

Date : 2024-08-29

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24H16-PTH03

Customer Identification : Cananga - Indonesia - CR3103R

Type : Essential Oil

Source : *Cananga odorata* var. *macrophylla* (Cananga)

Customer : Plant Therapy

Checked and approved by:

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

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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 : 2024-08-26

PHYSICOCHEMICAL DATA

Refractive index : 1.5023 ± 0.0003 (20 °C)

Method : PC-MAT-016 - Measure of the refractive index of a liquid.

Analyst : Cassandra Baker

Date : 2024-08-19

CONCLUSION

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

ANALYSIS SUMMARY - CONSOLIDATED CONTENTS

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

Identification	%	Class
Prenyl acetate	0.02	Aliphatic ester
α -Thujene	0.05	Monoterpene
α -Pinene	0.18	Monoterpene
Camphene	tr	Monoterpene
Sabinene	0.18	Monoterpene
β -Pinene	0.03	Monoterpene
6-Methyl-5-hepten-2-one	0.02	Aliphatic ketone
Myrcene	0.52	Monoterpene
α -Phellandrene	0.03	Monoterpene
α -Terpinene	0.20	Monoterpene
<i>para</i> -Methylanisole	1.45	Simple phenolic
Hexyl acetate	0.10	Aliphatic ester
<i>para</i> -Cymene	0.05	Monoterpene
1,8-Cineole	[0.05]	Monoterpenic ether
β -Phellandrene	[0.05]	Monoterpene
Limonene	0.06	Monoterpene
(<i>Z</i>)- β -Ocimene	0.07	Monoterpene
(<i>E</i>)- β -Ocimene	0.03	Monoterpene
γ -Terpinene	0.32	Monoterpene
<i>para</i> -Cresol	0.09	Simple phenolic
Methyl benzoate	0.02	Phenolic ester
Linalool	1.50	Monoterpenic alcohol
Nonanal	0.04	Aliphatic aldehyde
<i>cis-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
<i>trans-para</i> -Menth-2-en-1-ol	0.01	Monoterpenic alcohol
Benzyl acetate	tr	Phenolic ester
Terpinen-4-ol	0.59	Monoterpenic alcohol
α -Terpineol	0.06	Monoterpenic alcohol
Methylchavicol	0.07	Phenylpropanoid
Nerol	0.05	Monoterpenic alcohol
Neral	0.06	Monoterpenic aldehyde
Geraniol	0.90	Monoterpenic alcohol
Geranial	0.09	Monoterpenic aldehyde
(<i>E</i>)-Anethole	0.02	Phenylpropanoid
1-Nitro-2-phenylethane	0.02	Simple phenolic
Unknown	0.05	Sesquiterpene
Benzyl butyrate	0.01	Phenolic ester
δ -Elemene	0.04	Sesquiterpene
α -Cubebene	0.22	Sesquiterpene
Eugenol	0.30	Phenylpropanoid

