Date : October 06, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21J04-PTH04
Customer identification : Myrrh - France - M40111213R
Type : Essential oil
Source : *Commiphora myrrha*
Customer : Plant Therapy

Analysis

Method: PC-MAT-014 ISO - Analysis of the composition of an essential oil or other volatile liquid by FAST GC-FID (in French); identifications validated by GC-MS.
Analyst : Sarah-Eve Tremblay, M. Sc. A., Chimiste
Analysis date : October 05, 2021

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Orange viscous liquid
Refractive index: 1.5273 ± 0.0003 (20 °C; method PC-MAT-016)

CONCLUSION

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

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Analysis summary – Consolidated contents

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

Identification	%	Class
para-Xylene	0.01	Simple phenolic
α-Thujene	0.01	Monoterpene
α-Pinene	0.03	Monoterpene
β-Pinene	tr	Monoterpene
Sabinene	tr	Monoterpene
Myrcene	0.01	Monoterpene
Δ3-Carene	0.01	Monoterpene
para-Cymene	0.01	Monoterpene
Limonene	0.01	Monoterpene
(*E*)-β-Ocimene	0.04	Monoterpene
Terpinen-4-ol	tr	Monoterpenic alcohol
δ-Elemene isomer	0.02	Sesquiterpene
δ-Elemene	0.71	Sesquiterpene
α-Cubebene	0.04	Sesquiterpene
α-Ylangene	0.02	Sesquiterpene
α-Copaene	0.11	Sesquiterpene
β-Bourbonene	0.29	Sesquiterpene
cis-β-Elemene	0.09	Sesquiterpene
β-Elemene	3.21	Sesquiterpene
Cyperene	0.09	Sesquiterpene
α-Gurjunene	0.03	Sesquiterpene
β-Caryophyllene	0.43	Sesquiterpene
cis-α-Bergamotene	0.06	Sesquiterpene
β-Copaene	0.10	Sesquiterpene
γ-Elemene	0.44	Sesquiterpene
trans-α-Bergamotene	0.04	Sesquiterpene
Isogermacrene D	0.08	Sesquiterpene
α-Humulene	0.23	Sesquiterpene
allo-Aromadendrene	0.02	Sesquiterpene
4,5-diepi-Aristolochene	0.04	Sesquiterpene
trans-Cadina-1(6),4-diene	0.06	Sesquiterpene
γ-Muurolene	0.15	Sesquiterpene
Selina-4,11-diene	0.04	Sesquiterpene
Germacrene D	0.83	Sesquiterpene
β-Selinene	0.53	Sesquiterpene
δ-Selinene	0.05	Sesquiterpene
α-Selinene	0.58	Sesquiterpene
Curzerene	18.25	Sesquiterpenic ether
ε-Amorphene	0.28	Sesquiterpene
δ-Amorphene	0.08	Sesquiterpene
δ-Guaiene	0.05	Sesquiterpene
γ-Cadinene	0.33	Sesquiterpene
δ-Cadinene	0.21	Sesquiterpene
trans-Calamenene	0.01	Sesquiterpene
Selina-4(15),7(11)-diene	0.13	Sesquiterpene

Selina-4,7(11)-diene?	0.22	Sesquiterpene
Selina-3,7(11)-diene	0.04	Sesquiterpene
α-Elemol	0.12	Sesquiterpenic alcohol
Germacrene B	2.08	Sesquiterpene
1,5-Epoxysalvial-4(14)-ene	0.03	Sesquiterpenic ether
Furanoeudesma-1,4-diene	0.53	Sesquiterpenic ether
Viridiflorol	0.03	Sesquiterpenic alcohol
Unknown	0.04	Oxygenated sesquiterpene
β-Elemenone	0.20	Sesquiterpenic ketone
Curzerenone	0.18	Sesquiterpenic ketone
Unknown	0.02	Oxygenated sesquiterpene
Selin-6-en-4α-ol isomer	0.08	Sesquiterpenic alcohol
Furanoeudesma-1,3-diene	34.95	Sesquiterpenic ether
Alismol?	0.29	Oxygenated sesquiterpene
Lindestrene	10.94	Sesquiterpenic ether
τ-Muurolol	0.01	Sesquiterpenic alcohol
τ-Cadinol	0.70	Sesquiterpenic alcohol
α-Muurolol	0.14	Sesquiterpenic alcohol
α-Eudesmol	0.09	Sesquiterpenic alcohol
Furanodiene	0.61	Sesquiterpenic ether
Atractylone?	0.80	Sesquiterpenic ether
Unknown	0.10	Unknown
α-Elemyl acetate	1.32	Sesquiterpenic ester
Unknown	4.99	Oxygenated sesquiterpene
Germacrone	0.60	Sesquiterpenic ketone
Unknown	0.02	Oxygenated sesquiterpene
Aromadendrane-4,10-diol	0.17	Sesquiterpenic alcohol
2-Methoxyfuranodiene	3.75	Sesquiterpenic ether
Unknown	0.06	Unknown
Unknown	0.15	Sesquiterpenic ester
Unknown	0.15	Sesquiterpenic ester
Isofuranodienone	0.12	Sesquiterpenic ketone
2-Acetoxyfuranodiene?	0.68	Sesquiterpenic ester
Myrrhanolide C?	0.08	Sesquiterpenic alcohol
Unknown	0.11	Unknown
Cembrenol	0.01	Diterpenic alcohol
Consolidated total	**92.15%**	

