

Date : April 24, 2022

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 22D14-PTH01

Customer identification : Patchouli ORGANIC - India - PI0103R

Type : Essential oil

Source : *Pogostemon cablin*

Customer : Plant Therapy

ANALYSIS

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

Analyst : Seydou Ka, Ph. D.

Analysis date : April 22, 2022

Checked and approved by :

Alexis St-Gelais, Ph. D., Chimiste 2013-174

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PHYSICOCHEMICAL DATA

Physical aspect: Yellow viscous liquid

Refractive index: 1.5084 ± 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
5-Methyl-2-hexanone	tr	Aliphatic ketone
α -Pinene	0.10	Monoterpene
Sabinene	tr	Monoterpene
β -Pinene	0.24	Monoterpene
Octen-3-ol	0.01	Aliphatic alcohol
Octan-3-one	tr	Aliphatic ketone
Myrcene	tr	Monoterpene
Octan-3-ol	tr	Aliphatic alcohol
Limonene	0.02	Monoterpene
Linalool	tr	Monoterpenic alcohol
Unknown	0.01	Unknown
δ -Elemene	0.14	Sesquiterpene
α -Copaene	0.01	Sesquiterpene
β -Patchoulene	2.51	Sesquiterpene
β -Bourbonene	0.02	Sesquiterpene
<i>cis</i> - β -Elemene	0.04	Sesquiterpene
β -Elemene	1.13	Sesquiterpene
Isocaryophyllene	0.02	Sesquiterpene
Cycloseychellene	0.45	Sesquiterpene
β -Caryophyllene	3.34	Sesquiterpene
Seychellene	6.07	Sesquiterpene
Selina-5,11-diene	0.05	Sesquiterpene
α -Guaiene	13.99	Sesquiterpene
Unknown	0.07	Sesquiterpene
α -Humulene	0.59	Sesquiterpene
α -Patchoulene	4.94	Sesquiterpene
Patchoulene analog I	1.76	Sesquiterpene
γ -Patchoulene	0.96	Sesquiterpene
9- <i>epi</i> - β -Caryophyllene	0.01	Sesquiterpene
Unknown	0.43	Sesquiterpene
Selina-4,11-diene	0.55*	Sesquiterpene
Unknown	0.55*	Sesquiterpene
β -Selinene	0.07	Sesquiterpene
Patchoulene analog II	0.25	Sesquiterpene
Unknown	0.30	Sesquiterpene
Unknown	0.16	Sesquiterpene
δ -Selinene	0.09	Sesquiterpene
α -Selinene	0.08	Sesquiterpene
Aciphyllene	2.95	Sesquiterpene
Eudesma-2,4(15),11-triene	0.17	Sesquiterpene
Pentadecane	0.21	Alkane
δ -Guaiene	18.40	Sesquiterpene
7- <i>epi</i> - α -Selinene	0.13	Sesquiterpene
Nootkatene	0.02	Sesquiterpene
γ -Cadinene	0.40	Sesquiterpene

Unknown	0.06	Sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.11	Oxygenated sesquiterpene
Unknown	0.04	Oxygenated sesquiterpene
Unknown	0.05	Sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Norpatchoulénol	0.52	Norsesquiterpenic alcohol
Unknown	0.04	Oxygenated sesquiterpene
Unknown	0.05	Oxygenated sesquiterpene
Unknown	0.21	Oxygenated sesquiterpene
Caryophyllène oxide	0.28	Sesquiterpenic ether
Caryophyllène oxide isomer	0.07	Sesquiterpenic ether
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.48	Oxygenated sesquiterpene
Unknown	0.13	Oxygenated sesquiterpene
Humulène epoxide II	0.02	Sesquiterpenic ether
Hexadécane	0.04	Alkane
Unknown	0.06	Oxygenated sesquiterpene
Unknown	0.20	Oxygenated sesquiterpene
Unknown	0.22	Oxygenated sesquiterpene
Caryophylladiénol I	0.56	Sesquiterpenic alcohol
Caryophylladiénol II	0.06	Sesquiterpenic alcohol
Hinesol	0.41	Sesquiterpenic alcohol
Pogostol	2.15	Sesquiterpenic alcohol
Patchoulol	29.29	Sesquiterpenic alcohol
Unknown	0.22	Oxygenated sesquiterpene
Unknown	0.15	Unknown
Unknown	0.04	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Rotundone	0.11	Sesquiterpenic ketone
Unknown	0.05	Oxygenated sesquiterpene
Pogostone	1.80	Terpenic lactone
Unknown	0.19	Oxygenated sesquiterpene
Unknown	0.09	Oxygenated sesquiterpene
Unknown	0.05	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	tr	Oxygenated sesquiterpene
Unknown	0.03	Oxygenated sesquiterpene
Unknown	0.09	Oxygenated sesquiterpene
Unknown	0.08	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.03	Oxygenated sesquiterpene
Phytol	0.03	Diterpenic alcohol
Consolidated total	98.87%	

