CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 23I21-PTH04
Customer Identification : Myrrh - Somaliland (Somalia) - M40114R
Type : Essential Oil
Source : *Commiphora myrrha*
Customer : Plant Therapy

Checked an approved by:

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

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ISO 17025:2017 CERTIFIED METHOD
MÉTHODE CERTIFIÉE

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GAS CHROMATOGRAPHIC ANALYSIS

Method : PC-MAT-014 - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID
✳ISO
Results : See analysis summary (next page)
Analyst : Sylvain Mercier, M. Sc., Chimiste 2014-005
Date : 2023-09-25

PHYSICOCHEMICAL DATA

Refractive index : 1.5245 ± 0.0003 (20 ℃)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2023-09-22

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	0.02	Simple phenolic
α-Pinene	0.01	Monoterpene
Camphene	0.02	Monoterpene
β-Pinene	tr	Monoterpene
Sabinene	tr	Monoterpene
Myrcene	0.02	Monoterpene
para-Cymene	0.01	Monoterpene
Limonene	0.02	Monoterpene
Dimethylbenzofuran isomer I	0.01	Furan
Unknown	0.01	Unknown
3,5-Dimethoxytoluene	0.01	Simple phenolic
Bornyl acetate	0.04	Monoterpenic ester
δ-Elemene isomer	0.04	Sesquiterpene
δ-Elemene	1.28	Sesquiterpene
α-Cubebene	0.03	Sesquiterpene
α-Ylangene	0.02	Sesquiterpene
α-Copaene	0.09	Sesquiterpene
β-Bourbonene	0.49	Sesquiterpene
cis-β-Elemene	0.24	Sesquiterpene
1,5-diepi-β-Bourbonene	0.05	Sesquiterpene
β-Cubebene	0.03	Sesquiterpene
Cyperene	0.04	Sesquiterpene
β-Elemene	8.20	Sesquiterpene
cis-α-Bergamotene	0.02	Sesquiterpene
β-Ylangene	0.17	Sesquiterpene
β-Caryophyllene	0.42	Sesquiterpene
β-Copaene	0.16	Sesquiterpene
γ-Elemene	0.98	Sesquiterpene
trans-α-Bergamotene	0.01	Sesquiterpene
6,9-Guaiadiene	0.02	Sesquiterpene
Isogermacrene D	0.09	Sesquiterpene
Guaia-1(5),6-diene	0.01	Sesquiterpene
Unknown	0.02	Sesquiterpene
α-Humulene	0.25	Sesquiterpene
all*o*-Aromadendrene	0.01	Sesquiterpene
Unknown	0.04	Sesquiterpene
4,5-diepi-Aristolochene	0.05	Sesquiterpene
trans-Cadina-1(6),4-diene	0.03	Sesquiterpene
Unknown	0.10	Sesquiterpene
Selina-4,11-diene	0.22	Sesquiterpene

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Compound	Value	Class
γ-Muurolene	0.09	Sesquiterpene
Germacrene D	1.85	Sesquiterpene
β-Selinene	0.74	Sesquiterpene
Unknown	0.10	Sesquiterpene
δ-Selinene	0.08	Sesquiterpene
Bicyclogermacrene	0.06	Sesquiterpene
α-Selinene	0.72	Sesquiterpene
Curzerene	24.93	Sesquiterpenic ether
ε-Amorphene	0.09	Sesquiterpene
δ-Amorphene	0.88	Sesquiterpene
δ-Guaiene	0.19	Sesquiterpene
(Z)-γ-Bisabolene	0.03	Sesquiterpene
γ-Cadinene	1.08	Sesquiterpene
7-epi-α-Selinene	0.05	Sesquiterpene
δ-Cadinene	0.23	Sesquiterpene
trans-Calamenene	0.01	Sesquiterpene
Selina-4(15),7(11)-diene	0.11	Sesquiterpene
Selina-4,7(11)-diene?	0.07	Sesquiterpene
Selina-3,7(11)-diene	0.12	Sesquiterpene
α-Elemol	0.18	Sesquiterpenic alcohol
Germacrene B	5.58	Sesquiterpene
1,5-Epoxysalvial-4(14)-ene	0.07	Sesquiterpenic ether
Furanoeudesma-1,4-diene	0.60	Sesquiterpenic ether
Caryophyllene oxide	0.05	Sesquiterpenic ether
Viridiflorol	0.03	Sesquiterpenic alcohol
Salvial-4(14)-en-1-one	0.02	Aliphatic alcohol
Curzerenone	0.05	Sesquiterpenic ketone
β-Elemenone	0.13	Sesquiterpenic ketone
Unknown	0.11	Oxygenated sesquiterpene
Selin-6-en-4α-ol isomer	0.04	Sesquiterpenic alcohol
Selin-6-en-4α-ol	0.07	Sesquiterpenic alcohol
Furanoeudesma-1,3-diene	22.08	Sesquiterpenic ether
γ-Eudesmol	0.35	Sesquiterpenic alcohol
Alismol	0.01	Sesquiterpenic alcohol
Lindestrene	7.57	Sesquiterpenic ether
τ-Cadinol	0.23	Sesquiterpenic alcohol
β-Eudesmol	0.15	Sesquiterpenic alcohol
Furanodiene	0.49	Sesquiterpenic ether
Atractylone?	0.63	Sesquiterpenic ether
α-Elemyl acetate	0.72	Sesquiterpenic ester
Juniper camphor	0.01	Sesquiterpenic alcohol
Unknown	9.81	Oxygenated sesquiterpene
Germacrone	0.41	Sesquiterpenic ketone
Aromadendrane-4,10-diol	0.12	Sesquiterpenic alcohol
2-Methoxyfuranodiene	1.35	Sesquiterpenic ether