α -Ylangene	0.20	Sesquiterpene
Neryl acetate	0.10	Monoterpenic ester
α -Copaene	1.36	Sesquiterpene
β -Bourbonene	0.01	Sesquiterpene
β -Cubebene	0.13	Sesquiterpene
Geranyl acetate	1.54	Monoterpenic ester
β -Elemene	0.47	Sesquiterpene
Cyperene	0.04	Sesquiterpene
Vanillin	0.01	Simple phenolic
Isocaryophyllene	0.03	Sesquiterpene
Methyleugenol	0.10	Phenylpropanoid
α -Gurjunene	0.03	Sesquiterpene
β -Caryophyllene	31.31	Sesquiterpene
Caryophylla-4(12),8(13)-diene	0.07	Sesquiterpene
β -Copaene	0.53	Sesquiterpene
Aromadendrene	0.13	Sesquiterpene
α -Guaiene	0.04	Sesquiterpene
Isogermacrene D	0.03	Sesquiterpene
<i>trans</i> -Muuroala-3,5-diene	0.12	Sesquiterpene
(<i>E</i>)-Isoeugenol	0.02	Phenylpropanoid
α -Patchoulene	0.01	Sesquiterpene
α -Humulene	8.18	Sesquiterpene
<i>cis</i> -Muuroala-4(15),5-diene	0.30	Sesquiterpene
<i>cis</i> -Cadina-1(6),4-diene	0.14	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.50	Sesquiterpene
γ -Muurolene	2.67	Sesquiterpene
Germacrene D	7.83	Sesquiterpene
<i>trans</i> -Muuroala-4(15),5-diene	0.02	Sesquiterpene
Prenyl benzoate	0.34	Phenolic ester
Bicyclogermacrene	1.26	Sesquiterpene
Methyl (<i>E</i>)-isoeugenol	0.14	Phenylpropanoid
α -Muurolene	0.35	Sesquiterpene
(3 <i>Z</i> ,6 <i>E</i>)- α -Farnesene	0.09	Sesquiterpene
Unknown	0.92	Sesquiterpene
Unknown	3.72	Sesquiterpene
δ -Guaiene	0.73	Sesquiterpene
δ -Amorphene	0.61	Sesquiterpene
Cubebol	0.02	Sesquiterpenic alcohol
γ -Cadinene	1.03	Sesquiterpene
(3 <i>E</i> ,6 <i>E</i>)- α -Farnesene	6.44	Sesquiterpene
Zonarene	0.46	Sesquiterpene
<i>trans</i> -Calamenene	0.12	Sesquiterpene
δ -Cadinene	4.47	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.38	Sesquiterpene
α -Cadinene	0.33	Sesquiterpene

α -Calacorene	0.05	Sesquiterpene
<i>cis</i> -Dracunculifoliol	0.01	Sesquiterpenic alcohol
α -Elemol	0.50	Sesquiterpenic alcohol
Germacrene B	0.03	Sesquiterpene
Sesquirosefuran?	0.03	Sesquiterpenic ether
β -Calacorene	0.17	Sesquiterpene
(<i>E</i>)-Nerolidol	0.04	Sesquiterpenic alcohol
(3 <i>Z</i>)-Hexenyl benzoate	0.05	Phenolic ester
Caryophyllene oxide isomer	0.15	Sesquiterpenic ether
Caryophyllene oxide	0.29	Sesquiterpenic ether
Globulol	0.22	Sesquiterpenic alcohol
Unknown	0.10	Sesquiterpenic alcohol
Unknown	0.09	Oxygenated sesquiterpene
Viridiflorol	0.10	Sesquiterpenic alcohol
Guaiol	0.12	Sesquiterpenic alcohol
Copaborneol	0.03	Sesquiterpenic alcohol
Humulene epoxide II	0.09	Sesquiterpenic ether
Junenol	0.27	Sesquiterpenic alcohol
1,10-diepi-Cubenol	0.13	Sesquiterpenic alcohol
1-epi-Cubenol	0.39	Sesquiterpenic alcohol
γ -Eudesmol	0.42	Sesquiterpenic alcohol
τ -Muurolol	0.91	Sesquiterpenic alcohol
Cubenol	0.34	Sesquiterpenic alcohol
τ -Cadinol	0.37	Sesquiterpenic alcohol
α -Muurolol	0.37	Sesquiterpenic alcohol
β -Eudesmol	0.19	Sesquiterpenic alcohol
Unknown	0.41	Sesquiterpenic alcohol
α -Cadinol	1.67	Sesquiterpenic alcohol
<i>trans</i> -Calamene-10-ol	0.04	Sesquiterpenic alcohol
Bulnesol	0.07	Sesquiterpenic alcohol
Unknown	0.15	Oxygenated sesquiterpene
(2 <i>E</i> ,6 <i>Z</i>)-Farnesol	0.02	Sesquiterpenic alcohol
(2 <i>E</i> ,6 <i>E</i>)-Farnesol	1.19	Sesquiterpenic alcohol
(2 <i>E</i> ,6 <i>E</i>)-Farnesal	0.04	Sesquiterpenic aldehyde
Benzyl benzoate	4.05	Phenolic ester
(2 <i>E</i> ,6 <i>E</i>)-Farnesyl acetate	0.44	Sesquiterpenic ester
Benzyl salicylate	0.45	Phenolic ester
Geranyl benzoate	0.24	Phenolic ester
Consolidated total	99.05	

