CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 23J27-PTH02
Customer Identification : Cananga - Indoenisia - CR3102R
Type : Essential Oil
Source : *Cananga odorata var. macrophylla (Cananga)*
Customer : Plant Therapy

Checked an approved by:

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

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MÉTHODE CERTIFIÉE
ISO 17025:2017
CERTIFIED METHOD

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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 : 2023-10-31

PHYSICOCHEMICAL DATA

Refractive index : 1.5023 ± 0.0003 (20 ℃)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2023-10-27

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
Toluene	tr	Simple phenolic
α-Thujene	0.04	Monoterpene
α-Pinene	0.12	Monoterpene
Camphene	tr	Monoterpene
Sabinene	0.12	Monoterpene
β-Pinene	0.01	Monoterpene
Myrcene	0.33	Monoterpene
α-Phellandrene	0.02	Monoterpene
(3*Z*)-Hexenyl acetate	0.01	Aliphatic ester
α-Terpinene	0.13	Monoterpene
para-Methylanisole	1.35	Simple phenolic
para-Cymene	0.06	Monoterpene
β-Phellandrene	0.03	Monoterpene
Limonene	0.05	Monoterpene
(*Z*)-β-Ocimene	0.13	Monoterpene
(*E*)-β-Ocimene	0.15	Monoterpene
γ-Terpinene	0.19	Monoterpene
Terpinolene	0.07	Monoterpene
Methyl benzoate	0.07	Phenolic ester
Linalool	1.81	Monoterpenic alcohol
Benzyl acetate	0.05	Phenolic ester
para-Cresyl acetate	0.01	Phenolic ester
Terpinen-4-ol	0.34	Monoterpenic alcohol
α-Terpineol	0.06	Monoterpenic alcohol
Methylchavicol	0.07	Phenylpropanoid
Nerol	0.04	Monoterpenic alcohol
Neral	0.05	Monoterpenic aldehyde
3,4-Dimethoxytoluene	0.06	Phenolic ester
Geraniol	0.77	Monoterpenic alcohol
Geranial	0.06	Monoterpenic aldehyde
(*E*)-Anethole	0.01	Phenylpropanoid
Unknown	0.05	Sesquiterpene
δ-Elemene	0.06	Sesquiterpene
Benzyl butyrate	0.02	Phenolic ester
α-Cubebene	0.22	Sesquiterpene
Eugenol	0.27	Phenylpropanoid
Neryl acetate	0.02	Monoterpenic ester
α-Ylangene	0.19	Sesquiterpene
α-Copaene	1.33	Sesquiterpene
β-Bourbonene	0.01	Sesquiterpene

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β-Cubebene	0.13	Sesquiterpene
Geranyl acetate	1.60	Monoterpenic ester
β-Elemene	0.50	Sesquiterpene
Vanillin	0.01	Simple phenolic
Cyperene	0.02	Sesquiterpene
Isocaryophyllene	0.03	Sesquiterpene
Methyleugenol	0.13	Phenylpropanoid
α-Gurjunene	0.03	Sesquiterpene
β-Caryophyllene	30.94	Sesquiterpene
Caryophylla-4(12),8(13)-diene	0.07	Sesquiterpene
β-Copaene	0.52	Sesquiterpene
Aromadendrene	0.12	Sesquiterpene
α-Guaiene	0.04	Sesquiterpene
Isogermacrene D	0.01	Sesquiterpene
trans-Muurola-3,5-diene	0.11	Sesquiterpene
α-Humulene	7.16	Sesquiterpene
(*E*)-Isoeugenol	0.05	Phenylpropanoid
α-Patchoulene	0.01	Sesquiterpene
cis-Cadina-1(6),4-diene	0.06	Sesquiterpene
cis-Muurola-4(15),5-diene	0.45	Sesquiterpene
trans-Cadina-1(6),4-diene	0.45	Sesquiterpene
γ-Muurolene	2.32	Sesquiterpene
α-Amorphene	0.11	Sesquiterpene
Germacrene D	8.84	Sesquiterpene
trans-Muurola-4(15),5-diene	0.15	Sesquiterpene
Prenyl benzoate	0.32	Phenolic ester
epi-Cubebol	0.03	Sesquiterpenic alcohol
Bicyclogermacrene	1.29	Sesquiterpene
Unknown	0.95	Sesquiterpene
(3*Z*,6*E*)-α-Farnesene	0.10	Sesquiterpene
α-Muurolene	0.25	Sesquiterpene
δ-Guaiene	0.63	Sesquiterpene
δ-Amorphene	0.54	Sesquiterpene
Unknown	4.65	Sesquiterpene
(3*E*,6*E*)-α-Farnesene	5.97	Sesquiterpene
γ-Cadinene	1.36	Sesquiterpene
Cubebol	0.02	Sesquiterpenic alcohol
trans-Calamenene	0.15	Sesquiterpene
Zonarene	0.02	Sesquiterpene
δ-Cadinene	4.13	Sesquiterpene
trans-Cadina-1,4-diene	0.35	Sesquiterpene
α-Cadinene	0.31	Sesquiterpene
α-Calacorene	0.05	Sesquiterpene
cis-Dracunculifoliol	0.02	Sesquiterpenic alcohol
α-Elemol	0.33	Sesquiterpenic alcohol