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.

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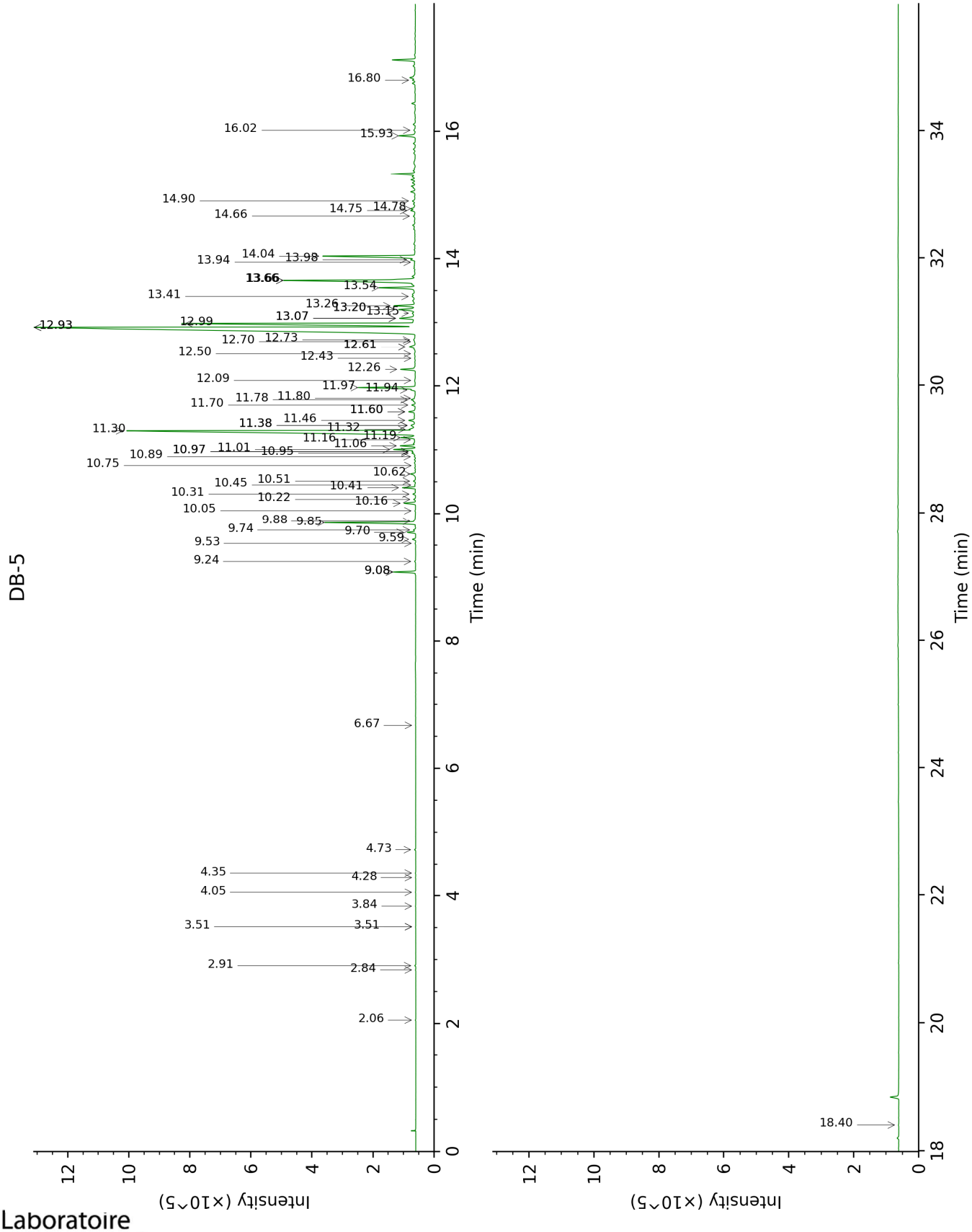
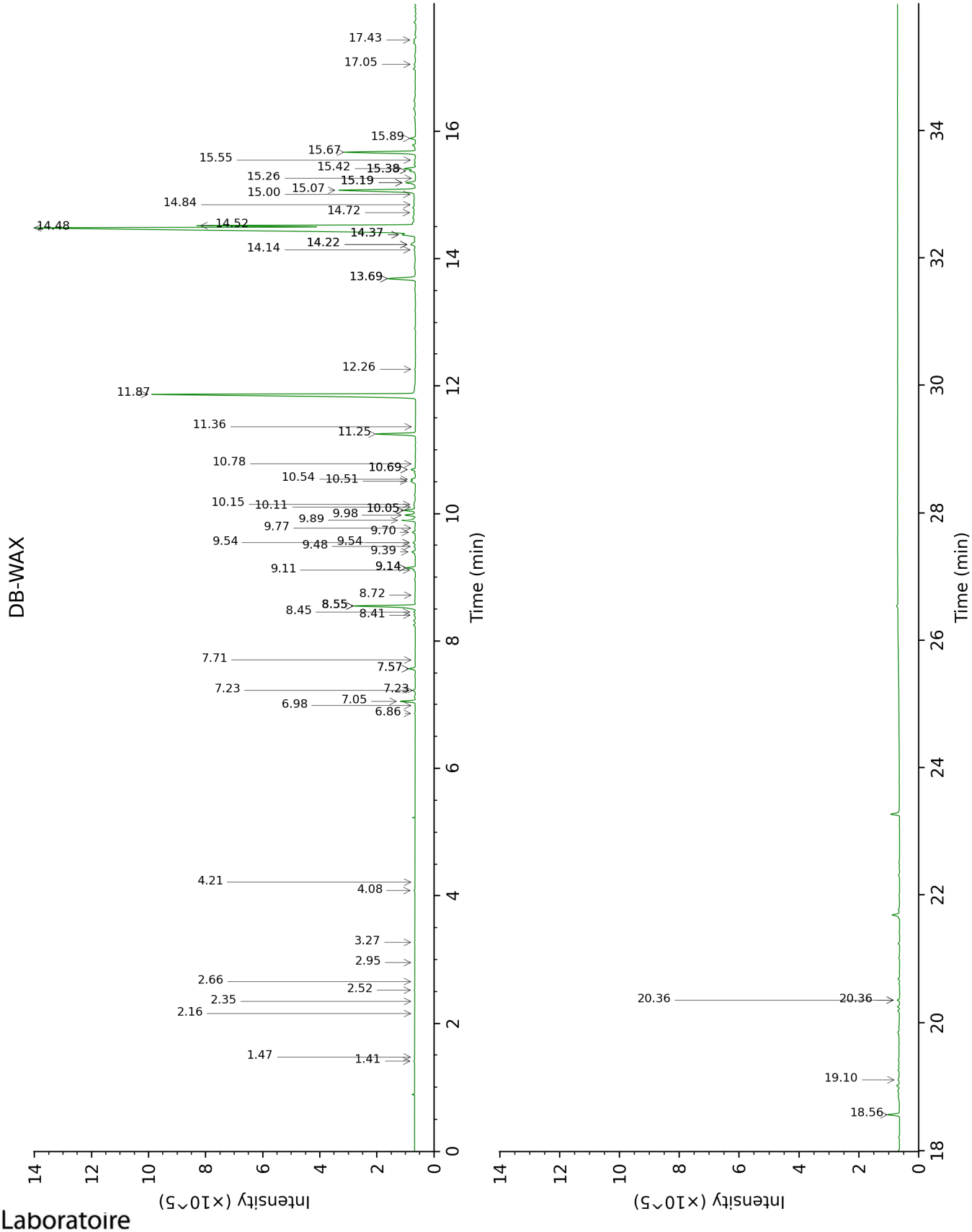