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

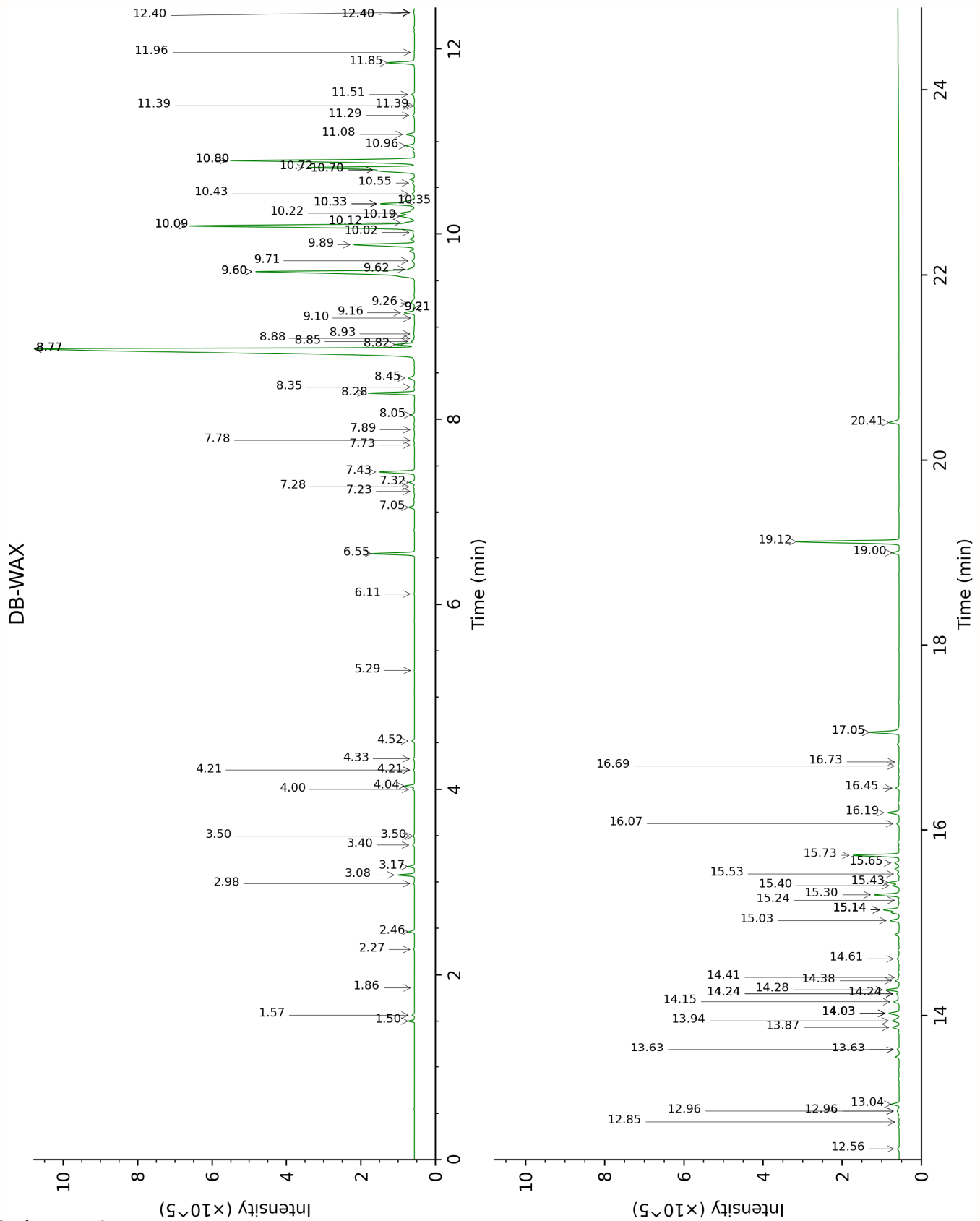
Note: no correction factor was applied