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Germacrene B	0.04	Sesquiterpene
Sesquirosefuran?	0.02	Sesquiterpenic ether
(*E*)-Nerolidol	0.07	Sesquiterpenic alcohol
β-Calacorene	0.11	Sesquiterpene
(3*Z*)-Hexenyl benzoate	0.05	Phenolic ester
Caryophyllene oxide isomer	0.05	Sesquiterpenic ether
Caryophyllene oxide	0.33	Sesquiterpenic ether
Globulol	0.19	Sesquiterpenic alcohol
Unknown	0.09	Sesquiterpenic alcohol
Viridiflorol	0.05	Sesquiterpenic alcohol
Unknown	0.10	Oxygenated sesquiterpene
Guaiol	0.06	Sesquiterpenic alcohol
Copaborneol	0.13	Sesquiterpenic alcohol
Humulene epoxide II	0.10	Sesquiterpenic ether
Junenol	0.32	Sesquiterpenic alcohol
10-epi-Cubenol	0.11	Sesquiterpenic alcohol
1-epi-Cubenol	0.36	Sesquiterpenic alcohol
γ-Eudesmol	0.27	Sesquiterpenic alcohol
τ-Muurolol	0.85	Sesquiterpenic alcohol
τ-Cadinol	0.28	Sesquiterpenic alcohol
Cubenol	0.23	Sesquiterpenic alcohol
α-Muurolol	0.49	Sesquiterpenic alcohol
Unknown	0.31	Sesquiterpenic alcohol
α-Cadinol	1.58	Sesquiterpenic alcohol
trans-Calamenen-10-ol	0.03	Sesquiterpenic alcohol
Bulnesol	0.06	Sesquiterpenic alcohol
Unknown	0.13	Oxygenated sesquiterpene
(2*E*,6*Z*)-Farnesol	0.02	Sesquiterpenic alcohol
(2*E*,6*E*)-Farnesol	1.48	Sesquiterpenic alcohol
(2*E*,6*E*)-Farnesal	0.05	Sesquiterpenic aldehyde
Benzyl benzoate	4.02	Phenolic ester
(2*E*,6*E*)-Farnesyl acetate	0.49	Sesquiterpenic ester
Benzyl salicylate	0.43	Phenolic ester
Geranyl benzoate	0.21	Phenolic ester
Consolidated total	**96.83**	

