Date : May 26, 2020

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 20E25-PTH03
Customer identification : Myrrh - France - M40109201R
Type : Resin
Source : *Commiphora myrrha*
Customer : Plant Therapy

Analysis

Method: PC-MAT-007 - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID (in French); identifications validated by GC-MS.
Analyst : Sylvain Mercier, M. Sc., Chimiste
Analysis date : May 26, 2020

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Orange liquid
Refractive index: 1.5268 ± 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
Ethanol	tr	Aliphatic alcohol
para-Xylene	tr	Simple phenolic
α-Thujene	tr	Monoterpene
α-Pinene	0.01	Monoterpene
β-Pinene	tr	Monoterpene
Myrcene	tr	Monoterpene
Δ3-Carene	0.01	Monoterpene
α-Terpinene	tr	Monoterpene
para-Cymene	0.01	Monoterpene
Limonene	0.01	Monoterpene
(*E*)-β-Ocimene	0.06	Monoterpene
δ-Elemene isomer	0.03	Sesquiterpene
δ-Elemene	0.73	Sesquiterpene
α-Cubebene	0.05	Sesquiterpene
α-Ylangene	0.02	Sesquiterpene
α-Copaene	0.09	Sesquiterpene
β-Bourbonene	0.26	Sesquiterpene
cis-β-Elemene	0.11	Sesquiterpene
β-Elemene	3.49	Sesquiterpene
β-Caryophyllene	0.20	Sesquiterpene
cis-α-Bergamotene	0.13	Sesquiterpene
β-Copaene	0.12	Sesquiterpene
γ-Elemene	0.75	Sesquiterpene
trans-α-Bergamotene	0.04	Sesquiterpene
Isogermacrene D	0.07	Sesquiterpene
α-Humulene	0.20	Sesquiterpene
4,5-diepi-Aristolochene	0.03	Sesquiterpene
Unknown	0.04	Sesquiterpene
trans-Cadina-1(6),4-diene	0.04	Sesquiterpene
Selina-4,11-diene	0.15	Sesquiterpene
γ-Muurolene	0.08	Sesquiterpene
Germacrene D	0.75	Sesquiterpene
β-Selinene	0.49	Sesquiterpene
δ-Selinene	0.05	Sesquiterpene
Bicyclogermacrene	0.12	Sesquiterpene
α-Selinene	0.39	Sesquiterpene
Curzerene	21.07	Sesquiterpenic ether
Germacrene A	0.17	Sesquiterpene
δ-Amorphene	0.04	Sesquiterpene
ε-Amorphene	0.15	Sesquiterpene
γ-Cadinene	0.31	Sesquiterpene
δ-Cadinene	0.28	Sesquiterpene
Selina-4(15),7(11)-diene	0.12	Sesquiterpene
Unknown	0.08	Sesquiterpene
Selina-3,7(11)-diene	0.17	Sesquiterpene

α-Elemol	0.18	Sesquiterpenic alcohol
Germacrene B	2.15	Sesquiterpene
Furanoeudesma-1,4-diene	0.52	Sesquiterpenic ether
Viridiflorol	0.02	Sesquiterpenic alcohol
β-Elemenone	0.39	Sesquiterpenic ketone
Selin-6-en-4α-ol isomer	0.13	Sesquiterpenic alcohol
γ-Eudesmol	0.27	Sesquiterpenic alcohol
Alismol	0.31	Sesquiterpenic alcohol
Selin-6-en-4α-ol	0.24	Sesquiterpenic alcohol
Furanoeudesma-1,3-diene	28.94	Sesquiterpenic ether
Lindestrene	9.98	Sesquiterpenic ether
τ-Muurolol	0.33	Sesquiterpenic alcohol
τ-Cadinol	0.59	Sesquiterpenic alcohol
α-Muurolol	0.17	Sesquiterpenic alcohol
α-Eudesmol	0.12	Sesquiterpenic alcohol
Furanodiene	0.60	Sesquiterpenic ether
Isofuranogermacrene	0.69	Sesquiterpenic ether
α-Elemyl acetate	1.50	Sesquiterpenic ester
Methoxyfuranodiene analog	3.80	Sesquiterpenic ether
Germacrone	0.67	Sesquiterpenic ketone
Aromadendrane-4,10-diol	0.24	Sesquiterpenic alcohol
2-Methoxyfuranodiene	3.55	Sesquiterpenic ether
2-Acetoxyfuranodiene?	1.45	Sesquiterpenic ester
Myrrhanolide C?	0.15	Sesquiterpenic alcohol
Unknown	0.22	Unknown
Cembrenol	0.04	Diterpenic alcohol
Serratol	0.01	Diterpenic alcohol
Consolidated total	**88.19%**	