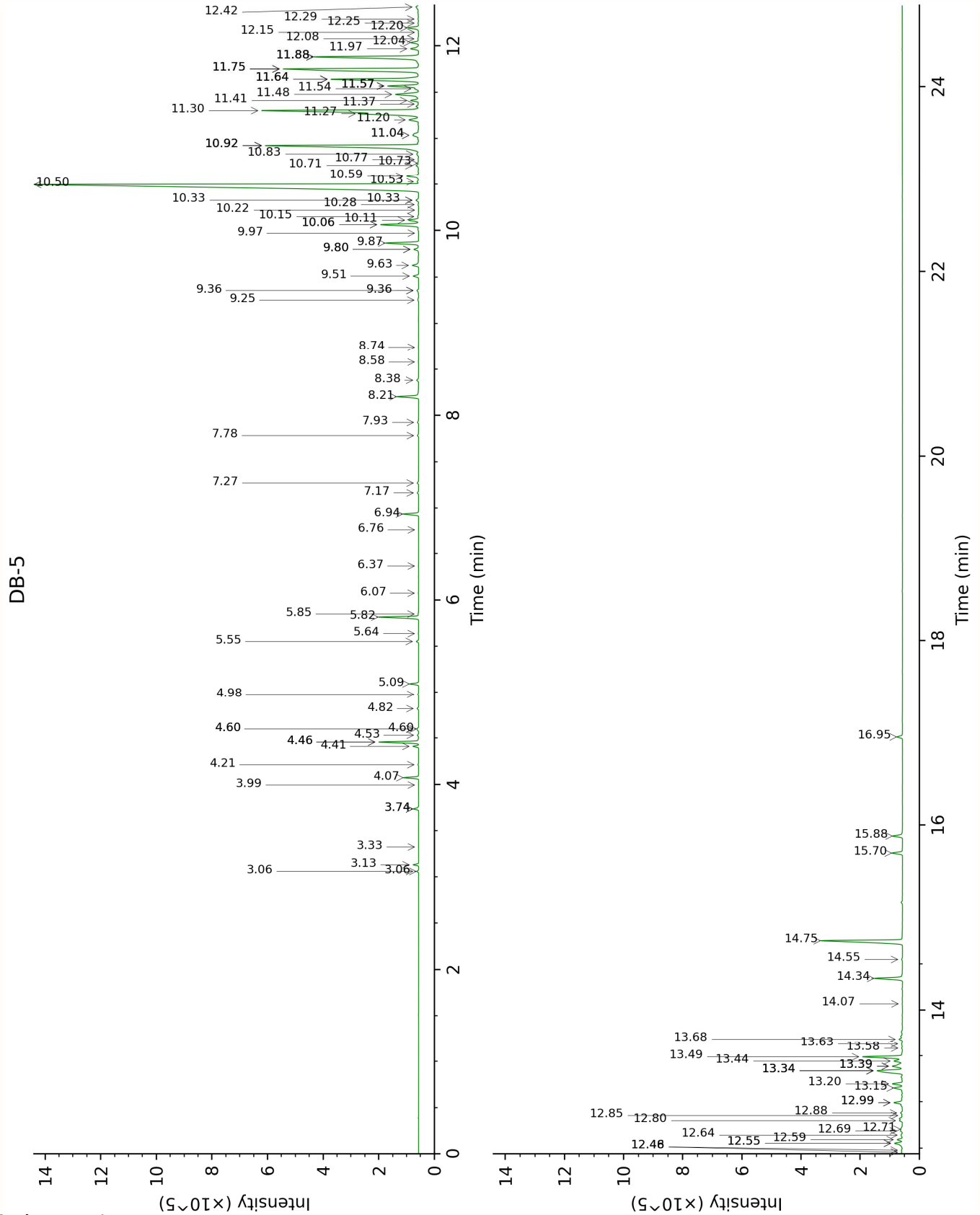
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm 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.