tr: The compound has been detected below 0.005% of the total signal
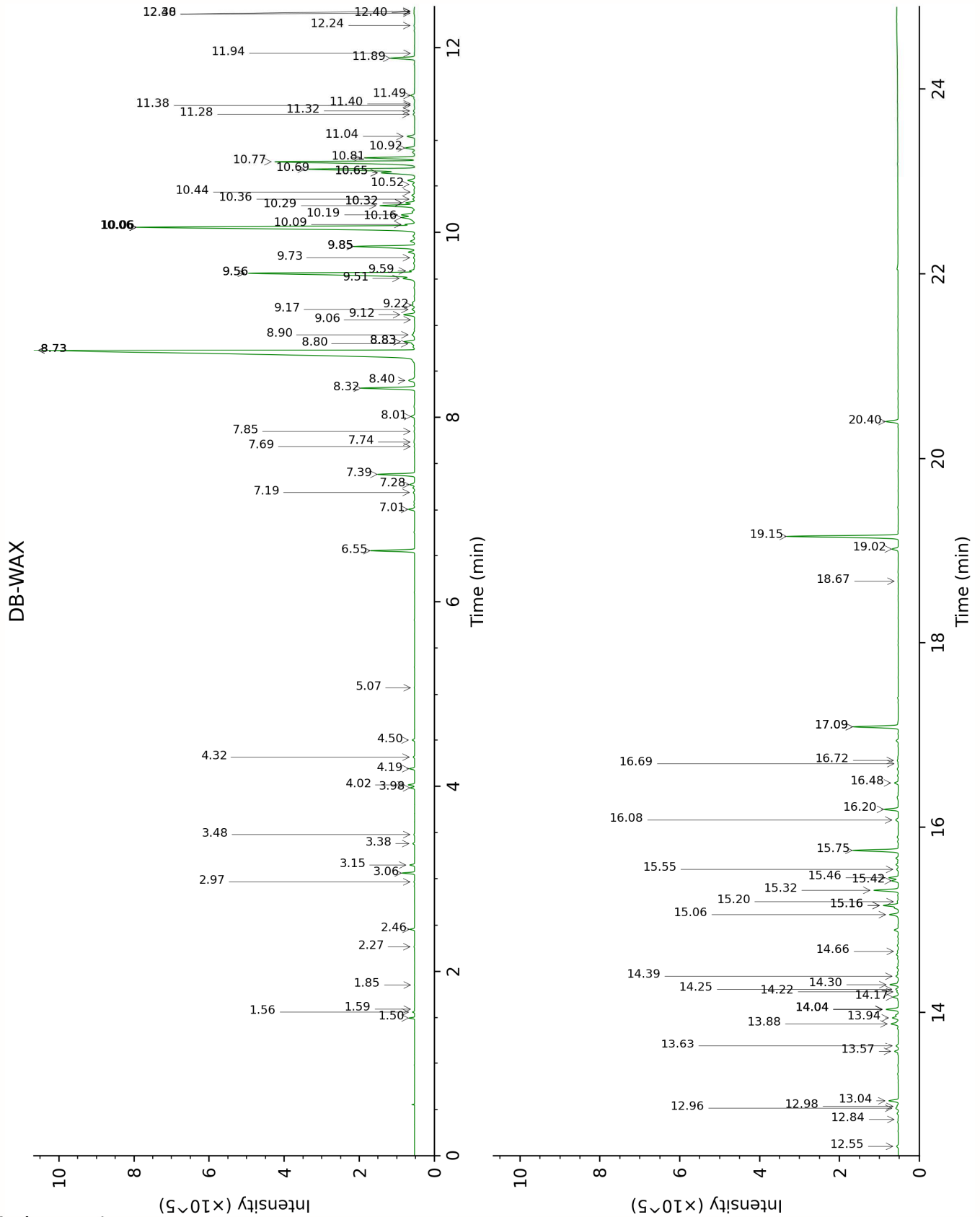