DB-5
16.80
16.02
15.93
14.90
14.66
14.75
14.78
13.94
14.04
13.98
13.66
13.54
13.41
13.26
13.20
13.15
13.07
12.93
12.99
12.70
12.73
12.61
12.50
12.43
12.26
12.09
11.97
11.94
11.70
11.78
11.80
11.60
11.30
11.38
11.46
11.32
11.16
11.19
11.06
10.89
10.97
11.01
10.95
10.75
10.62
10.45
10.51
10.41
10.31
10.22
10.16
10.05
9.88
9.85
9.74
9.70
9.59
9.53
9.24
9.08
6.67
4.73
4.35
4.28
4.05
3.84
3.51
3.51
2.91
2.84
2.06
18.40
Time (min)
Intensity (×10^5)


DB-WAX
17.43
17.05
15.89
15.67
15.55
15.42
15.38
15.26
15.19
15.00
15.07
14.84
14.72
14.48
14.52
14.37
14.14
14.22
13.69
12.26
11.87
11.36
11.25
10.78
10.69
10.54
10.51
10.15
10.11
10.05
9.89
9.98
9.77
9.70
9.54
9.48
9.54
9.39
9.11
9.14
8.72
8.45
8.55
8.41
7.71
7.57
7.23
7.23
6.98
7.05
6.86
4.21
4.08
3.27
2.95
2.66
2.52
2.35
2.16
1.47
1.41
20.36
20.36
19.10
18.56
Time (min)
Intensity (×10^5)

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
para-Xylene	2.06	863	0.01	2.52	1097	0.01
α-Thujene	2.84	925	0.01	1.47	995	0.01
α-Pinene	2.91	930	0.03	1.40	988	0.03
β-Pinene	3.51*	971	0.01	2.16	1063	tr
Sabinene	3.51*	971	[0.01]	2.35	1082	tr
Myrcene	3.84	992	0.01	2.95	1131	0.01
Δ3-Carene	4.05	1007	0.01	2.66	1108	0.01
para-Cymene	4.28	1021	0.01	4.21	1228	0.01
Limonene	4.35	1026	0.01	3.27	1156	0.01
(*E*)-β-Ocimene	4.73	1049	0.04	4.08	1219	0.04
Terpinen-4-ol	6.67	1173	tr	8.72	1555	0.02
δ-Elemene isomer	9.08*	1334	0.73	6.98	1425	0.02
δ-Elemene	9.08*	1334	[0.73]	7.05	1429	0.71
α-Cubebene	9.24	1345	0.04	6.86	1416	0.04
α-Ylangene	9.53	1365	0.02	7.23*	1443	0.12
α-Copaene	9.59	1370	0.11	7.23*	1443	[0.12]
β-Bourbonene	9.70	1378	0.29	7.57*	1468	0.32
cis-β-Elemene	9.74	1380	0.09	8.45	1535	0.08
β-Elemene	9.85	1388	3.21	8.55*	1542	3.53
Cyperene	9.88	1390	0.09	7.57*	1468	[0.32]
α-Gurjunene	10.05	1402	0.03	7.70	1478	0.02
β-Caryophyllene	10.16	1411	0.43	8.55*	1542	[3.53]
cis-α-Bergamotene	10.22	1415	0.06	8.41	1531	0.07
β-Copaene	10.31	1421	0.10	8.55*	1542	[3.53]
γ-Elemene	10.41	1429	0.44	9.14*	1588	0.45
trans-α-Bergamotene	10.45	1432	0.04	8.55*	1542	[3.53]
Isogermacrene D	10.51	1436	0.08	9.11	1585	0.09
α-Humulene	10.62	1445	0.23	9.39	1608	0.20
allo-Aromadendrene	10.75	1454	0.02	9.14*	1588	[0.45]
4,5-diepi-Aristolochene	10.89	1465	0.04	9.54*	1620	0.14
trans-Cadina-1(6),4-diene	10.95†	1469	0.26	9.48	1615	0.06
γ-Muurolene	10.97*†	1471	[0.26]	9.70	1633	0.15
Selina-4,11-diene	10.97*†	1471	[0.26]	9.54*	1620	[0.14]
Germacrene D	11.01	1473	0.83	9.89	1648	0.88
β-Selinene	11.06	1478	0.53	9.98	1655	0.54
δ-Selinene	11.16	1484	0.05	9.77	1638	0.04
α-Selinene	11.19	1487	0.58	10.05*	1661	0.63
Curzerene	11.30	1495	18.25	11.87	1813	18.54
ε-Amorphene	11.32	1496	0.28	10.15	1668	0.11
δ-Amorphene	11.38*	1501	0.27	10.10	1665	0.08
δ-Guaiene	11.38*	1501	[0.27]	10.05*	1661	[0.63]
γ-Cadinene	11.46	1507	0.33	10.51	1698	0.33
δ-Cadinene	11.60*	1518	0.29	10.54	1701	0.21
trans-Calamenene	11.60*	1518	[0.29]	11.36	1769	0.01

