

Date : October 05, 2021

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 21I21-PTH03

Customer identification : Patchouli - Indonesia - P20109201R

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 : October 01, 2021

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Orange liquid

Refractive index: 1.5089 ± 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
α-Pinene	0.11	Monoterpene
β-Pinene	0.26	Monoterpene
Sabinene	tr	Monoterpene
Octen-3-ol	tr	Aliphatic alcohol
Octan-3-one	tr	Aliphatic ketone
Myrcene	tr	Monoterpene
Octan-3-ol	tr	Aliphatic alcohol
Limonene	0.02	Monoterpene
Linalool	0.01	Monoterpenic alcohol
Unknown	0.01	Unknown
δ-Elemene	0.14	Sesquiterpene
α-Copaene	0.01	Sesquiterpene
β-Patchoulene	2.24	Sesquiterpene
1,5-diepi-β-Bourbonene	0.02	Sesquiterpene
cis-β-Elemene	0.03	Sesquiterpene
β-Elemene	1.15	Sesquiterpene
Isocaryophyllene	0.03	Sesquiterpene
Cycloseychellene	0.67	Sesquiterpene
β-Caryophyllene	3.17	Sesquiterpene
Seychellene	6.86	Sesquiterpene
α-Guaiene	13.32	Sesquiterpene
Unknown	0.08	Sesquiterpene
Selina-5,11-diene	0.04	Sesquiterpene
α-Patchoulene	5.30	Sesquiterpene
α-Humulene	0.55	Sesquiterpene
Patchoulene analog I	1.73	Sesquiterpene
γ-Patchoulene	1.09	Sesquiterpene
9-epi-β-Caryophyllene	0.01	Sesquiterpene
Unknown	0.39	Sesquiterpene
Unknown	0.46	Sesquiterpene
Selina-4,11-diene	0.07	Sesquiterpene
β-Selinene	0.10	Sesquiterpene
Patchoulene analog II	0.26	Sesquiterpene
Unknown	0.30	Sesquiterpene
δ-Selinene	0.08	Sesquiterpene
Unknown	0.16	Sesquiterpene
α-Selinene	0.08	Sesquiterpene
Eudesma-2,4(15),11-triene	0.14	Sesquiterpene
Aciphyllene	2.79	Sesquiterpene
Pentadecane	0.12	Alkane
δ-Guaiene	15.98	Sesquiterpene
7-epi-α-Selinene	0.35	Sesquiterpene
Nootkatene	0.07	Sesquiterpene
Unknown	0.06	Sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene

Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.08	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Norpatchoulenol	0.60	Norsesquiterpenic alcohol
Unknown	0.04	Oxygenated sesquiterpene
Unknown	0.08	Oxygenated sesquiterpene
Unknown	0.19	Oxygenated sesquiterpene
Caryophyllene oxide	0.33	Sesquiterpenic ether
Caryophyllene oxide isomer	0.08	Sesquiterpenic ether
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.55	Oxygenated sesquiterpene
Unknown	0.13	Oxygenated sesquiterpene
Humulene epoxide II	0.06	Sesquiterpenic ether
Hexadecane	0.04	Alkane
Unknown	0.11	Oxygenated sesquiterpene
Unknown	0.28	Oxygenated sesquiterpene
Unknown	0.31	Oxygenated sesquiterpene
Caryophylladienol I	0.58	Sesquiterpenic alcohol
Hinesol	0.20	Sesquiterpenic alcohol
Patchoulol	31.43	Sesquiterpenic alcohol
Pogostol	1.95	Sesquiterpenic alcohol
Unknown	0.14	Oxygenated sesquiterpene
Unknown	0.06	Unknown
Unknown	0.04	Oxygenated sesquiterpene
Unknown	0.05	Oxygenated sesquiterpene
Pogostone	1.59	Terpenic lactone
Corymbolone analog	0.01	Sesquiterpenic alcohol
Corymbolone	0.02	Sesquiterpenic alcohol
Phytol	0.03	Diterpenic alcohol
Consolidated total	97.29%	