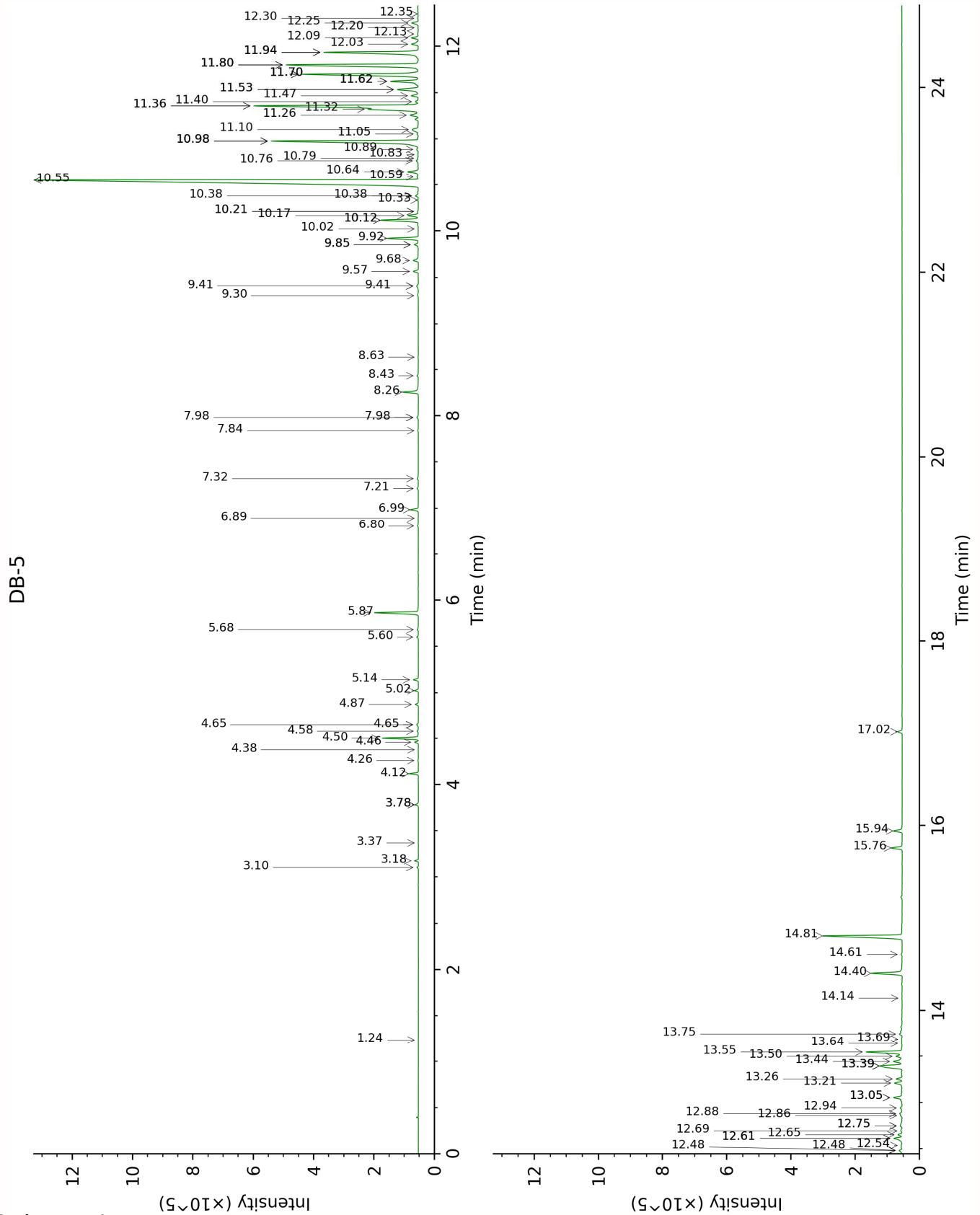Note: no correction factor was applied

