Date : April 19, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21D15-PTH03
Customer identification : Myrrh - France - M40110211R
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 : April 16, 2021

Checked and approved by :

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

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia. This report is digitally signed, it is only considered valid if the digital signature is intact. The results only describe the samples that were submitted to the assays.

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PHYSICOCHEMICAL DATA

Physical aspect: Orange viscous liquid
Refractive index: 1.5275 ± 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
Camphene	tr	Monoterpene
Sabinene	tr	Monoterpene
β-Pinene	tr	Monoterpene
Myrcene	0.01	Monoterpene
Δ3-Carene	0.01	Monoterpene
para-Cymene	0.01	Monoterpene
Limonene	0.01	Monoterpene
(*Z*)-β-Ocimene	tr	Monoterpene
(*E*)-β-Ocimene	0.04	Monoterpene
Terpinolene	tr	Monoterpene
Terpinen-4-ol	0.01	Monoterpenic alcohol
α-Terpineol	tr	Monoterpenic alcohol
3,5-Dimethoxytoluene	tr	Simple phenolic
δ-Elemene isomer	0.02	Sesquiterpene
δ-Elemene	0.75	Sesquiterpene
α-Cubebene	0.12	Sesquiterpene
α-Ylangene	0.03	Sesquiterpene
β-Bourbonene	0.29	Sesquiterpene
cis-β-Elemene	0.09	Sesquiterpene
β-Elemene	3.26	Sesquiterpene
β-Caryophyllene	0.09	Sesquiterpene
cis-α-Bergamotene	0.03	Sesquiterpene
α-Santalene	0.06	Sesquiterpene
β-Copaene	0.11	Sesquiterpene
γ-Elemene	0.45	Sesquiterpene
trans-α-Bergamotene	0.03	Sesquiterpene
Isogermacrene D	0.10	Sesquiterpene
α-Humulene	0.19	Sesquiterpene
4,5-diepi-Aristolochene	0.03	Sesquiterpene
trans-Cadina-1(6),4-diene	0.04	Sesquiterpene
Selina-4,11-diene	0.13	Sesquiterpene
γ-Muurolene	0.10	Sesquiterpene
α-Amorphene	0.01	Sesquiterpene
Germacrene D	0.84	Sesquiterpene
β-Selinene	0.53	Sesquiterpene
δ-Selinene	0.02	Sesquiterpene
α-Selinene	0.48	Sesquiterpene
Bicyclogermacrene	0.13	Sesquiterpene
Curzerene	18.68	Sesquiterpenic ether
Germacrene A	0.24	Sesquiterpene
ε-Amorphene	0.19	Sesquiterpene
δ-Amorphene	0.17	Sesquiterpene

γ-Cadinene	0.24	Sesquiterpene
(*Z*)-γ-Bisabolene	0.03	Sesquiterpene
δ-Cadinene	0.26	Sesquiterpene
Selina-4(15),7(11)-diene	0.13	Sesquiterpene
Unknown	0.06	Sesquiterpene
Selina-3,7(11)-diene	0.12	Sesquiterpene
α-Elemol	0.16	Sesquiterpenic alcohol
Germacrene B	2.10	Sesquiterpene
Furanoeudesma-1,4-diene	0.53	Sesquiterpenic ether
Viridiflorol	0.16	Sesquiterpenic alcohol
β-Elemenone	0.41	Sesquiterpenic ketone
Selin-6-en-4α-ol isomer	0.08	Sesquiterpenic alcohol
Furanoeudesma-1,3-diene	35.07	Sesquiterpenic ether
Alismol	0.31	Sesquiterpenic alcohol
Lindestrene	10.77	Sesquiterpenic ether
τ-Cadinol	0.20	Sesquiterpenic alcohol
τ-Muurolol	0.53	Sesquiterpenic alcohol
α-Muurolol	0.07	Sesquiterpenic alcohol
Furanodiene	0.59	Sesquiterpenic ether
α-Eudesmol	0.08	Sesquiterpenic alcohol
Isofuranogermacrene	0.77	Sesquiterpenic ether
α-Elemyl acetate	1.36	Sesquiterpenic ester
Germacrone	0.61	Sesquiterpenic ketone
Methoxyfuranodiene analog	5.37	Sesquiterpenic ether
Aromadendrane-4,10-diol	0.20	Sesquiterpenic alcohol
2-Methoxyfuranodiene	3.79	Sesquiterpenic ether
2-Acetoxyfuranodiene?	0.68	Sesquiterpenic ester
Myrrhanolide C?	0.04	Sesquiterpenic alcohol
Unknown	0.13	Unknown
Cembrenol	0.02	Diterpenic alcohol
Serratol	0.01	Diterpenic alcohol
Consolidated total	**92.28%**	