Selina-4(15),7(11)-diene	11.70	1526	0.13	10.78	1721	0.04
Selina-4,7(11)-diene?	11.78	1533	0.22	10.69*	1713	0.25
Selina-3,7(11)-diene	11.80	1534	0.04	10.69*	1713	[0.25]
α-Elemol	11.94	1545	0.12	14.22*	2026	0.32
Germacrene B	11.97	1547	2.08	11.25	1760	2.09
1,5-Epoxysalvial-4(14)-ene	12.08	1556	0.03	12.26	1847	0.03
Furanoeudesma-1,4-diene	12.26	1570	0.53	13.69*	1975	1.82
Viridiflorol	12.43	1583	0.03	14.14	2018	0.07
Unknown [m/z 43, 119 (94), 93 (68), 105 (64), 91 (60), 162 (59), 147 (59)... 220 (9)]	12.50	1589	0.04	14.37*†	2040	[48.28]
β-Elemenone	12.61*	1598	0.35	14.22*	2026	[0.32]
Curzerenone	12.61*	1598	[0.35]	15.38*	2138	0.32
Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)]	12.70	1605	0.02	14.72	2073	0.13
Selin-6-en-4α-ol isomer	12.73	1607	0.08	15.00	2100	0.13
Furanoeudesma-1,3-diene	12.92*	1623	35.24	14.48†	2050	48.28
Alismol?	12.92*	1623	[35.24]	15.89	2188	0.29
Lindestrene	12.99	1628	10.94	14.52†	2053	[48.28]
τ-Muurolol	13.07*	1635	0.70	15.26	2125	0.01
τ-Cadinol	13.07*	1635	[0.70]			
α-Muurolol	13.15	1641	0.14	15.38*	2138	[0.32]
α-Eudesmol	13.20*	1646	0.70	15.55	2154	0.09
Furanodiene	13.20*	1646	[0.70]	14.37*†	2040	[48.28]
Atractylone?	13.26	1651	0.80			
Unknown [m/z 43, 93 (76), 161 (76), 121 (51), 107 (51), 81 (38), 105 (37)...]	13.41	1663	0.10			
α-Elemyl acetate	13.54	1674	1.32	13.69*	1975	[1.82]
Unknown [m/z 108, 216 (29), 93 (26), 109 (21), 91 (21)]	13.66*	1684	6.35	15.07	2107	4.99
Germacrone	13.66*	1684	[6.35]	15.42	2141	0.60
Unknown [m/z 93, 81 (90), 95 (86), 91 (83), 41 (83), 107 (81)... 220 (29), 238? (4)]	13.94	1707	0.02	17.43	2348	0.15
Aromadendrane-4,10-diol	13.98	1711	0.17	17.05	2307	0.10
2-Methoxyfuranodiene	14.04	1716	3.75	15.67	2166	3.85
Unknown [m/z 161, 189 (92), 204 (80), 43	14.66	1770	0.06	14.84	2084	0.05

(35), 133 (31), 105 (29)...]						
Unknown [m/z 161, 189 (59), 204 (54), 43 (50), 107 (28), 149 (24), 122 (24)...]	14.75	1777	0.15	15.18*	2118	0.60
Unknown [m/z 161, 43 (96), 204 (71), 189 (53), 105 (34), 133 (32), 91 (29)...]	14.78	1780	0.15	15.18*	2118	[0.60]
Isofuranodienone	14.90	1790	0.12			
2-Acetoxyfuranodiene?	15.93	1883	0.68	18.56	2471	0.62
Myrrhanolide C?	16.02	1891	0.08	19.10	2532	0.11
Unknown [m/z 197, 108 (83), 212 (50), 43 (42), 169 (38), 183 (31), 155 (30), 79 (26), 105 (26)]	16.80	1965	0.11	20.36*	2678	0.13
Cembrenol	18.40	2123	0.01	20.36*	2678	[0.13]
Total identified		**92.45%**			**87.24%**	
Total reported		**93.10%**			**92.57%**	

*: 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