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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This page was intentionally left blank. The following pages present the complete data of the analysis.

DB-WAX

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DB-5

Intensity (×10^5)

Time (min)

Intensity (×10^5)

Time (min)

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FULL ANALYSIS DATA

Toluene	Column DB-WAX			Column DB-5		
	1.59	1003.8	tr	1.24	761.6	tr
α-Thujene	1.56	1000.8	0.04	3.10	926.8	0.04
α-Pinene	1.50	992.7	0.12	3.18	931.6	0.12
Camphene	1.86	1028.4	tr	3.37	944.2	tr
Sabinene	2.46	1085.1	0.12	3.78*	971.3	[0.14]
β-Pinene	2.27	1067.3	0.01	3.78*	971.3	[0.14]
Myrcene	3.06	1133.4	0.33	4.12	993.4	0.33
α-Phellandrene	2.97	1126.2	0.02	4.26	1002.7	0.02
(3Z)-Hexenyl acetate	5.07	1279.4	0.01	4.38	1010.1	0.01
α-Terpinene	3.15	1140.0	0.13	4.46	1015.2	0.13
para-Methylanisole	6.55	1387.5	1.37	4.50	1017.9	1.35
para-Cymene	4.32	1226.0	0.05	4.58	1022.6	0.06
β-Phellandrene	3.48	1164.8	0.03	4.65*	1027.0	[0.09]
Limonene	3.38	1157.5	0.05	4.65*	1027.0	[0.09]
(Z)-β-Ocimene	3.98	1202.5	0.12	4.87	1040.6	0.13
(E)-β-Ocimene	4.19	1217.1	0.15	5.02	1050.4	0.15
γ-Terpinene	4.02	1204.8	0.19	5.14	1057.7	0.19
Terpinolene	4.50	1239.0	0.07	5.60	1086.5	0.07
Methyl benzoate	8.90	1561.9	0.13	5.68	1091.5	0.07
Linalool	8.32	1517.3	1.79	5.87	1102.9	1.81
Benzyl acetate	10.32*	1674.3	[0.30]	6.80	1162.7	0.05
para-Cresyl acetate				6.89	1168.3	0.01
Terpinen-4-ol	8.83*	1556.3	[0.37]	6.99	1174.2	0.34
α-Terpineol	10.06*	1653.2	[14.05]	7.22	1188.8	0.06
Methylchavicol	9.59	1615.6	0.18	7.32	1195.6	0.07
Nerol	11.32	1757.3	0.05	7.84	1229.7	0.04
Neral	9.73	1626.9	0.05	7.98*	1239.2	[0.08]
3,4-Dimethoxytoluene	11.28	1754.2	0.06	7.98*	1239.2	[0.08]
Geraniol	11.89	1805.7	0.82	8.26	1257.5	0.77
Geranial	10.36	1677.5	0.06	8.43	1269.3	0.06
(E)-Anethole	11.40	1763.7	0.01	8.64	1282.7	0.01
Unknown CULA I [m/z 81, 79 (45), 91 (40), 67 (40), 69 939), 93 (39)... 204? (6)]				9.30	1328.7	0.05
δ-Elemene	7.19	1433.8	0.06	9.41*	1336.0	[0.11]
Benzyl butyrate	11.94	1810.3	0.02	9.41*	1336.0	[0.11]
α-Cubebene	7.01	1420.4	0.21	9.57	1347.0	0.22