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





FULL ANALYSIS DATA

Prenyl acetate	Column DB-WAX			Column DB-5		
	4.21*	1218.3	[0.04]	3.06*	925.4	[0.07]
α -Thujene	1.57*†	999.3	[0.06]	3.06*	925.4	[0.07]
α -Pinene	1.50*†	992.2	[0.17]	3.13	930.1	0.18
Camphene	1.86	1027.3	tr	3.32	942.8	tr
Sabinene	2.46	1084.8	0.18	3.74*	969.9	[0.21]
β -Pinene	2.28	1066.7	0.03	3.74*	969.9	[0.21]
6-Methyl-5-hepten-2-one	5.29	1295.5	0.01	3.99	987.0	0.02
Myrcene	3.08	1133.5	0.52	4.07	992.2	0.52
α -Phellandrene	2.98	1126.5	0.03	4.21	1001.5	0.03
α -Terpinene	3.17	1140.4	0.20	4.41	1013.9	0.20
<i>para</i> -Methylanisole	6.55	1385.2	1.45	4.46*	1016.9	[1.41]
Hexyl acetate	4.52	1240.6	0.10	4.46*	1016.9	[1.41]
<i>para</i> -Cymene	4.33	1226.9	0.04	4.53	1021.5	0.05
1,8-Cineole	3.50*	1165.5	[0.05]	4.60*	1025.7	[0.10]
β -Phellandrene	3.50*	1165.5	[0.05]	4.60*	1025.7	[0.10]
Limonene	3.40	1158.2	0.06	4.60*	1025.7	[0.10]
(Z)- β -Ocimene	4.00	1203.4	0.06	4.82	1039.5	0.07
(E)- β -Ocimene	4.21*	1218.3	[0.04]	4.98	1049.3	0.03
γ -Terpinene	4.04	1205.9	0.33	5.09	1056.6	0.32
<i>para</i> -Cresol	14.24*	2019.1	[0.10]	5.55	1085.3	0.09
Methyl benzoate	8.88	1559.7	0.03	5.64	1090.6	0.02
Linalool	8.28	1513.7	1.53	5.82	1101.8	1.50
Nonanal	6.11	1354.3	0.01	5.85	1103.9	0.04
<i>cis-para</i> -Menth-2-en-1-ol	8.35	1518.7	0.02	6.07	1118.2	0.02
<i>trans-para</i> -Menth-2-en-1-ol	9.21*	1584.7	[0.04]	6.37	1136.9	0.01
Benzyl acetate	10.33*†	1674.4	[1.43]	6.76	1161.8	tr
Terpinen-4-ol	8.82	1554.6	0.69	6.94	1173.2	0.59
α -Terpineol	10.02	1649.6	0.10	7.16	1187.8	0.06
Methylchavicol	9.60*†	1615.8	[8.39]	7.27	1194.6	0.07
Nerol	11.28	1754.3	0.08	7.78	1228.4	0.05
Neral	9.71	1625.2	0.11	7.93	1237.9	0.06
Geraniol	11.85	1802.6	0.98	8.20	1256.5	0.90
Geranial	10.35*†	1676.0	[0.27]	8.38	1268.4	0.09
(E)-Anethole	11.39*	1763.0	[0.03]	8.58	1281.6	0.02
1-Nitro-2-phenylethane	14.41	2035.9	0.03	8.74	1292.5	0.02
Unknown CULA I [m/z 81, 79 (45), 91 (40), 67 (40), 69	7.28	1438.6	0.06	9.25	1327.8	0.05