*: Individual compounds concentration could not be found due to overlapping coelutions on columns considered

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

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

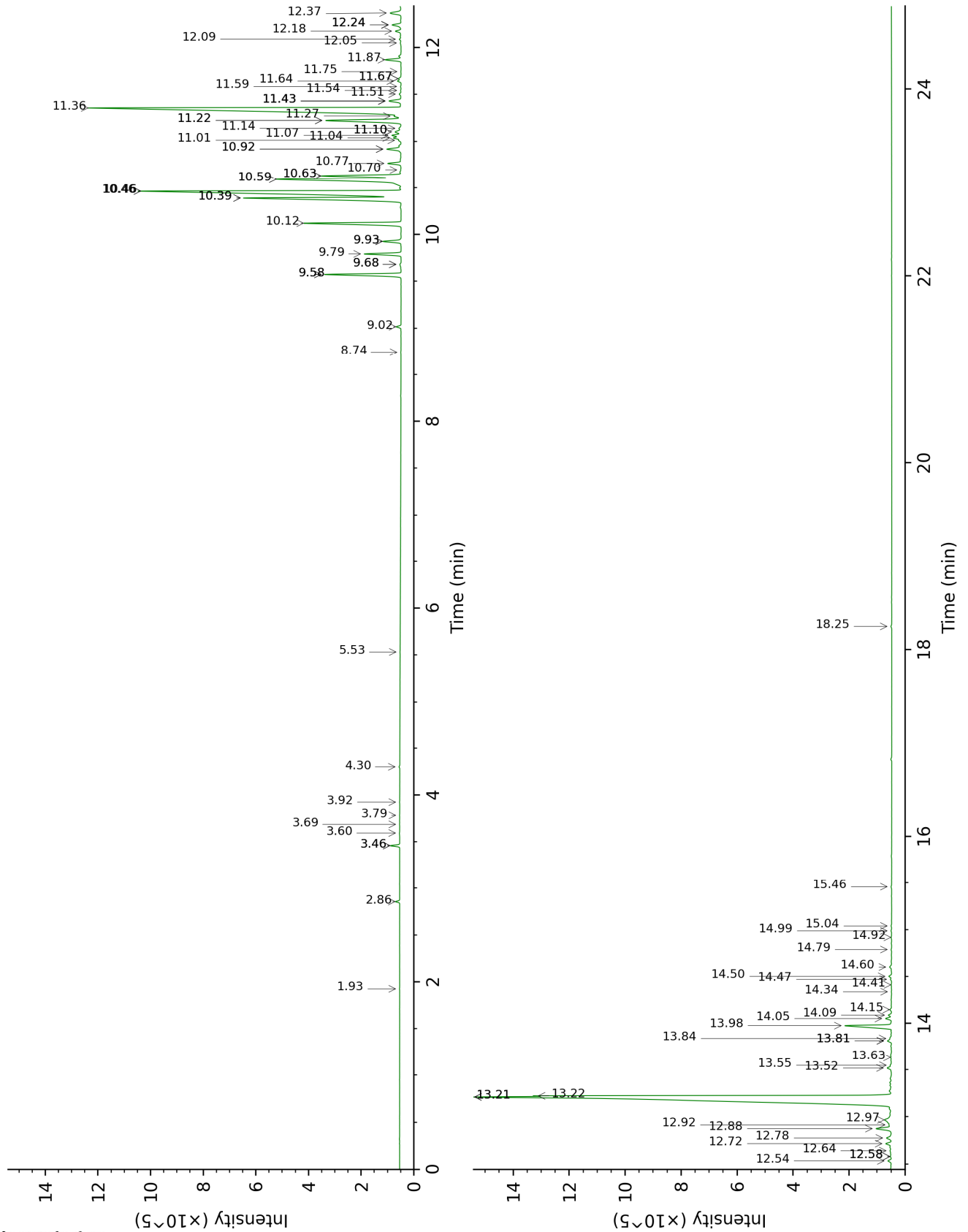