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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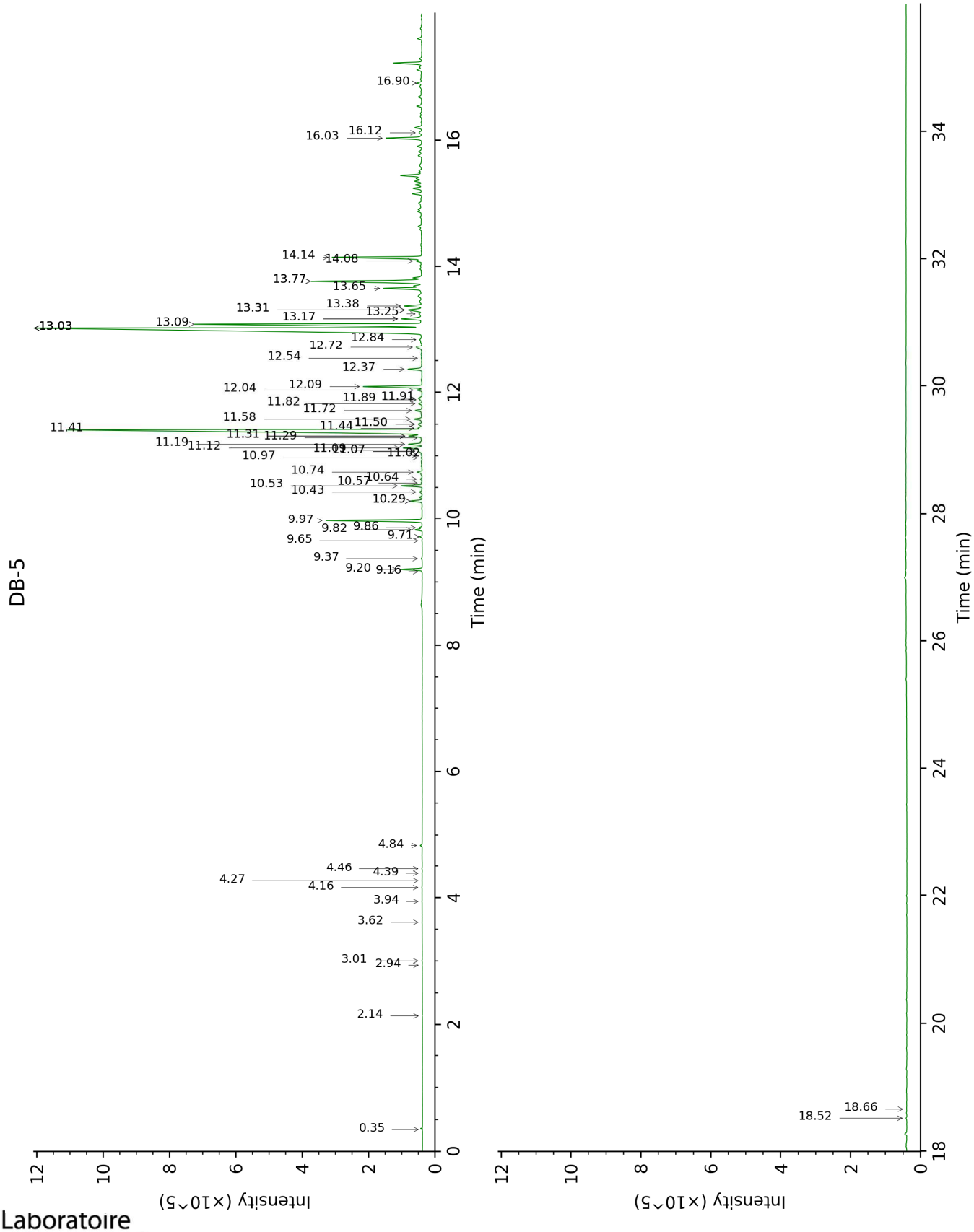
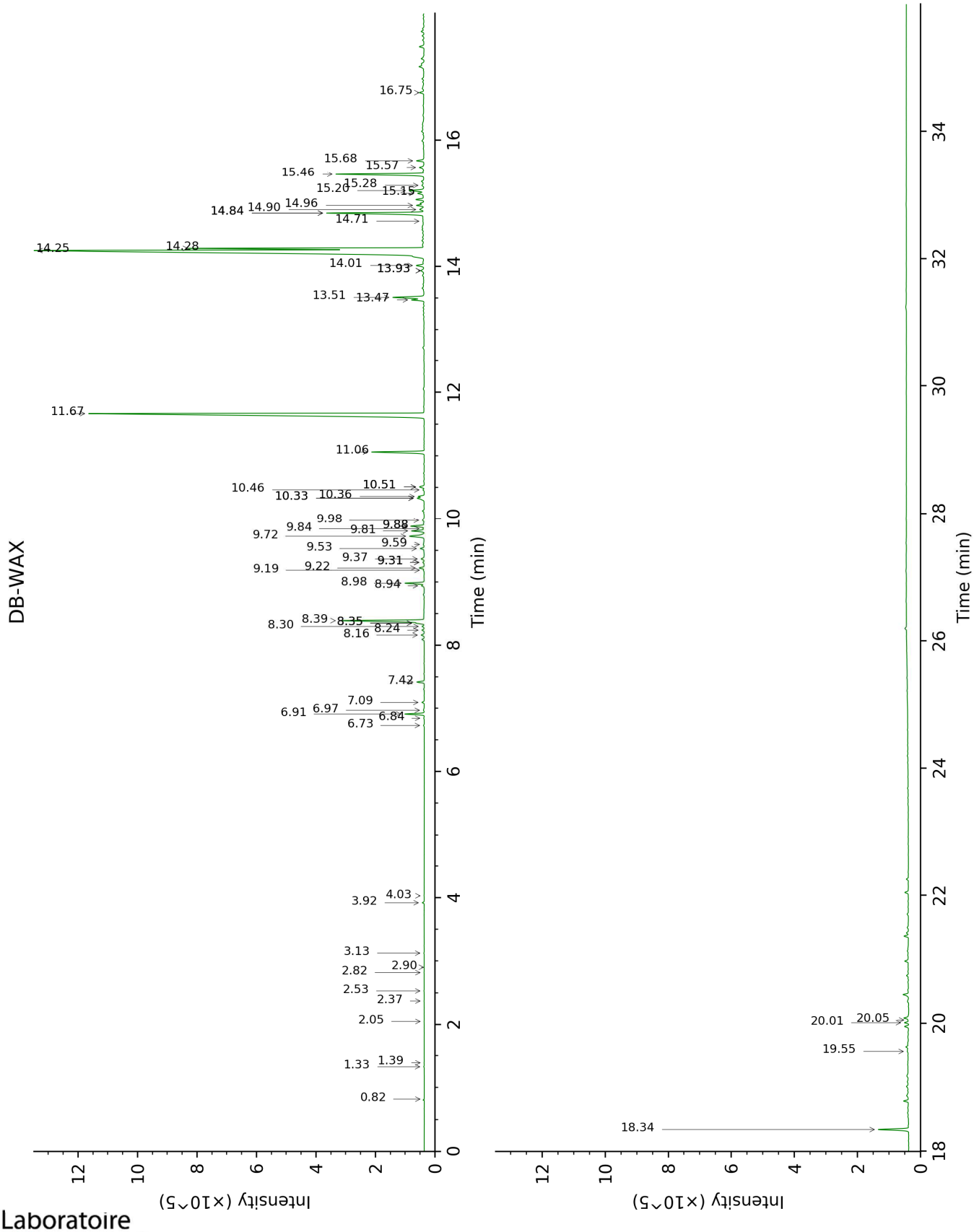