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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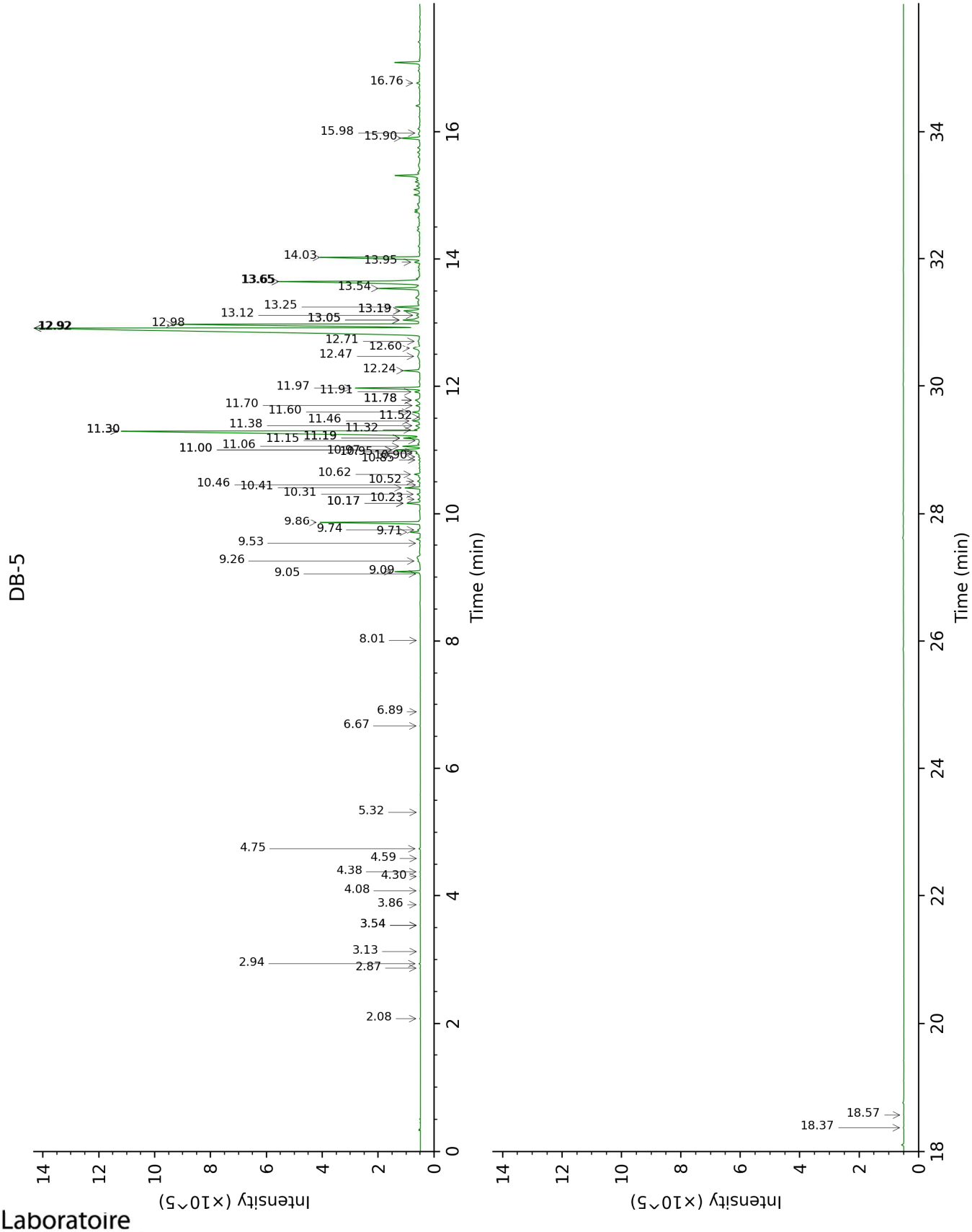
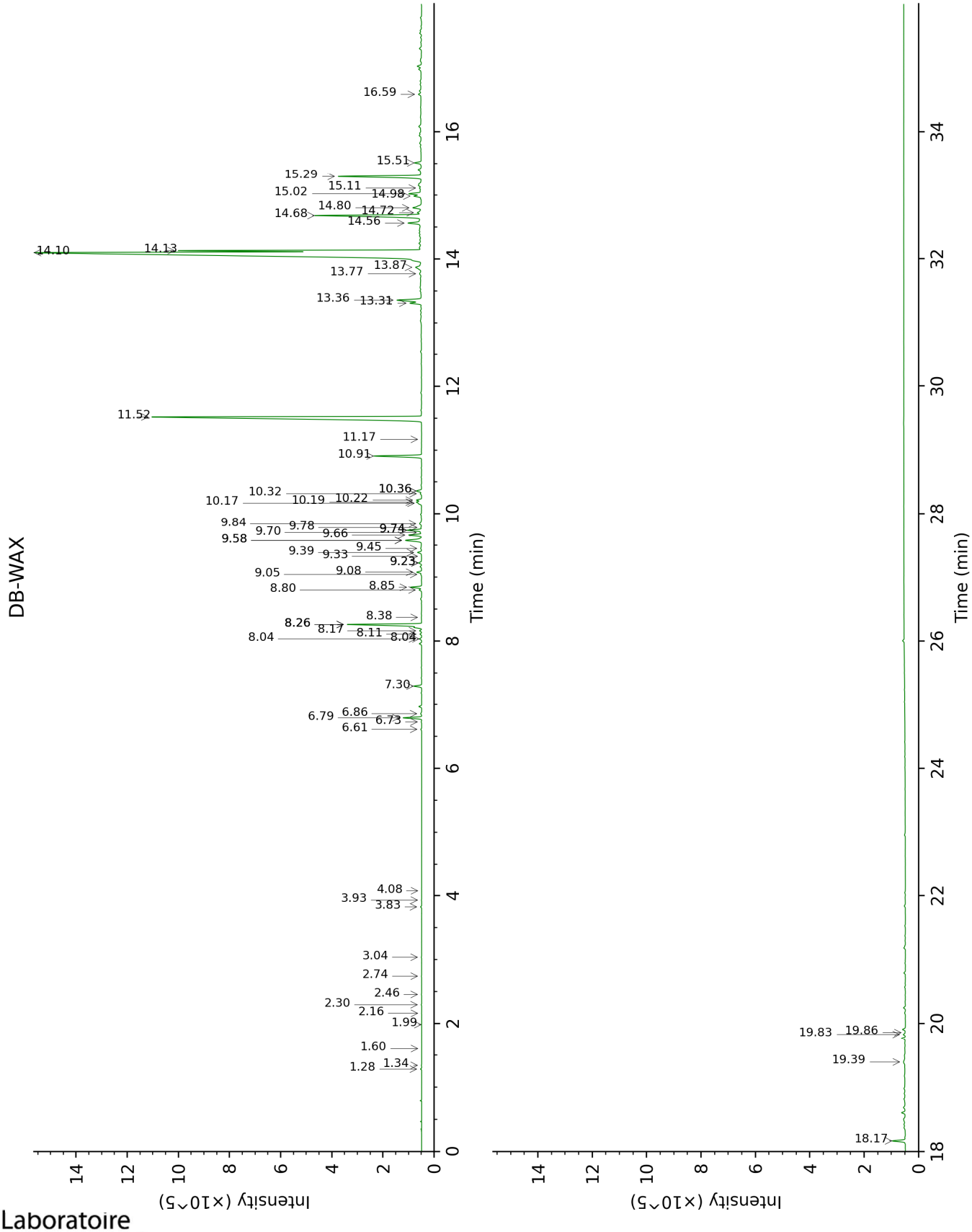