Note: no correction factor was applied

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.

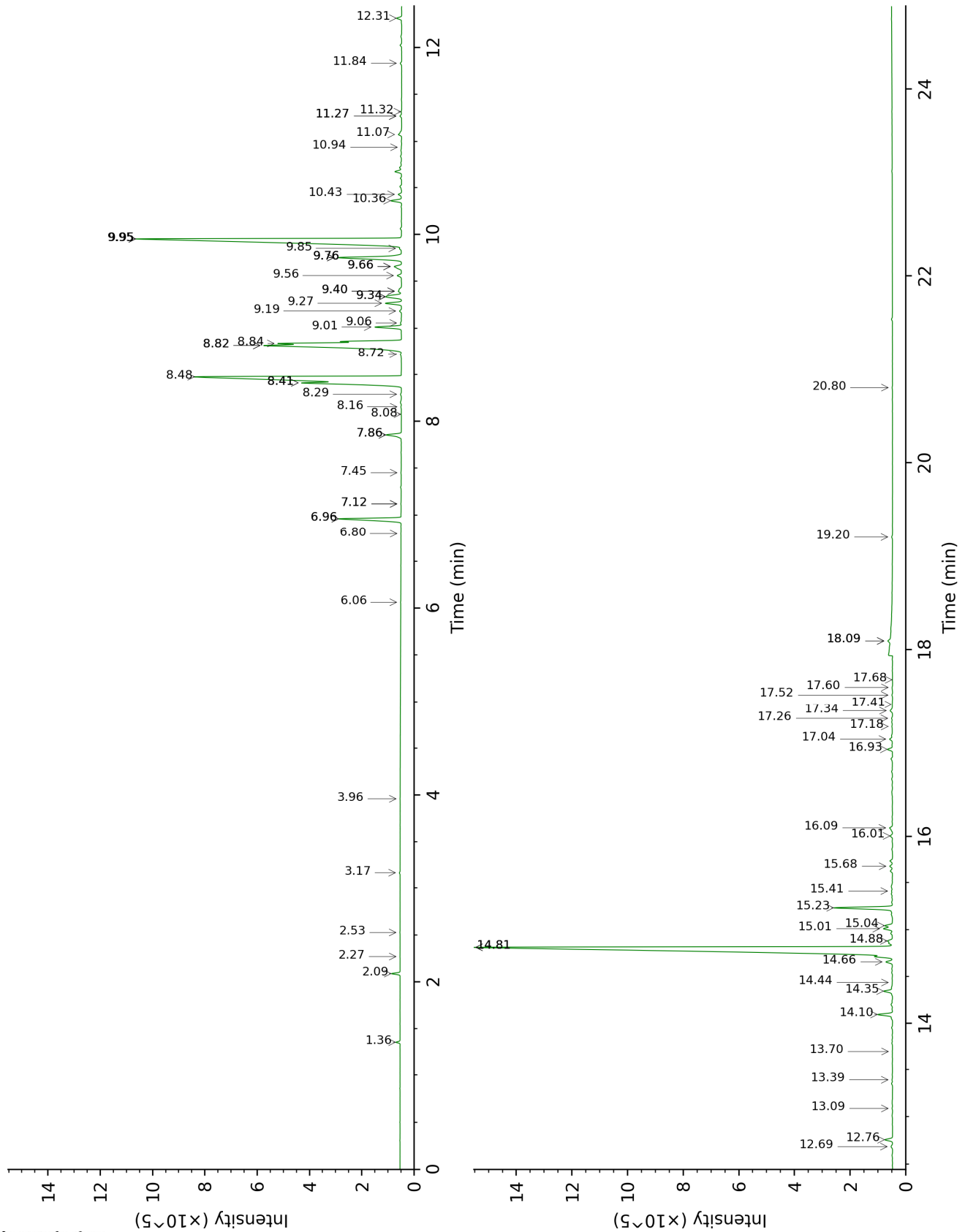
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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