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

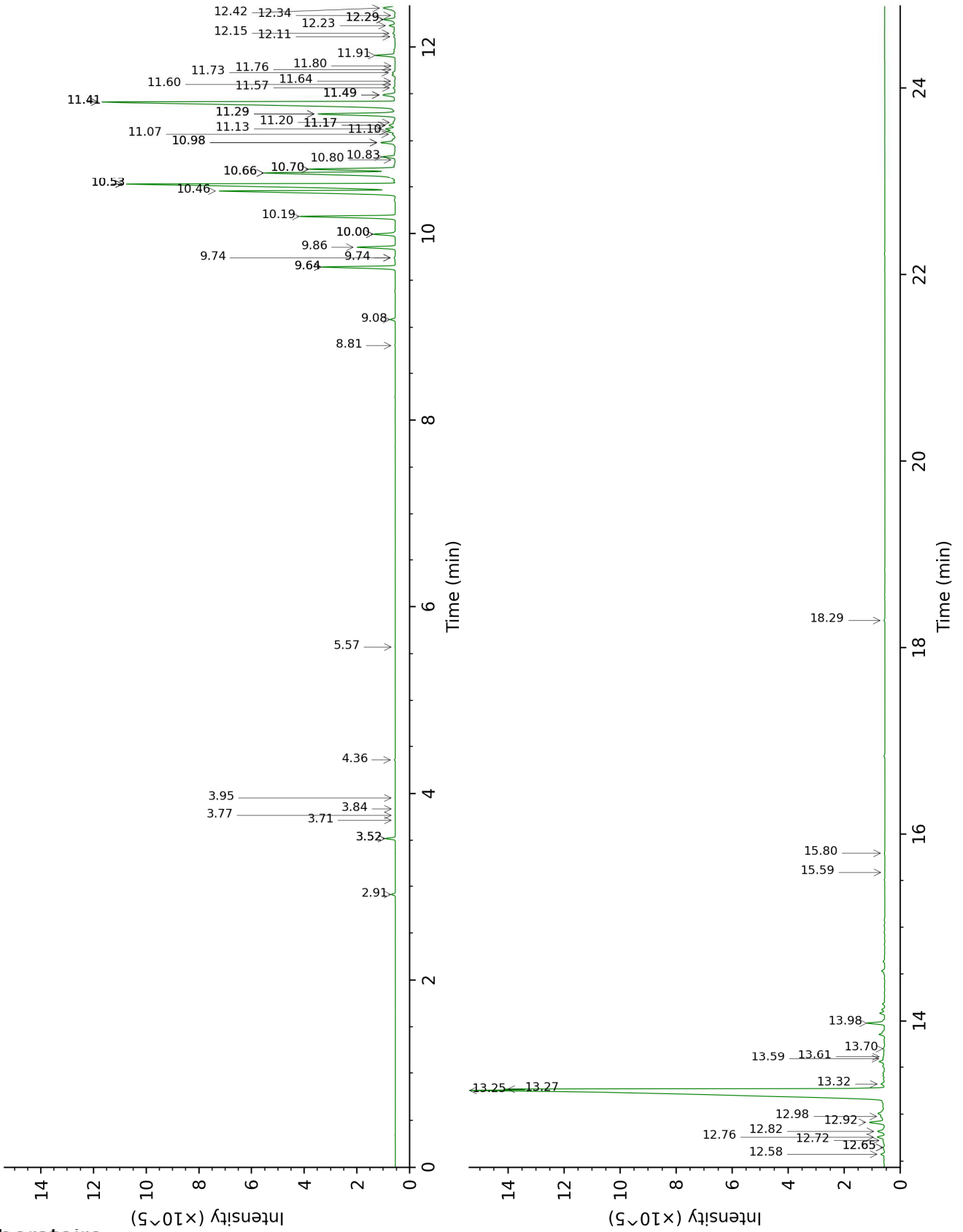
Note: no correction factor was applied