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Unknown	0.04	Unknown
Unknown	0.01	Sesquiterpenic ester
Unknown	0.05	Sesquiterpenic ester
Isofuranodienone	0.08	Sesquiterpenic ketone
Unknown	0.36	Oxygenated sesquiterpene
2-Acetoxyfuranodiene?	0.14	Sesquiterpenic ester
Myrrhanolide C?	0.12	Sesquiterpenic alcohol
Unknown	0.24	Unknown
Cembrenol	0.02	Diterpenic alcohol
Consolidated total	**96.63**	

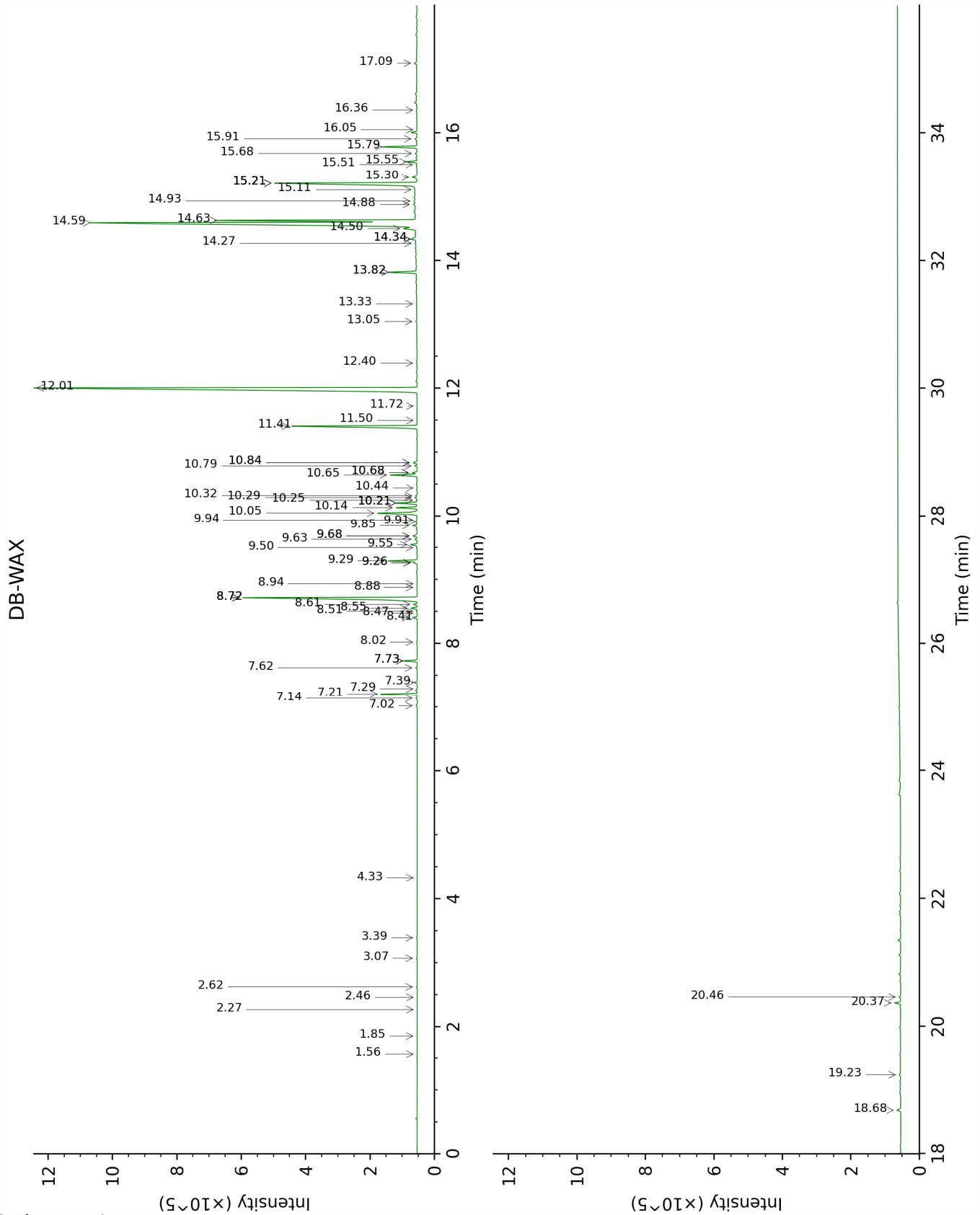tr: The compound has been detected below 0.005% of the total signal