DB-5



DB-WAX



FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
5-Methyl-2-hexanone	1.93	856	tr	2.53	1107	0.01
α -Pinene	2.86	930	0.10	1.36	991	0.10
Sabinene	3.46*	971	0.24	2.27	1084	tr
β -Pinene	3.46*	971	[0.24]	2.09	1066	0.24
Octen-3-ol	3.60	980	0.01	6.80	1424	tr
Octan-3-one	3.69	986	tr	3.96	1220	tr
Myrcene	3.78	993	tr			
Octan-3-ol	3.92	1002	tr	6.06	1371	0.01
Limonene	4.30	1026	0.02	3.17	1158	0.02
Linalool	5.53	1104	tr	8.08	1519	0.01
Unknown [m/z 159, 117 (68), 132 (55), 200 (35)]	8.74	1315	0.01	7.12*	1448	0.01
δ -Elemene	9.02	1334	0.14	6.96*	1436	2.65
α -Copaene	9.58*	1374	2.48	7.12*	1448	[0.01]
β -Patchoulene	9.58*	1374	[2.48]	6.96*	1436	[2.65]
β -Bourbonene	9.68*	1381	0.06	7.45	1472	0.02
<i>cis</i> - β -Elemene	9.68*	1381	[0.06]	8.29	1535	0.04
β -Elemene	9.79	1389	1.13	8.41*†	1544	18.47
Isocaryophyllene	9.93*	1398	0.60	8.16	1525	0.02
Cycloseychellene	9.93*	1398	[0.60]	7.86*	1502	0.66
β -Caryophyllene	10.12	1413	3.34	8.41*†	1544	[18.47]
Seychellene	10.39*†	1433	20.18	8.82*†	1575	12.94
Selina-5,11-diene	10.39*†	1433	[20.18]	8.72	1568	0.05
α -Guaiene	10.46*†	1438	[20.18]	8.48†	1549	[18.47]
Unknown [m/z 91, 93 (98), 79 (82), 81 (82), 105 (71), 107 (70)... 204 (38)]	10.46*†	1438	[20.18]	9.18	1604	0.07
α -Humulene	10.59*	1448	5.53	9.27	1611	0.59
α -Patchoulene	10.59*	1448	[5.53]	8.82*†	1575	[12.94]
Patchoulene analog I	10.63*	1450	2.72	8.84†	1577	[12.94]
γ -Patchoulene	10.63*	1450	[2.72]	9.01	1590	0.96
9-epi- β -Caryophyllene	10.70	1455	0.01	9.40*†	1621	[1.08]
Unknown [m/z 159, 91 (88), 93 (72), 79 (69), 105 (68), 41 (66), 81 (54), 202? (50)...]	10.77	1460	0.43	9.34*†	1616	1.08
Selina-4,11-diene	10.92*	1472	0.55	9.40*†	1621	[1.08]
Unknown [m/z 147, 93 (87), 107 (77), 105 (77), 91	10.92*	1472	[0.55]	9.34*†	1616	[1.08]