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Compound						
Eugenol	15.06	2097.4	0.33	9.68	1355.3	0.27
Neryl acetate	10.44	1683.6	0.02	9.85*	1367.3	[0.20]
α-Ylangene	7.28	1440.0	0.19	9.85*	1367.3	[0.20]
α-Copaene	7.39	1448.1	1.32	9.92	1372.1	1.33
β-Bourbonene	7.74	1473.7	0.05	10.02	1379.2	0.01
β-Cubebene	8.01	1493.9	0.13	10.12*	1385.8	[1.70]
Geranyl acetate	10.81	1714.7	1.60	10.12*	1385.8	[1.70]
β-Elemene	8.73*	1548.9	[31.33]	10.17	1389.3	0.50
Vanillin	18.67	2478.5	0.01	10.21*	1392.4	[0.05]
Cyperene	7.69	1470.1	0.02	10.21*	1392.4	[0.05]
Isocaryophyllene	8.40	1523.7	0.30	10.33	1401.0	0.03
Methyleugenol	13.57	1956.5	0.13	10.38*	1404.3	[0.13]
α-Gurjunene	7.85	1482.1	0.03	10.38*	1404.3	[0.13]
β-Caryophyllene	8.73*	1548.9	[31.33]	10.55	1417.0	30.94
Caryophylla-4(12),8(13)-diene	8.80	1554.6	0.08	10.58	1419.6	0.07
β-Copaene	8.73*	1548.9	[31.33]	10.64	1424.0	0.52
Aromadendrene	8.83*	1556.3	[0.37]	10.76	1432.9	0.12
α-Guaiene	8.73*	1548.9	[31.33]	10.79	1434.8	0.04
Isogermacrene D	9.17	1582.8	0.11	10.83	1437.8	0.01
trans-Muurola-3,5-diene	9.12	1578.5	0.41	10.89	1442.0	0.11
α-Humulene	9.56*	1613.5	[7.61]	10.98*	1448.7	[8.04]
(E)-Isoeugenol	16.72	2266.5	0.05	10.98*	1448.7	[8.04]
α-Patchoulene	9.06	1574.3	0.01	10.98*	1448.7	[8.04]
cis-Cadina-1(6),4-diene	9.22	1586.4	0.11	11.05	1454.4	0.06
cis-Muurola-4(15),5-diene	9.56*	1613.5	[7.61]	11.10	1457.9	0.45
trans-Cadina-1(6),4-diene	9.51	1609.1	0.46	11.26	1469.5	0.45
γ-Muurolene	9.85*	1636.6	[2.43]	11.32	1474.3	2.32
α-Amorphene	9.85*	1636.6	[2.43]	11.36*	1477.0	[8.95]
Germacrene D	10.06*	1653.2	[14.05]	11.36*	1477.0	[8.95]
trans-Muurola-4(15),5-diene	10.09	1655.6	0.23	11.40	1480.3	0.15
Prenyl benzoate	14.04*	1999.2	[0.43]	11.47	1485.1	0.32
epi-Cubebol	12.24	1836.7	0.03	11.53*	1490.0	[1.20]
Bicyclogermacrene	10.29	1671.9	1.29	11.53*	1490.0	[1.20]
Unknown CAOD II [m/z 119, 41 (95), 123 (53), 80 (49), 161 (44), 105 (42)... 204 (2)]				11.62*	1496.7	[1.30]
(3Z,6E)-α-	10.52	1690.2	0.10	11.62*	1496.7	[1.30]