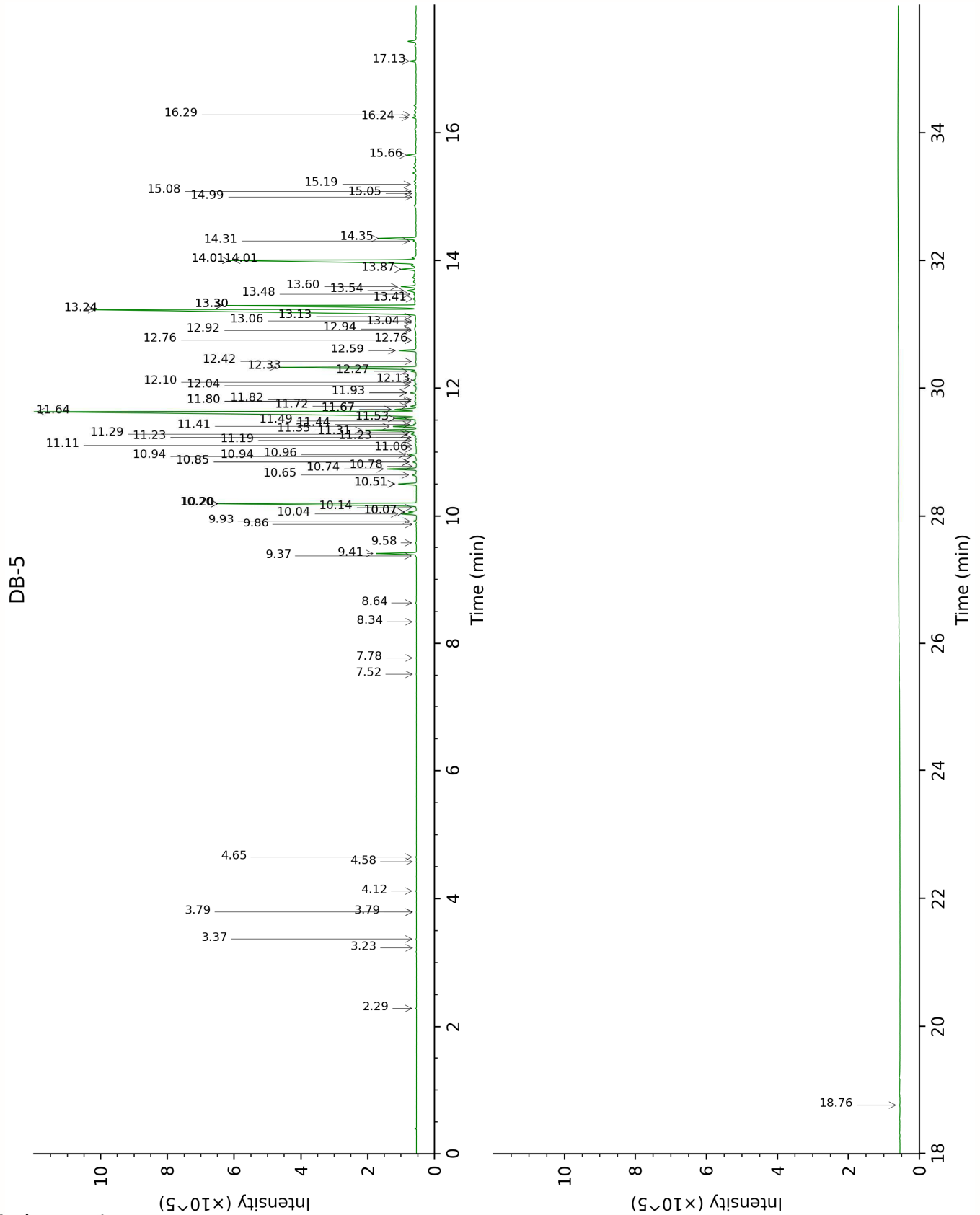Note: no correction factor was applied

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.

Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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DB-WAX

Time (min)

Intensity (×10^5)

Time (min)

Intensity (×10^5)

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DB-5

17.13

16.29 —— 16.24 →

15.66

15.08 ——— 15.19 ——— 15.05 →
14.99 ——— 15.05 →

14.31 ——— 14.35 →
14.01 14.01 —— 13.87 →

13.48 —— 13.60 — 13.54 — 13.41 →
13.24 —— 13.30 —— 13.41 →
13.06 — 13.13 — 13.04 →
12.76 — 12.92 —— 12.94 — 13.04 →
12.76 —— 12.76 →
12.42 — 12.33 —— 12.59 →
12.10 — 12.04 —— 12.27 →
11.80 — 11.82 —— 12.13 →
11.64 —— 11.72 — 11.93 →
11.41 —— 11.67 →
11.29 — 11.23 — 11.49 11.44 — 11.53 →
11.11 —— 11.35 11.31 →
11.19 — 11.23 →
10.94 — 10.85 — 10.94 — 10.96 — 11.06 →
10.65 — 10.74 — 10.78 →
10.51 →
10.20 → 10.14 — 10.07 →
9.93 — 9.86 — 10.04 — 10.14 →
9.37 — 9.41 → 9.58 →

8.64 →
8.34 →

7.78 →
7.52 →

4.65 ————— 4.58 ⇒

4.12 →
3.79 ————— 3.79 →

3.37 ————— 3.23 →

2.29 →

18.76 →

Intensity (×10^5)
Time (min)

Intensity (×10^5)
Time (min)