DB-5
16.90
16.03
16.12
14.14
14.08
13.77
13.65
13.31
13.38
13.25
13.09
13.17
13.03
12.84
12.72
12.54
12.37
12.04
12.09
11.89
11.91
11.82
11.72
11.58
11.44
11.50
11.41
11.31
11.29
11.19
11.12
11.07
11.02
10.97
10.74
10.64
10.53
10.57
10.43
10.29
9.97
9.82
9.86
9.71
9.65
9.37
9.20
9.16
4.84
4.46
4.39
4.27
4.16
3.94
3.62
3.01
2.94
2.14
0.35
18.66
18.52
Time (min)
Intensity (×10^5)


DB-WAX
Intensity (×10^5)
Time (min)
16.75
15.68
15.57
15.46
15.20
15.28
15.15
14.84
14.90
14.96
14.71
14.25
14.28
14.01
13.93
13.51
13.47
11.67
11.06
10.46
10.51
10.33
10.36
9.98
9.72
9.84
9.81
9.88
9.53
9.59
9.37
9.31
9.19
9.22
8.98
8.94
8.30
8.39
8.35
8.16
8.24
7.42
7.09
6.91
6.97
6.84
6.73
3.92
4.03
3.13
2.82
2.90
2.53
2.37
2.05
1.33
1.39
0.82
20.01
20.05
19.55
18.34

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Ethanol	0.35	522	tr	0.82	910	tr
para-Xylene	2.14	864	tr	2.37	1099	tr
α-Thujene	2.94	925	tr	1.39	1001	tr
α-Pinene	3.01	930	0.01	1.33	992	0.01
β-Pinene	3.62	970	tr	2.05	1066	tr
Myrcene	3.94	991	tr	2.82	1134	tr
Δ3-Carene	4.16	1006	0.01	2.53	1111	0.01
α-Terpinene	4.27	1013	tr	2.90	1141	tr
para-Cymene	4.39	1020	0.01	4.03	1228	0.01
Limonene	4.46	1024	0.01	3.13	1158	0.01
(*E*)-β-Ocimene	4.84	1048	0.06	3.92	1220	0.06
δ-Elemene isomer	9.16†	1332	0.76	6.84	1429	0.03
δ-Elemene	9.20†	1335	[0.76]	6.91	1434	0.73
α-Cubebene	9.37	1347	0.05	6.73	1420	0.03
α-Ylangene	9.65	1367	0.02	6.97	1438	0.05
α-Copaene	9.72	1371	0.09	7.09	1448	0.09
β-Bourbonene	9.82	1379	0.26	7.42	1472	0.30
cis-β-Elemene	9.86	1381	0.11	8.24	1535	0.08
β-Elemene	9.97	1389	3.49	8.39	1547	3.64
β-Caryophyllene	10.29*	1412	0.47	8.35*	1544	0.24
cis-α-Bergamotene	10.29*	1412	[0.47]	8.16	1529	0.13
β-Copaene	10.43	1423	0.12	8.30	1540	0.07
γ-Elemene	10.53	1430	0.75	8.98	1593	0.76
trans-α-Bergamotene	10.57	1433	0.04	8.35*	1544	[0.24]
Isogermacrene D	10.64	1438	0.07	8.94	1590	0.11
α-Humulene	10.74	1446	0.20	9.22	1612	0.21
4,5-diepi-Aristolochene	10.97	1463	0.03	9.31*	1619	0.06
Unknown [m/z 119, 91 (85), 93 (77), 105 (76), 79 (61), 134 (60), 94 (49), 204 (46)]	11.02	1466	0.04	9.31*	1619	[0.06]
trans-Cadina-1(6),4-diene	11.07*	1470	0.17	9.19	1609	0.04
Selina-4,11-diene	11.07*	1470	[0.17]	9.37	1624	0.15
γ-Muurolene	11.09	1472	0.08	9.53	1637	0.17
Germacrene D	11.12	1474	0.75	9.72	1653	0.84
β-Selinene	11.18	1479	0.49	9.81	1660	0.51
δ-Selinene	11.28	1486	0.05	9.59	1642	0.05
Bicyclogermacrene	11.31*	1488	0.51	9.98	1673	0.12
α-Selinene	11.31*	1488	[0.51]	9.88*	1666	0.57
Curzerene	11.41	1496	21.07	11.67	1817	21.66
Germacrene A	11.44	1498	0.17	10.33*	1702	0.41
δ-Amorphene	11.50*	1502	0.20	9.84	1662	0.04
ε-Amorphene	11.50*	1502	[0.20]	9.88*	1666	[0.57]
γ-Cadinene	11.58	1509	0.31	10.33*	1702	[0.41]
δ-Cadinene	11.72	1519	0.28	10.36	1705	0.24
Selina-4(15),7(11)-	11.82	1528	0.12	10.51*	1718	0.24