(73), 79 (63)... 204 (21)]						
β-Selinene	11.01	1479	0.07	9.85	1657	0.07
Patchoulene analog II	11.04	1481	0.25	9.76*	1650	3.05
Unknown [m/z 79, 107 (99), 91 (88), 93 (86), 81 (78), 105 (73), 41 (73)... 204? (12)]	11.07	1483	0.30	9.66*	1642	0.39
Unknown [m/z 161, 189 (96), 91 (74), 204 (73), 105 (69), 41 (52)]	11.10*	1486	0.25	9.76*	1650	[3.05]
δ-Selinene	11.10*	1486	[0.25]	9.66*	1642	[0.39]
α-Selinene	11.14	1488	0.08	9.95*	1666	18.75
Aciphyllene	11.22*	1495	3.13	9.76*	1650	[3.05]
Eudesma-2,4(15),11-triene	11.22*	1495	[3.13]	11.08	1758	0.17
Pentadecane	11.27	1498	0.21	7.86*	1502	[0.66]
δ-Guaiene	11.36	1505	18.40	9.95*	1666	[18.75]
7-epi-α-Selinene	11.43*	1510	0.47	10.43	1704	0.13
Nootkatene	11.43*	1510	[0.47]	10.94	1747	0.02
γ-Cadinene	11.43*	1510	[0.47]	10.36	1699	0.40
Unknown [m/z 159, 91 (81), 117 (68), 131 (51), 105 (46)... 202 (37)]	11.51	1516	0.06	9.56	1634	0.17
Unknown [m/z 41, 67 (95), 93 (92), 107 (91), 55 (77), 81 (77), 79 (73)... 205 (17)...]	11.54	1519	0.01	11.32	1779	0.02
Unknown [m/z 161, 119 (92), 91 (69), 105 (52), 145 (49)... 218 (6)]	11.59	1523	0.01	11.27*	1775	0.06
Unknown [m/z 91, 105 (98), 108 (83), 93 (82), 133 (79), 77 (64), 79 (57), 41 (56), 145 (55)... 218? (5)]	11.64	1527	0.11			
Unknown [m/z 91, 105 (78), 93 (77), 107 (71), 79 (64), 41 (63), 77 (63), 145 (60)... 218 (17)]	11.67*	1529	0.09			
Unknown [m/z 133, 105 (70), 146 (69), 145 (61), 91	11.67*	1529	[0.09]	11.27*	1775	[0.06]

(55), 131 (45), 187 (42), 159 (39), 119 (33), 202 (30)...						
Unknown [m/z 145, 131 (91), 91 (86), 105 (68), 146 (66), 43 (54)...	11.75	1535	0.01			
220? (5)] Norpatchoulenol	11.87	1545	0.52	14.10	2030	0.55
Unknown [m/z 191, 159 (66), 133 (53), 91 (45), 41 (42), 177 (35), 105 (33), 220 (32)]	12.05	1559	0.04	13.70	1992	0.01
Unknown [m/z 41, 67 (90), 55 (87), 79 (85), 107 (84), 81 (84), 93 (84), 121 (77), 91 (74)...	12.09	1562	0.05			
220 (7)] Unknown [m/z 43, 107 (94), 81 (71), 41 (63), 67 (58), 111 (58), 93 (55), 83 (54)...	12.18	1569	0.21	12.32	1866	0.19
205 (8), 220 (1)] Caryophyllene oxide	12.24*	1574	0.35	12.76	1906	0.28
Caryophyllene oxide isomer	12.24*	1574	[0.35]	12.69	1899	0.07
Unknown isomer	12.24*	1574	[0.35]	14.44	2063	0.01
Unknown [m/z 43, 79 (44), 81 (41), 93 (40), 91 (40)...	12.37	1584	0.48	14.34	2054	0.36
220 (5)] Unknown [m/z 43, 105 (77), 91 (71), 93 (68), 41 (62), 107 (6)...	12.54	1597	0.13	14.66	2084	0.26
205 (41), 220 (7)] Humulene epoxide II	12.58*	1601	0.05	13.39	1964	0.02
Hexadecane	12.58*	1601	[0.05]	9.06	1594	0.04
Unknown [m/z 43, 161 (73), 91 (53), 95 (52), 79 (46), 119 (45)...	12.64	1606	0.06	14.81*†	2099	29.69
205 (29), 220? (1)] Unknown [m/z 41, 91 (92), 55 (81), 93 (81), 79 (74), 43 (71), 95	12.72	1612	0.20	14.88	2106	0.19