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FULL ANALYSIS DATA

	Column DB-WAX			Column DB-5		
para-Xylene	2.62	1096.6	0.03	2.29	864.9	0.02
α-Pinene	1.56	997.0	tr	3.23	935.0	0.01
Camphene	1.85	1024.5	0.01	3.37	944.0	0.02
β-Pinene	2.27	1063.8	tr	3.79*	971.7	[0.01]
Sabinene	2.46	1081.8	tr	3.79*	971.7	[0.01]
Myrcene	3.07	1130.9	0.02	4.12	993.2	0.02
para-Cymene	4.33	1226.0	tr	4.58	1022.4	0.01
Limonene	3.39	1155.5	0.02	4.65	1027.0	0.02
Dimethylbenzofuran isomer I				7.52	1207.9	0.01
Unknown COMY III [m/z 148, 105 (70), 133 (36), 119 (35), 91 (22), 77 (16)]				7.78	1224.9	0.01
3,5-Dimethoxytoluene	11.72	1788.5	0.01	8.34	1262.6	0.01
Bornyl acetate	8.51	1528.8	0.03	8.64	1282.3	0.04
δ-Elemene isomer	7.14	1426.5	0.05	9.37	1332.8	0.04
δ-Elemene	7.21	1431.5	1.30	9.41	1335.5	1.28
α-Cubebene	7.02	1417.7	0.04	9.58	1347.2	0.03
α-Ylangene	7.29	1437.5	0.02	9.86	1367.5	0.02
α-Copaene	7.39	1445.1	0.10	9.93	1371.9	0.09
β-Bourbonene	7.73*	1470.1	[0.53]	10.04	1379.8	0.49
cis-β-Elemene	8.55	1532.3	0.24	10.07*	1381.9	[0.27]
1,5-diepi-β-Bourbonene	7.62	1462.0	0.05	10.07*	1381.9	[0.27]
β-Cubebene	8.02	1491.7	0.03	10.14	1386.7	0.03
Cyperene	7.73*	1470.1	[0.53]	10.20*	1391.1	[8.24]
β-Elemene	8.72*	1545.0	[9.11]	10.20*	1391.1	[8.24]
cis-α-Bergamotene	8.48	1526.3	0.02	10.51*	1413.1	[0.61]
β-Ylangene	8.41	1521.1	0.17	10.51*	1413.1	[0.61]
β-Caryophyllene	8.72*	1545.0	[9.11]	10.51*	1413.1	[0.61]
β-Copaene	8.61	1537.0	0.14	10.65	1423.6	0.16
γ-Elemene	9.29	1589.3	1.06	10.74	1430.6	0.98
trans-α-Bergamotene	8.72*	1545.0	[9.11]	10.78	1433.6	0.01
6,9-Guaiadiene	8.88	1557.3	0.02	10.85*	1438.6	[0.11]
Isogermacrene D	9.26*	1586.8	[0.10]	10.85*	1438.6	[0.11]
Guaia-1(5),6-diene	8.94	1561.7	0.01	10.94*	1445.1	[0.05]
Unknown EUMA XII [m/z 93, 107 (85), 105 (82), 189 (79), 91 (69), 81 (68), 79 (60), 161	10.44	1681.5	0.02	10.94*	1445.1	[0.05]