diene						
Unknown [m/z 189, 204 (92), 161 (65), 133 (51), 105 (51), 91 (51), 119 (45)]	11.89	1532	0.08	10.46	1714	0.05
Selina-3,7(11)-diene	11.91	1534	0.17	10.51*	1718	[0.24]
α-Elemol	12.04	1544	0.18	13.93*	2024	0.21
Germacrene B	12.09	1549	2.15	11.06	1764	2.22
Furanoeudesma-1,4-diene	12.37	1570	0.52	13.47	1980	0.52
Viridiflorol	12.54	1584	0.02	13.93*	2024	[0.21]
β-Elemenone	12.72	1598	0.39	14.01	2032	0.40
Selin-6-en-4α-ol isomer	12.84	1608	0.13	14.71	2099	0.08
γ-Eudesmol	13.03*	1623	29.76	14.90	2117	0.27
Alismol	13.03*	1623	[29.76]	15.68	2195	0.31
Selin-6-en-4α-ol	13.03*	1623	[29.76]	15.57	2185	0.24
Furanoeudesma-1,3-diene	13.03*	1623	[29.76]	14.25†	2054	41.45
Lindestrene	13.09	1628	9.98	14.28†	2058	[41.45]
τ-Muurolol	13.17*	1635	0.91	14.96	2124	0.33
τ-Cadinol	13.17*	1635	[0.91]	14.84*	2112	4.38
α-Muurolol	13.25	1642	0.17	15.15	2143	0.35
α-Eudesmol	13.31*	1647	0.72	15.28	2156	0.12
Furanodiene	13.31*	1647	[0.72]			
Isofuranogermacrene	13.38	1652	0.69			
α-Elemyl acetate	13.65	1675	1.50	13.51	1984	1.44
Methoxyfuranodiene analog	13.76*	1684	5.14	14.84*	2112	[4.38]
Germacrone	13.76*	1684	[5.14]	15.20	2147	0.67
Aromadendrane-4,10-diol	14.08	1711	0.24	16.75	2307	0.21
2-Methoxyfuranodiene	14.14	1716	3.55	15.46	2173	3.68
2-Acetoxyfuranodiene?	16.03	1884	1.45	18.34	2482	1.23
Myrrhanolide C?	16.12	1892	0.15			
Unknown [m/z 197, 108 (83), 212 (50), 43 (42), 169 (38), 183 (31), 155 (30), 79 (26), 105 (26)]	16.90	1966	0.22	20.01	2677	0.17
Cembrenol	18.52	2126	0.04	20.05	2682	0.02
Serratol	18.66	2141	0.01	19.55	2622	0.04
Total identified		**88.63%**			**89.85%**	
Total reported		**88.96%**			**90.07%**	

*: 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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