DB-5
16.76
15.98
15.90
14.03
13.95
13.65
13.54
13.25
13.19
13.12
13.05
12.98
12.92
12.71
12.60
12.47
12.24
11.97
11.91
11.78
11.70
11.60
11.52
11.46
11.38
11.32
11.30
11.19
11.15
11.06
11.00
10.85
10.62
10.52
10.46
10.41
10.31
10.23
10.17
9.86
9.74
9.71
9.53
9.26
9.09
9.05
8.01
6.89
6.67
5.32
4.75
4.59
4.38
4.30
4.08
3.86
3.54
3.13
2.94
2.87
2.08
18.57
18.37
Time (min)
Intensity (×10^5)


DB-WAX
Intensity (×10^5)
Time (min)
16.59
15.51
15.29
15.02
15.11
14.98
14.80
14.72
14.68
14.56
14.10
14.13
13.77
13.87
13.36
13.31
11.52
11.17
10.91
10.32
10.36
10.17
10.19
10.22
9.84
9.78
9.70
9.66
9.74
9.58
9.39
9.33
9.45
9.23
9.05
9.08
8.80
8.85
8.38
8.26
8.17
8.11
8.04
8.04
7.30
6.79
6.86
6.73
6.61
4.08
3.93
3.83
3.04
2.74
2.46
2.30
2.16
1.99
1.60
1.28
1.34
19.83
19.86
19.39
18.17

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
para-Xylene	2.08	865	0.01	2.30	1098	0.01
α-Thujene	2.87	927	0.01	1.34	1001	0.01
α-Pinene	2.94	932	0.03	1.28	992	0.03
Camphene	3.13	944	tr	1.60	1027	tr
Sabinene	3.54*	972	0.01	2.16	1084	tr
β-Pinene	3.54*	972	[0.01]	1.99	1066	tr
Myrcene	3.86	994	0.01	2.74	1134	0.01
Δ3-Carene	4.08	1008	0.01	2.46	1111	0.01
para-Cymene	4.30	1023	0.01	3.93	1227	0.01
Limonene	4.38	1027	0.01	3.04	1157	0.01
(*Z*)-β-Ocimene	4.60	1041	tr			
(*E*)-β-Ocimene	4.75	1051	0.04	3.83	1219	0.04
Terpinolene	5.32	1087	tr	4.08	1238	tr
Terpinen-4-ol	6.67	1174	0.01	8.38	1555	0.01
α-Terpineol	6.89	1188	tr	9.58*	1652	0.91
3,5-Dimethoxytoluene	8.01	1263	tr	11.17	1785	tr
δ-Elemene isomer	9.06	1334	0.02	6.73	1430	0.02
δ-Elemene	9.09	1336	0.75	6.79	1434	0.73
α-Cubebene	9.26	1348	0.12	6.61	1421	0.03
α-Ylangene	9.53	1368	0.03	6.86	1439	0.05
β-Bourbonene	9.71	1380	0.29	7.30	1472	0.33
cis-β-Elemene	9.74	1383	0.09	8.11	1534	0.07
β-Elemene	9.86	1391	3.26	8.26*	1546	3.38
β-Caryophyllene	10.17*	1413	0.44	8.26*	1546	[3.38]
cis-α-Bergamotene	10.17*	1413	[0.44]	8.04*	1529	0.10
α-Santalene	10.23	1418	0.06	8.04*	1529	[0.10]
β-Copaene	10.31	1424	0.11	8.17	1539	0.09
γ-Elemene	10.41	1431	0.45	8.85	1592	0.46
trans-α-Bergamotene	10.46	1435	0.03	8.26*	1546	[3.38]
Isogermacrene D	10.52	1439	0.10	8.80	1589	0.11
α-Humulene	10.62	1447	0.19	9.08	1611	0.21
4,5-diepi-Aristolochene	10.85	1464	0.03	9.23*	1623	0.13
trans-Cadina-1(6),4-diene	10.90	1468	0.04	9.05	1608	0.03
Selina-4,11-diene	10.95	1472	0.13	9.23*	1623	[0.13]
γ-Muurolene	10.97	1473	0.10	9.39	1636	0.17
α-Amorphene	11.00*	1476	0.85	9.33	1631	0.01
Germacrene D	11.00*	1476	[0.85]	9.58*	1652	[0.91]
β-Selinene	11.06	1480	0.53	9.66	1658	0.54
δ-Selinene	11.15	1487	0.02	9.45	1641	0.03
α-Selinene	11.19*	1490	0.61	9.74*	1664	0.61
Bicyclogermacrene	11.19*	1490	[0.61]	9.84	1673	0.13
Curzerene	11.30*	1498	18.25	11.52	1816	18.68
Germacrene A	11.30*	1498	[18.25]	10.19	1701	0.24
ε-Amorphene	11.32	1499	0.19	9.78	1668	0.03
δ-Amorphene	11.38	1504	0.17	9.70	1661	0.04