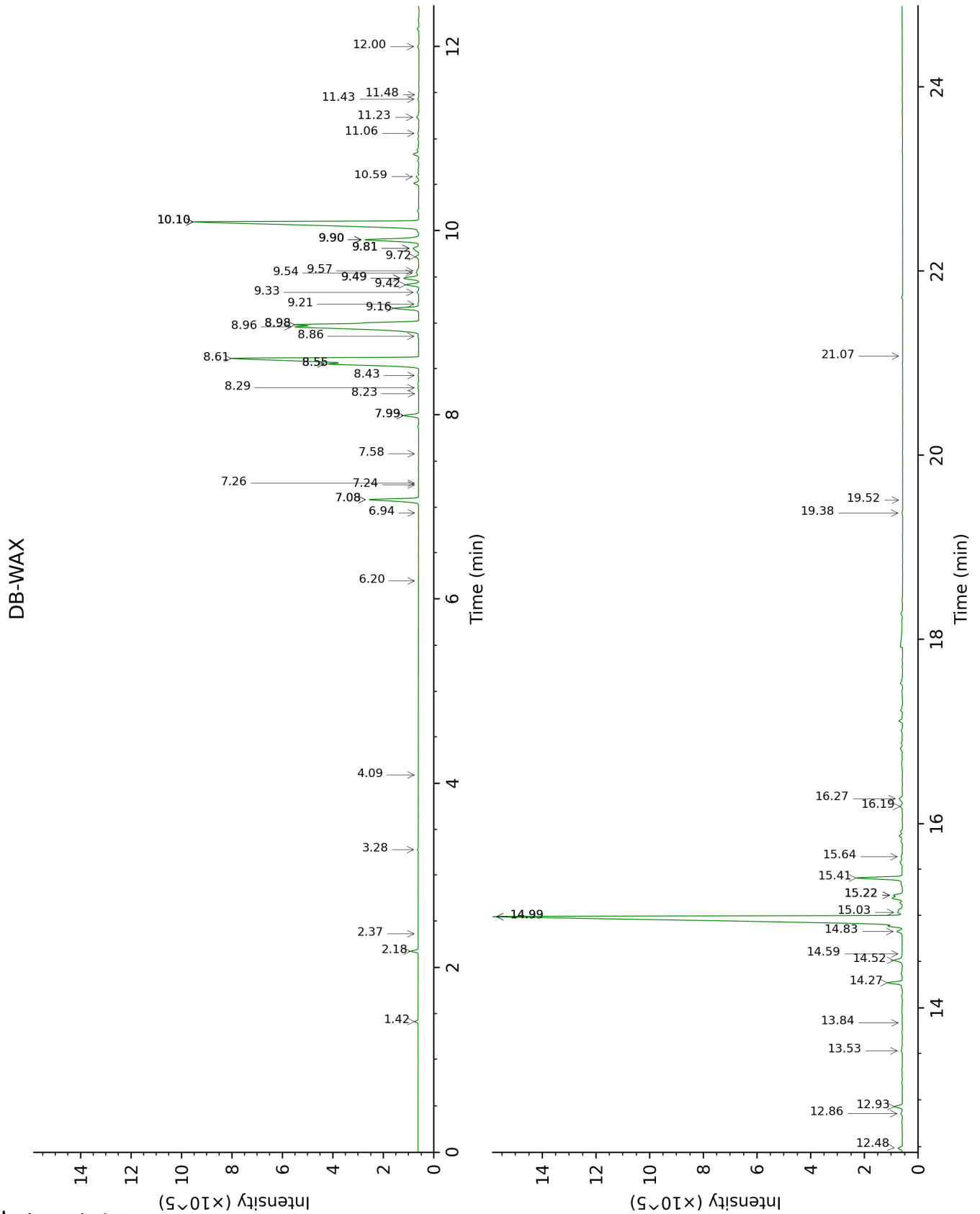
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm 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





FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
α-Pinene	2.91	930	0.11	1.42	990	0.11
β-Pinene	3.52*	971	0.26	2.18	1065	0.26
Sabinene	3.52*	971	[0.26]	2.36	1084	tr
Octen-3-ol	3.71	984	tr	6.94	1422	tr
Octan-3-one	3.77	988	tr	4.09	1220	tr
Myrcene	3.84	992	tr			
Octan-3-ol	3.95	1000	tr	6.20	1368	0.01
Limonene	4.36	1026	0.02	3.28	1157	0.02
Linalool	5.57	1102	0.01	8.23	1518	0.01
Unknown [m/z 159, 117 (68), 132 (55), 200 (35)]	8.81	1314	0.01	7.26	1445	0.01
δ-Elementene	9.08	1334	0.14	7.08*	1432	2.38
α-Copaene	9.64*	1374	2.26	7.24	1444	0.01
β-Patchoulene	9.64*	1374	[2.26]	7.08*	1432	[2.38]
1,5-diepi-β- Bourbonene	9.74*	1381	0.04	7.58	1469	0.02
cis-β-Elementene	9.74*	1381	[0.04]	8.43	1533	0.03
β-Elementene	9.86	1388	1.15	8.55*†	1542	17.63
Isocaryophyllene	10.00*	1398	0.70	8.29	1523	0.03
Cycloseychellene	10.00*	1398	[0.70]	7.99*	1500	0.66
β-Caryophyllene	10.18	1412	3.17	8.55*†	1542	[17.63]
Seychellene	10.46†	1432	20.75	8.96†	1574	13.88
α-Guaiene	10.53*†	1438	[20.75]	8.61†	1547	[17.63]
Unknown [m/z 91, 93 (98), 79 (82), 81 (82), 105 (71), 107 (70)... 204 (38)]	10.53*†	1438	[20.75]	9.33	1603	0.08
Selina-5,11-diene	10.53*†	1438	[20.75]	8.86	1566	0.04
α-Patchoulene	10.66*	1447	5.85	8.98*†	1576	[13.88]
α-Humulene	10.66*	1447	[5.85]	9.42	1610	0.55
Patchoulene analog I	10.70*	1450	2.81	8.98*†	1576	[13.88]
γ-Patchoulene	10.70*	1450	[2.81]	9.16	1589	1.09
9-epi-β- Caryophyllene	10.80	1458	0.01	9.54†	1620	[0.93]
Unknown [m/z 159, 91 (88), 93 (72), 79 (69), 105 (68), 41 (66), 81 (54), 202? (50)...]	10.83	1460	0.39	9.49*†	1616	0.93
Unknown [m/z 147, 93 (87), 107 (77), 105 (77), 91 (73), 79 (63)... 204 (21)]	10.98*	1471	0.53	9.49*†	1616	[0.93]
Selina-4,11-diene	10.98*	1471	[0.53]	9.57	1622	0.07

β-Selinene	11.07	1478	0.10	10.10*	1664	16.15
Patchoulene analog II	11.10	1480	0.26	9.90*	1649	2.85
Unknown [m/z 79, 107 (99), 91 (88), 93 (86), 81 (78), 105 (73), 41 (73)... 204? (12)]	11.13	1482	0.30	9.81*	1641	0.38
δ-Selinene	11.17*	1485	0.25	9.81*	1641	[0.38]
Unknown [m/z 161, 189 (96), 91 (74), 204 (73), 105 (69), 41 (52)]	11.17*	1485	[0.25]	9.90*	1649	[2.85]
α-Selinene	11.20	1487	0.08	10.10*	1664	[16.15]
Eudesma-2,4(15),11-triene	11.29*	1494	2.93	11.24	1759	0.14
Aciphyllene	11.29*	1494	[2.93]	9.90*	1649	[2.85]
Pentadecane	11.41*	1504	16.10	7.99*	1500	[0.66]
δ-Guaiene	11.41*	1504	[16.10]	10.10*	1664	[16.15]
7-epi-α-Selinene	11.49*	1510	0.49	10.59	1704	0.35
Nootkatene	11.49*	1510	[0.49]	11.06	1744	0.07
Unknown [m/z 159, 91 (81), 117 (68), 131 (51), 105 (46)... 202 (37)]	11.57	1515	0.06	9.72	1634	0.14
Unknown [m/z 41, 67 (95), 93 (92), 107 (91), 55 (77), 81 (77), 79 (73)... 205 (17)...]	11.60	1518	0.02	11.48	1779	0.02
Unknown [m/z 161, 119 (92), 91 (69), 105 (52), 145 (49)... 218 (6)]	11.64	1521	0.02	11.43	1775	0.05
Unknown [m/z 91, 105 (98), 108 (83), 93 (82), 133 (79), 77 (64), 79 (57), 41 (56), 145 (55)... 218? (5)]	11.73	1528	0.08			
Unknown [m/z 91, 105 (78), 93 (77), 107 (71), 79 (64), 41 (63), 77 (63), 145 (60)... 218 (17)]	11.76	1531	0.01			
Unknown [m/z 145, 131 (91), 91 (86), 105 (68), 146 (66), 43 (54)... 220? (5)]	11.80	1534	0.01			
Norpatchoulenol	11.91	1543	0.60	14.27	2030	0.62