939), 93 (39)... 204? (6)]						
Benzyl butyrate	11.96	1812.4	0.01	9.36*	1335.1	[0.09]
δ-Elemene	7.23	1434.9	0.04	9.36*	1335.1	[0.09]
α-Cubebene	7.05	1422.2	0.21	9.51	1346.0	0.22
Eugenol	15.02	2094.9	0.35	9.63	1354.1	0.30
α-Ylangene	7.32	1442.0	0.20	9.80*	1366.3	[0.23]
Neryl acetate	10.43	1682.9	0.10	9.80*	1366.3	[0.23]
α-Copaene	7.44	1450.3	1.35	9.87	1371.0	1.36
β-Bourbonene	7.73	1471.7	0.02	9.97	1378.5	0.01
β-Cubebene	8.05	1495.8	0.13	10.06*	1385.0	[1.67]
Geranyl acetate	10.80*	1713.4	[7.98]	10.06*	1385.0	[1.67]
β-Elemene	8.77*	1551.0	[31.95]	10.11	1388.4	0.47
Cyperene	7.78	1475.4	0.05	10.15	1391.1	0.04
Vanillin				10.22	1396.0	0.01
Isocaryophyllene	8.45	1526.3	0.29	10.28	1400.2	0.03
Methyleugenol	13.63*	1961.9	[0.08]	10.33*	1403.5	[0.13]
α-Gurjunene	7.89	1483.9	0.03	10.33*	1403.5	[0.13]
β-Caryophyllene	8.77*	1551.0	[31.95]	10.50	1416.2	31.31
Caryophylla- 4(12),8(13)-diene	8.93	1563.4	0.05	10.53	1418.5	0.07
β-Copaene	8.77*	1551.0	[31.95]	10.59	1423.0	0.53
Aromadendrene	8.85	1557.1	0.10	10.71	1431.8	0.13
α-Guaiene	8.77*	1551.0	[31.95]	10.73	1433.8	0.04
Isogermacrene D	9.21*	1584.7	[0.04]	10.77	1436.6	0.03
<i>trans</i> -Muuro-la-3,5- diene	9.16	1580.9	0.40	10.83	1441.0	0.12
(<i>E</i>)-Isoeugenol	16.74	2268.1	0.02	10.92*	1447.9	[8.22]
α-Patchoulene	9.10	1576.4	0.01	10.92*	1447.9	[8.22]
α-Humulene	9.60*†	1615.8	[8.39]	10.92*	1447.9	[8.22]
<i>cis</i> -Muuro-la- 4(15),5-diene	9.62*†	1617.8	[0.15]	11.04*	1456.2	[0.44]
<i>cis</i> -Cadina-1(6),4- diene	9.26	1588.9	0.14	11.04*	1456.2	[0.44]
<i>trans</i> -Cadina- 1(6),4-diene	9.60*†	1615.8	[8.39]	11.20	1468.5	0.50
γ-Muuro-lene	9.89	1639.1	2.68	11.27	1473.4	2.67
Germacrene D	10.09*	1655.2	[11.55]	11.30	1476.0	7.83
<i>trans</i> -Muuro-la- 4(15),5-diene	10.12	1658.0	0.17	11.37	1481.2	0.02
Pre-nyl benzoate	14.02*	1998.8	[0.44]	11.41	1484.1	0.34
Bicyclo-germacrene	10.33*†	1674.4	[1.43]	11.48	1489.0	1.26
Methyl (<i>E</i>)- isoeugenol	15.24	2116.6	0.05	11.54	1493.5	0.14
α-Muuro-lene	10.33*†	1674.4	[1.43]	11.57*	1495.7	[1.36]

(3Z,6E)- α -Farnesene	10.55	1692.3	0.09	11.57*	1495.7	[1.36]
Unknown CAOD II [m/z 119, 41 (95), 123 (53), 80 (49), 161 (44), 105 (42)... 204 (2)]				11.57*	1495.7	[1.36]
Unknown CAOD III, not seen in MS	10.09*	1655.2	[11.55]	11.64*	1501.1	[4.25]
δ -Guaiene	10.19	1663.7	0.73	11.64*	1501.1	[4.25]
δ -Amorphene	10.22	1666.2	0.61	11.64*	1501.1	[4.25]
Cubebol	12.85	1890.2	0.02	11.75*	1509.8	[7.78]
γ -Cadinene	10.70*	1704.8	[1.50]	11.75*	1509.8	[7.78]
(3E,6E)- α -Farnesene	10.80*	1713.4	[7.98]	11.75*	1509.8	[7.78]
Zonarene	10.70*	1704.8	[1.50]	11.88*	1520.1	[5.05]
<i>trans</i> -Calamenene	11.51	1773.3	0.12	11.88*	1520.1	[5.05]
δ -Cadinene	10.72	1707.0	4.47	11.88*	1520.1	[5.05]
<i>trans</i> -Cadina-1,4- diene	10.96	1726.8	0.37	11.97	1526.9	0.38
α -Cadinene	11.08	1737.1	0.31	12.04	1532.2	0.33
α -Calacorene	12.40*	1850.5	[0.07]	12.08	1535.3	0.05
<i>cis</i> -Dracunculifolol	12.40*	1850.5	[0.07]	12.15	1540.8	0.01
α -Elemol	14.28	2023.1	0.48	12.20	1544.6	0.50
Germacrene B	11.39*	1763.0	[0.03]	12.25	1548.6	0.03
Sesquirosefuran?	12.40*	1850.5	[0.07]	12.29	1552.1	0.03
β -Calacorene	12.96*	1900.9	[0.14]	12.42	1562.3	0.17
(E)-Nerolidol	14.02*	1998.8	[0.44]	12.46	1564.9	0.04
(3Z)-Hexenyl benzoate	14.61	2055.1	0.09	12.48	1566.7	0.05
Caryophyllene oxide isomer	12.96*	1900.9	[0.14]	12.55*	1572.6	[0.44]
Caryophyllene oxide	13.04	1907.7	0.29	12.55*	1572.6	[0.44]
Globulol	14.15	2010.8	0.26	12.59	1575.6	0.22
Unknown cadinol or muurolol analog [m/z 161, 119 (77), 120 (76), 105 (73), 93 (57)... 204 (36)]	12.56	1864.6	0.07	12.64	1579.5	0.10
Unknown MECA III [m/z 161, 105 (84), 43 (80), 119 (72), 93 (62), 121 (54)...]	14.24*	2019.1	[0.10]	12.69	1583.1	0.09