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Farnesene						
α-Muurolene	10.32*	1674.3	[0.30]	11.62*	1496.7	[1.30]
δ-Guaiene	10.16	1661.6	0.63	11.70*	1502.4	[5.82]
δ-Amorphene	10.19	1663.9	0.54	11.70*	1502.4	[5.82]
Unknown CAOD III, not seen in MS	10.06*	1653.2	[14.05]	11.70*	1502.4	[5.82]
(3*E*,6*E*)-α-Farnesene	10.77	1711.2	5.97	11.80*	1510.2	[7.35]
γ-Cadinene	10.65*	1701.2	[1.38]	11.80*	1510.2	[7.35]
Cubebol	12.84	1889.0	0.02	11.80*	1510.2	[7.35]
trans-Calamenene	11.49	1771.4	0.15	11.94*	1520.8	[4.80]
Zonarene	10.65*	1701.2	[1.38]	11.94*	1520.8	[4.80]
δ-Cadinene	10.69	1704.5	4.13	11.94*	1520.8	[4.80]
trans-Cadina-1,4-diene	10.92	1723.7	0.34	12.02	1527.7	0.35
α-Cadinene	11.04	1734.3	0.28	12.09	1533.0	0.31
α-Calacorene	12.38	1848.5	0.04	12.14	1536.3	0.05
cis-Dracunculifoliol	12.40*	1850.4	[0.04]	12.20	1541.6	0.02
α-Elemol	14.30	2024.7	0.29	12.25	1545.6	0.33
Germacrene B	11.38	1762.3	0.02	12.30	1549.6	0.04
Sesquirosefuran?	12.40*	1850.4	[0.04]	12.35	1553.3	0.02
(*E*)-Nerolidol	14.04*	1999.2	[0.43]	12.48*	1563.3	[0.18]
β-Calacorene	12.96	1900.1	0.11	12.48*	1563.3	[0.18]
(3*Z*)-Hexenyl benzoate	14.66	2059.1	0.04	12.54	1567.7	0.05
Caryophyllene oxide isomer	12.98	1901.9	0.05	12.61*	1573.7	[0.49]
Caryophyllene oxide	13.04	1907.4	0.33	12.61*	1573.7	[0.49]
Globulol	14.17	2011.9	0.19	12.65	1576.7	0.19
Unknown cadinol or muurolol analog [m/z 161, 119 (77), 120 (76), 105 (73), 93 (57)... 204 (36)]	12.55	1863.5	0.07	12.69	1579.9	0.09
Viridiflorol	14.22	2017.4	0.05	12.75*	1584.2	[0.17]
Unknown MECA III [m/z 161, 105 (84), 43 (80), 119 (72), 93 (62), 121 (54)... 204 (38), 222 (2)]	14.25	2020.0	0.10	12.75*	1584.2	[0.17]
Guaiol	14.39	2033.4	0.10	12.86	1593.0	0.06
Copaborneol	15.20	2111.3	0.05	12.88	1594.6	0.13
Humulene	13.63	1962.0	0.08	12.94	1599.4	0.10

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	R.T.	R.I.	%	R.T.	R.I.	%
epoxide II						
Junenol	13.88	1984.4	0.32	13.05*	1608.4	[0.43]
10-epi-Cubenol	14.04*	1999.2	[0.43]	13.05*	1608.4	[0.43]
1-epi-Cubenol	14.04*	1999.2	[0.43]	13.21	1621.3	0.36
γ-Eudesmol	15.16*	2107.3	[0.54]	13.26	1625.1	0.27
τ-Muurolol	15.32	2123.6	0.85	13.40*	1636.6	[1.51]
τ-Cadinol	15.16*	2107.3	[0.54]	13.40*	1636.6	[1.51]
Cubenol	13.94	1990.4	0.23	13.40*	1636.6	[1.51]
α-Muurolol	15.46	2137.1	0.32	13.44	1640.7	0.49
Unknown cadinol analog II [m/z 95, 121 (73), 43 (57), 79 (43), 161 (43), 109 (40)... 204 (35), 222 (2)]	15.42	2133.9	0.23	13.50	1645.3	0.31
α-Cadinol	15.75	2166.6	1.59	13.55	1649.1	1.58
trans-Calamenen-10-ol	17.09*	2304.9	[1.58]	13.64	1657.0	0.03
Bulnesol	15.55	2146.2	0.07	13.69	1661.0	0.06
Unknown CAOD I [m/z 123, 95 (31), 81 (29), 105 (27)... 222 (5)]	16.48	2241.3	0.14	13.75	1665.6	0.13
(2*E*,6*Z*)-Farnesol	16.69	2262.9	0.02	14.14	1697.7	0.02
(2*E*,6*E*)-Farnesol	17.09*	2304.9	[1.58]	14.40	1720.7	1.48
(2*E*,6*E*)-Farnesal	16.08	2199.8	0.11	14.61	1738.3	0.05
Benzyl benzoate	19.15	2534.4	4.05	14.81	1755.6	4.02
(2*E*,6*E*)-Farnesyl acetate	16.20	2211.8	0.48	15.76	1839.7	0.49
Benzyl salicylate	20.40	2682.3	0.45	15.94	1856.3	0.43
Geranyl benzoate	19.02	2518.6	0.24	17.02	1956.1	0.21
Total reported		96.01%			98.30%	

*: 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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