(68), 123 (65)... 220 (17)]						
Unknown [m/z 43, 79 (41), 93 (39), 41 (39), 91 (38), 81 (36)... 220 (3)]	12.78	1617	0.22			
Caryophylladienol I	12.88	1625	0.56			
Caryophylladienol II	12.92	1628	0.06	16.09	2229	0.16
Hinesol	12.97	1633	0.41	15.01†	2119	0.63
Pogostol	13.21*†	1653	31.65	15.23	2141	2.15
Patchoulol	13.21*†	1653	[31.65]	14.81*†	2099	[29.69]
Unknown [m/z 175, 218 (59), 133 (49), 91 (43), 41 (38), 147 (36)]	13.22†	1654	[31.65]	15.04†	2122	[0.63]
Unknown [m/z 111, 250 (38), 126 (27), 139 (26), 43 (16), 41 (15), 166 (15)]	13.52	1678	0.15	11.84	1824	0.05
Unknown [m/z 91, 41 (100), 107 (98), 108 (95), 95 (87), 93 (87), 105 (85), 79 (77), 119 (72)... 220? (15)]	13.55	1680	0.04	16.01	2220	0.09
Unknown [m/z 43, 41 (95), 97 (89), 109 (71), 55 (71), 107 (70), 95 (69), 110 (65)... 222 (5)]	13.63	1687	0.02	15.41	2159	0.04
Unknown [m/z 105, 107 (98), 91 (95), 166 (80), 248 (80), 93 (76)... 233 (66)]	13.81*	1702	0.15	13.09	1936	0.02
Rotundone	13.81*	1702	[0.15]	15.68	2186	0.11
Unknown [m/z 43, 41 (82), 137 (78), 109 (76), 95 (75), 91 (72), 55 (67)... 220? (14)]	13.84	1705	0.05			
Pogostone	13.98	1716	1.80			
Unknown [m/z 107, 93 (87), 41 (83), 81 (82), 67 (80), 55 (76)... 204	14.05	1723	0.19	16.93	2317	0.18

(53), 207 (34), 222 (9)]						
Unknown [m/z 83, 43 (85), 55 (39), 41 (29), 121 (27), 120 (25)... 218 (3)]	14.09	1726	0.09	17.04	2329	0.12
Unknown [m/z 133, 148 (68), 147 (59), 91 (56), 79 (45), 105 (44)... 218 (8)]	14.15	1731	0.05	17.18	2343	0.03
Unknown [m/z 43, 83 (93), 55 (42), 41 (37), 121 (34), 111 (28)... 222? (1)]	14.34	1748	0.01	17.52	2380	0.02
Unknown [m/z 134, 107 (96), 91 (84), 93 (78), 79 (77), 41 (74), 43 (66), 77 (65)...]	14.41	1754	tr	17.41	2369	0.02
Unknown [m/z 43, 191 (68), 41 (62), 91 (51), 95 (49), 110 (44)... 234 (22)]	14.47	1759	0.03			
Unknown [m/z 91, 105 (88), 95 (79), 93 (78), 81 (72), 79 (66)... 205 (33), 220 (7)...]	14.50	1762	0.09	17.68	2398	0.01
Unknown [m/z 149, 131 (54), 105 (48), 91 (46), 41 (30), 93 (27)... 218 (23)]	14.60	1771	0.08	17.34	2361	0.12
Unknown [m/z 43, 95 (58), 67 (50), 41 (47), 55 (38), 109 (37)... 221 (9)... 236? (3)]	14.79	1787	0.01	18.09*	2445	0.09
Unknown [m/z 219, 43 (67), 91 (46), 79 (42), 41 (41), 55 (36)... 234 (6)]	14.92	1798	0.02	18.09*	2445	[0.09]
Unknown [m/z 43, 91 (77), 79 (74), 109 (73), 110 (71)... 218 (52), 234? (1)]	14.99	1804	0.02	17.60	2389	0.03

Unknown [m/z 91, 41 (79), 43 (74), 79 (72), 105 (65), 77 (64), 147 (64), 93 (61)... 218 (26), 234 (14)]	15.04	1809	0.02	17.26	2352	0.04
Unknown [m/z 41, 110 (77), 55 (75), 69 (74), 43 (74), 95 (71), 97 (71), 123 (71), 67 (63), 136 (56)... 236? (7)]	15.46	1847	0.03	20.80	2767	0.01
Phytol	18.25	2116	0.03	19.20	2572	0.03
Total identified	95.66%			94.72%		
Total reported	98.89%			96.76%		

*: 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