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(55)... 204 (31)]						
α-Humulene	9.55	1609.5	0.27	10.96	1447.1	0.25
allo-Aromadendrene	9.26*	1586.8	[0.10]	11.06	1454.0	0.01
Unknown AMBA XXIX [m/z 161, 105 (68), 119 (54), 91 (52), 93 (41), 79 (39)... 204 (6)]				11.11	1457.9	0.04
4,5-diepi-Aristolochene	9.68*	1620.5	[0.21]	11.19	1463.7	0.05
trans-Cadina-1(6),4-diene	9.50	1605.7	0.03	11.23*	1467.1	[0.06]
Unknown SWGL II [m/z 121, 93 (86), 161 (61), 105 (46), 91 (43), 119 (310, 136 (27)... 204 (19)]	9.63	1616.3	0.10	11.23*	1467.1	[0.06]
Selina-4,11-diene	9.68*	1620.5	[0.21]	11.28	1471.0	0.22
γ-Muurolene	9.85	1633.7	0.18	11.31	1472.7	0.09
Germacrene D	10.05	1649.9	2.00	11.35	1475.6	1.85
β-Selinene	10.14	1656.8	0.79	11.41	1480.0	0.74
Unknown POCA VI [m/z 79, 107 (99), 91 (88), 93 (86), 81 (78), 105 (73), 41 (73)... 204? (12)]	9.94	1641.1	0.04	11.44	1482.1	0.10
δ-Selinene	9.91	1638.9	0.07	11.49	1486.2	0.08
Bicyclogermacrene	10.32	1671.9	0.06	11.53*	1489.3	[0.78]
α-Selinene	10.21*	1662.7	[0.88]	11.53*	1489.3	[0.78]
Curzerene	12.01	1813.3	26.13	11.64	1497.1	24.93
ε-Amorphene	10.29	1669.5	0.09	11.67*	1499.6	[0.97]
δ-Amorphene	10.21*	1662.7	[0.88]	11.67*	1499.6	[0.97]
δ-Guaiene	10.21*	1662.7	[0.88]	11.72	1503.4	0.19
(Z)-γ-Bisabolene	10.25	1666.0	0.03	11.80*	1509.4	[0.06]
γ-Cadinene	10.65	1698.2	1.08	11.80*	1509.4	[0.06]
7-epi-α-Selinene	10.68*	1701.2	[0.18]	11.82	1511.2	0.05
δ-Cadinene	10.68*	1701.2	[0.18]	11.93*	1519.8	[0.24]
trans-Calamenene	11.50	1769.7	0.01	11.93*	1519.8	[0.24]
Selina-4(15),7(11)-diene	10.84*	1714.3	[0.18]	12.04	1528.5	0.11
Selina-4,7(11)-diene?	10.79	1710.1	0.09	12.10	1532.7	0.07
Selina-3,7(11)-diene	10.84*	1714.3	[0.18]	12.13	1535.2	0.12
α-Elemol	14.34*	2024.1	[0.27]	12.27	1546.2	0.18
Germacrene B	11.41	1762.3	5.87	12.33	1551.0	5.58
1,5-Epoxysalvial-	12.40	1847.3	0.04	12.42	1558.3	0.07