204 (38), 222 (2)]						
Viridiflorol	14.24*	2019.1	[0.10]	12.71	1584.5	0.10
Guaiol	14.38	2032.5	0.16	12.80	1591.7	0.12
Copaborneol	15.14*	2106.4	[0.64]	12.85	1596.0	0.03
Humulene epoxide II	13.63*	1961.9	[0.08]	12.88	1598.3	0.09
Junenol	13.87	1984.4	0.27	12.99*	1607.3	[0.40]
1,10-diepi-Cubenol	14.02*	1998.8	[0.44]	12.99*	1607.3	[0.40]
1-epi-Cubenol	14.02*	1998.8	[0.44]	13.15	1620.4	0.39
γ-Eudesmol	15.14*	2106.4	[0.64]	13.20	1624.1	0.42
τ-Muurolol	15.30	2122.5	0.91	13.34*	1635.8	[1.62]
Cubenol	13.94	1991.1	0.34	13.34*	1635.8	[1.62]
τ-Cadinol	15.14*	2106.4	[0.64]	13.34*	1635.8	[1.62]
α-Muurolol	15.43	2135.5	0.37	13.39*	1639.8	[0.61]
β-Eudesmol	15.65	2156.6	0.19	13.39*	1639.8	[0.61]
Unknown cadinol analog II [m/z 95, 121 (73), 43 (57), 79 (43), 161 (43), 109 (40)... 204 (35), 222 (2)]	15.40	2132.2	0.23	13.44	1644.4	0.41
α-Cadinol	15.73	2164.8	1.64	13.49	1648.3	1.67
trans-Calamenen-10-ol	17.05*	2301.7	[1.20]	13.58	1656.0	0.04
Bulnesol	15.53	2144.7	0.08	13.63	1659.9	0.07
Unknown CAOD I [m/z 123, 95 (31), 81 (29), 105 (27)... 222 (5)]	16.45	2238.9	0.13	13.68	1664.3	0.15
(2E,6Z)-Farnesol	16.69	2263.5	0.05	14.07	1696.0	0.02
(2E,6E)-Farnesol	17.05*	2301.7	[1.20]	14.34	1719.6	1.19
(2E,6E)-Farnesal	16.07	2199.2	0.09	14.55	1737.2	0.04
Benzyl benzoate	19.12	2529.8	4.07	14.75	1754.7	4.05
(2E,6E)-Farnesyl acetate	16.19	2211.5	0.46	15.70	1838.4	0.44
Benzyl salicylate	20.41	2681.9	0.43	15.88	1855.1	0.45
Geranyl benzoate	19.00	2515.9	0.25	16.95	1954.5	0.24
Total reported		96.92%			98.40%	

*: 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.

Essential Oil, *Cananga odorata var. macrophylla* (Cananga)

Internal code: 24H16-PTH03

Cananga - Indonesia - CR3103R

Report prepared for:

Plant Therapy

Note: no correction factor was applied

R.T.: Retention time (minutes)

R.I.: Retention index

Laboratoire
PhytoChemia

Plus que des analyses... des conseils