroxy-9-epi- (E)-caryophyllene	13.34*	1652	[0.30]	16.24	2264	0.09
1,7-diepi-α- Cedrenal?	13.51	1665	0.22	14.84	2122	0.19
α-Cedrenol	13.73	1683	0.12	16.84	2327	0.11
Unknown [m/z 91, 105 (87), 123 (74), 135 (70), 107 (60), 79 (59)... 220 (13)]	13.84	1692	0.36			
Mayurone?	13.88*	1696	0.18	16.90	2335	0.04
Thujopsenal	13.88*	1696	[0.18]	15.66	2204	0.04
Unknown [m/z 105, 69 (77), 91 (66), 119 (65), 111 (56), 107 (45), 55 (45)... 220? (2)]	13.93	1700	0.03	17.26	2372	0.03
Thujopsenal analog	14.26	1729	0.07	17.20	2367	0.03
Unknown [m/z 105, 91 (83), 79 (78), 135 (67), 107 (56), 67 (53)... 220 (9)]	14.36	1737	0.08			
Cuparenal	14.43	1744	0.03			
Cedryl acetate	14.53	1752	0.32	14.36	2075	0.35
Unknown [m/z 91,	14.58	1756	0.04	18.16	2472	0.05

105 (74), 93 (67), 79 (59), 133 (54), 41 (47), 107 (46)...						
Unknown [m/z 121, 136 (53), 91 (22), 93 (19), 79 (15), 105 (13)... 220 (3)]	14.95	1789	0.11	18.38	2497	0.02
Total identified	94.77%			90.49%		
Total reported	96.73%			91.66%		

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken into account in the consolidated total

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

R.T.: Retention time (minutes)

R.I.: Retention index