Unknown [m/z 191, 159 (66), 133 (53), 91 (45), 41 (42), 177 (35), 105 (33), 220 (32)]	12.11	1558	0.04	13.84	1989	0.01
Unknown [m/z 41, 67 (90), 55 (87), 79 (85), 107 (84), 81 (84), 93 (84), 121 (77), 91 (74)... 220 (7)]	12.15	1561	0.08			
Unknown [m/z 43, 107 (94), 81 (71), 41 (63), 67 (58), 111 (58), 93 (55), 83 (54)... 205 (8), 220 (1)]	12.23	1568	0.19	12.48	1867	0.18
Caryophyllene oxide	12.30*	1573	0.40	12.93	1906	0.33
Caryophyllene oxide isomer	12.30*	1573	[0.40]	12.86	1900	0.08
Unknown isomer	12.34	1576	0.02	14.58	2060	0.02
Unknown [m/z 43, 79 (44), 81 (41), 93 (40), 91 (40)... 220 (5)]	12.42	1582	0.55	14.52	2053	0.44
Unknown [m/z 43, 105 (77), 91 (71), 93 (68), 41 (62), 107 (6)... 205 (41), 220 (7)]	12.58	1595	0.13	14.83	2083	0.25
Humulene epoxide II	12.65*	1600	0.09	13.53	1961	0.06
Hexadecane	12.65*	1600	[0.09]	9.21	1593	0.04
Unknown [m/z 43, 161 (73), 91 (53), 95 (52), 79 (46), 119 (45)... 205 (29), 220? (1)]	12.72	1606	0.11	14.99*†	2099	31.82
Unknown [m/z 41, 91 (92), 55 (81), 93 (81), 79 (74), 43 (71), 95 (68), 123 (65)... 220 (17)]	12.76	1609	0.28	15.03†	2104	[31.82]
Unknown [m/z 43, 79 (41), 93 (39), 41 (39), 91 (38), 81 (36)... 220 (3)]	12.82	1614	0.31			
Caryophylladienol I	12.92	1622	0.58	16.19	2219	0.10

Hinesol	12.98	1628	0.20	15.22*†	2122	0.84
Patchoulol	13.25†	1650	33.58	14.99*†	2099	[31.82]
Pogostol	13.27†	1651	[33.58]	15.41	2140	1.95
Unknown [m/z 175, 218 (59), 133 (49), 91 (43), 41 (38), 147 (36)]	13.32	1656	0.14	15.22*†	2122	[0.84]
Unknown [m/z 111, 250 (38), 126 (27), 139 (26), 43 (16), 41 (15), 166 (15)]	13.59	1678	0.06	12.00	1824	0.07
Unknown [m/z 91, 41 (100), 107 (98), 108 (95), 95 (87), 93 (87), 105 (85), 79 (77), 119 (72)... 220? (15)]	13.61	1680	0.04	16.27	2227	0.19
Unknown [m/z 43, 41 (95), 97 (89), 109 (71), 55 (71), 107 (70), 95 (69), 110 (65)... 222 (5)]	13.70	1687	0.05	15.64	2164	0.08
Pogostone	13.98	1710	1.59			
Corymbolone analog	15.59	1853	0.01	19.38	2563	0.04
Corymbolone	15.80	1871	0.02	21.07	2764	0.01
Phytol	18.29	2112	0.03	19.52	2579	0.01
Total identified		95.12%			93.55%	
Total reported		98.01%			95.10%	

*: 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