γ-Cadinene	11.46	1510	0.24	10.17	1700	0.11
(*Z*)-γ-Bisabolene	11.52	1514	0.03	9.74*	1664	[0.61]
δ-Cadinene	11.60	1521	0.26	10.22	1704	0.22
Selina-4(15),7(11)-diene	11.70	1529	0.13	10.36*	1716	0.26
Unknown [m/z 189, 204 (92), 161 (65), 133 (51), 105 (51), 91 (51), 119 (45)]	11.78*	1535	0.19	10.32	1712	0.06
Selina-3,7(11)-diene	11.78*	1535	[0.19]	10.36*	1716	[0.26]
α-Elemol	11.91	1546	0.16	13.87	2032	0.39
Germacrene B	11.97	1550	2.10	10.91	1763	2.18
Furanoeudesma-1,4-diene	12.24	1572	0.53	13.31	1978	0.52
Viridiflorol	12.47	1589	0.16	13.77	2022	0.07
β-Elemenone	12.60	1599	0.41			
Selin-6-en-4α-ol isomer	12.71	1609	0.08	14.56	2099	0.64
Furanoeudesma-1,3-diene	12.92*	1626	35.37	14.10†	2054	48.42
Alismol	12.92*	1626	[35.37]	15.51	2195	0.31
Lindestrene	12.98	1631	10.77	14.13†	2057	[48.42]
τ-Cadinol	13.05*	1636	0.56	14.72	2115	0.20
τ-Muurolol	13.05*	1636	[0.56]	14.80	2123	0.53
α-Muurolol	13.12	1643	0.07	14.98	2141	0.34
Furanodiene	13.19*	1648	0.68			
α-Eudesmol	13.19*	1648	[0.68]	15.11	2154	0.08
Isofuranogermacrene	13.25	1653	0.77			
α-Elemyl acetate	13.54	1677	1.36	13.36	1983	1.33
Germacrone	13.65*	1686	6.53	15.02	2145	0.61
Methoxyfuranodiene analog	13.65*	1686	[6.53]	14.68	2111	5.37
Aromadendrane-4,10-diol	13.95	1712	0.20	16.59	2307	0.12
2-Methoxyfuranodiene	14.03	1718	3.79	15.29	2173	3.93
2-Acetoxyfuranodiene?	15.90	1885	0.68	18.17	2481	0.57
Myrrhanolide C?	15.98	1892	0.04			
Unknown [m/z 197, 108 (83), 212 (50), 43 (42), 169 (38), 183 (31), 155 (30), 79 (26), 105 (26)]	16.76	1966	0.13	19.83	2676	0.09
Cembrenol	18.37	2125	0.02	19.86	2680	0.01
Serratol	18.57	2146	0.01	19.39	2624	0.13
Total identified		**92.20%**			**93.61%**	
Total reported		**92.32%**			**93.76%**	

*: 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

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