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4(14)-ene						
Furanoeudesma-1,4-diene	13.82*	1975.8	[1.11]	12.59*	1571.6	[0.65]
Caryophyllene oxide	13.05	1905.7	0.05	12.59*	1571.6	[0.65]
Viridiflorol	14.27	2018.0	0.03	12.76*	1585.0	[0.05]
Salvial-4(14)-en-1-one	13.33	1930.8	0.02	12.76*	1585.0	[0.05]
Curzerenone	15.51	2137.3	0.03	12.92	1597.0	0.05
β-Elemenone	14.34*	2024.1	[0.27]	12.94	1598.6	0.13
Unknown MIAL II [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)]	14.88	2075.3	0.08	13.04	1606.4	0.11
Selin-6-en-4α-ol isomer	15.11	2097.7	0.03	13.06	1608.8	0.04
Selin-6-en-4α-ol	15.91	2177.1	0.09	13.13	1614.4	0.07
Furanoeudesma-1,3-diene	14.59	2048.4	23.62	13.24	1623.2	22.08
γ-Eudesmol	15.21*	2107.7	[7.75]	13.30*	1628.5	[7.94]
Alismol	16.06	2191.7	0.01	13.30*	1628.5	[7.94]
Lindestrene	14.63	2052.0	7.57	13.30*	1628.5	[7.94]
τ-Cadinol	15.21*	2107.7	[7.75]	13.41	1637.2	0.23
β-Eudesmol	15.68	2154.5	0.09	13.48	1643.0	0.15
Furanodiene	14.50	2039.8	0.62	13.54	1647.7	0.49
Atractylone?				13.60	1652.9	0.63
α-Elemyl acetate	13.82*	1975.8	[1.11]	13.87	1675.2	0.72
Juniper camphor	16.36	2222.9	0.01	14.01*	1686.6	[10.23]
Unknown COMY IV [m/z 108, 216 (29), 93 (26), 109 (21), 91 (21)]	15.21*	2107.7	[7.75]	14.01*	1686.6	[10.23]
Germacrone	15.55	2141.7	0.41	14.01*	1686.6	[10.23]
Aromadendrane-4,10-diol	17.09	2298.6	0.12	14.31	1711.7	0.12
2-Methoxyfuranodiene	15.79	2164.8	1.38	14.35	1715.4	1.35
Unknown COPE IV [m/z 161, 189 (92), 204 (80), 43 (35), 133 (31), 105 (29)...]	14.93	2080.4	0.05	14.99	1771.0	0.04
Unknown FEGA VI [m/z 161, 189 (59), 204 (54), 43 (50), 107 (28), 149 (24), 122 (24)...]	15.30	2117.1	0.25	15.05	1775.9	0.01

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Compound	R.T.	R.I.	%	R.T.	R.I.	%
Unknown ALAL I [m/z 161, 43 (96), 204 (71), 189 (53), 105 (34), 133 (32), 91 (29)...]	15.21*	2107.7	[7.75]	15.08	1778.8	0.05
Isofuranodienone				15.19	1788.1	0.08
Unknown COMY II [m/z 108, 109 (74), 106 (58), 148 (48), 43 (42), 91 (40), 105 (29), 230 (26)... 274 (13)]				15.66	1829.8	0.36
2-Acetoxyfuranodiene?	18.68	2470.2	0.19	16.24	1883.2	0.14
Myrrhanolide C?	19.24	2533.1	0.08	16.29	1887.0	0.12
Unknown COMY I [m/z 197, 108 (83), 212 (50), 43 (42), 169 (38), 183 (31), 155 (30), 79 (26), 105 (26)]	20.37	2664.9	0.25	17.13	1966.2	0.24
Cembrenol	20.46	2675.9	0.07	18.76	2127.6	0.02
Total reported		95.68%			95.51%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, only the first one is 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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