

Date : 2024-10-07

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24I24-PTH05

Customer Identification : Copaiba Oleoresin - Brazil - CJ0118R

Type : Resin

Source : *Copaifera officinalis*

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

Date : 2024-10-07

PHYSICOCHEMICAL DATA

Refractive index : 1.5054 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2024-09-26

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
Myrcene	0.01	Monoterpene
(2E,4E)-3,7-Dimethylocta-2,4-diene?	0.02	Monoterpene
(Z)- β -Ocimene	0.11	Monoterpene
(E)- β -Ocimene	0.01	Monoterpene
γ -Terpinene	0.01	Monoterpene
allo-Ocimene	0.02	Monoterpene
δ -Elemene isomer	0.02	Sesquiterpene
δ -Elemene	0.50	Sesquiterpene
α -Cubebene	0.45	Sesquiterpene
Cyclosativene I	0.02	Sesquiterpene
Cyclosativene II	0.02	Sesquiterpene
α -Ylangene	0.07	Sesquiterpene
α -Copaene	3.63	Sesquiterpene
<i>cis</i> - β -Elemene	0.02	Sesquiterpene
β -Cubebene	0.41	Sesquiterpene
β -Elemene	0.88	Sesquiterpene
Cyperene	0.32	Sesquiterpene
α -Gurjunene	0.04	Sesquiterpene
Sesquithujene	0.01	Sesquiterpene
β -Caryophyllene	41.99	Sesquiterpene
β -Copaene	0.10	Sesquiterpene
γ -Elemene	0.26	Sesquiterpene
<i>trans</i> - α -Bergamotene	4.76	Sesquiterpene
β -Humulene	0.07	Sesquiterpene
Sesquisabinene A	0.26	Sesquiterpene
epi- β -Santalene	0.09	Sesquiterpene
α -Humulene	5.74	Sesquiterpene
allo-Aromadendrene	0.32	Sesquiterpene
<i>cis</i> -Muurola-4(15),5-diene	0.04	Sesquiterpene
(E)- β -Farnesene	0.28	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.06	Sesquiterpene
Selina-4,11-diene	0.09	Sesquiterpene
γ -Muurolene	1.36	Sesquiterpene
Germacrene D	4.50	Sesquiterpene
β -Selinene	0.52	Sesquiterpene
ar-Curcumene	0.38	Sesquiterpene
<i>trans</i> -Muurola-4(15),5-diene	0.05	Sesquiterpene
δ -Selinene	0.06	Sesquiterpene
α -Selinene	0.37	Sesquiterpene
Bicyclogermacrene	0.47	Sesquiterpene

epi-Cubebol	0.05	Sesquiterpenic alcohol
Caparratriene	0.11	Sesquiterpene
α -Muurolene	0.34	Sesquiterpene
δ -Guaiene	0.30	Sesquiterpene
(3E,6E)- α -Farnesene	0.06	Sesquiterpene
β -Bisabolene	2.61	Sesquiterpene
γ -Cadinene	0.26	Sesquiterpene
Cubebol	0.05	Sesquiterpenic alcohol
Zonarene	0.21	Sesquiterpene
β -Sesquiphellandrene	0.11	Sesquiterpene
<i>trans</i> -Calamenene	0.05	Sesquiterpene
δ -Cadinene	1.87	Sesquiterpene
β -Ylangene	0.01	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.19	Sesquiterpene
α -Cadinene	0.09	Sesquiterpene
α -Calacorene	0.04	Sesquiterpene
(E)- α -Bisabolene	0.28	Sesquiterpene
Isocaryophyllene epoxide B	0.02	Sesquiterpenic ether
Germacrene B	1.28	Sesquiterpene
Maaliol	0.05	Sesquiterpenic alcohol
Caryophyllenyl alcohol	0.42	Sesquiterpenic alcohol
Spathulenol	0.04	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.03	Sesquiterpenic ether
Caryophyllene oxide	0.19	Sesquiterpenic ether
Globulol	0.06	Sesquiterpenic alcohol
Viridiflorol	0.06	Sesquiterpenic alcohol
Humulene epoxide I	0.01	Sesquiterpenic ether
Ledol	0.12	Sesquiterpenic alcohol
Junenol	0.59	Sesquiterpenic alcohol
Unknown	0.04	Oxygenated sesquiterpene
Rosifoliol	0.03	Sesquiterpenic alcohol
1-epi-Cubenol	0.11	Sesquiterpenic alcohol
Caryophylladienol II	0.04	Sesquiterpenic alcohol
τ -Muurolol	0.25	Sesquiterpenic alcohol
τ -Cadinol	0.20	Sesquiterpenic alcohol
α -Muurolol	0.37	Sesquiterpenic alcohol
Unknown	0.07	Oxygenated sesquiterpene
Unknown	0.06	Sesquiterpenic alcohol
α -Cadinol	0.32	Sesquiterpenic alcohol
Selin-11-en-4 α -ol	0.07	Sesquiterpenic alcohol
<i>trans</i> -Calamenen-10-ol	0.03	Sesquiterpenic alcohol
Cadalene	0.06	Sesquiterpene
Germacra-4(15),5,10(14)-trien-1 α -ol	0.05	Sesquiterpenic alcohol
α -Bisabolol	0.04	Sesquiterpenic alcohol
Juniper camphor	0.15	Sesquiterpenic alcohol

Aromadendrane-4,10-diol	0.01	Sesquiterpenic alcohol
Unknown	0.02	Oxygenated diterpene
Unknown	0.09	Diterpene
Unknown	0.03	Oxygenated diterpene
Unknown	0.14	Oxygenated diterpene
Palmitic acid	0.03	Aliphatic acid
Unknown	0.02	Oxygenated diterpene
Kaur-16-ene?	0.13	Diterpene
<i>cis</i> -3,14-Clerodadien-13-ol	0.08	Diterpenic alcohol
Manool	0.24	Diterpenic alcohol
Kolavelool	0.52	Diterpenic alcohol
Linoleic acid	0.06	Aliphatic acid
Oleic acid	0.03	Aliphatic acid
3 α -Hydroxymanool	1.18	Diterpenic alcohol
Copalol	0.62	Diterpenic alcohol
Kolavenol	0.74	Diterpenic alcohol
Methyl copalate?	0.27	Diterpenic ester
Copaifera diterpenic acid I	4.41	Diterpenic acid
Methyl kolavenate	0.30	Diterpenic ester
Copaifera diterpenic acid II	1.53	Diterpenic acid
Kolavenyl acetate?	0.10	Diterpenic ester
Methyl hardwickiiate?	0.15	Diterpenic ester
Copaifera diterpenic acid III	0.16	Diterpenic acid
Copaifera diterpenic acid IV	1.68	Diterpenic acid
Copaifera diterpenic acid IX	0.37	Diterpenic acid
Copaifera diterpenic acid VI	0.91	Diterpenic acid
Copaifera diterpenic acid VII	1.42	Diterpenic acid
Copaifera diterpenic acid VIII	0.19	Diterpenic acid
Consolidated total	95.13	

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

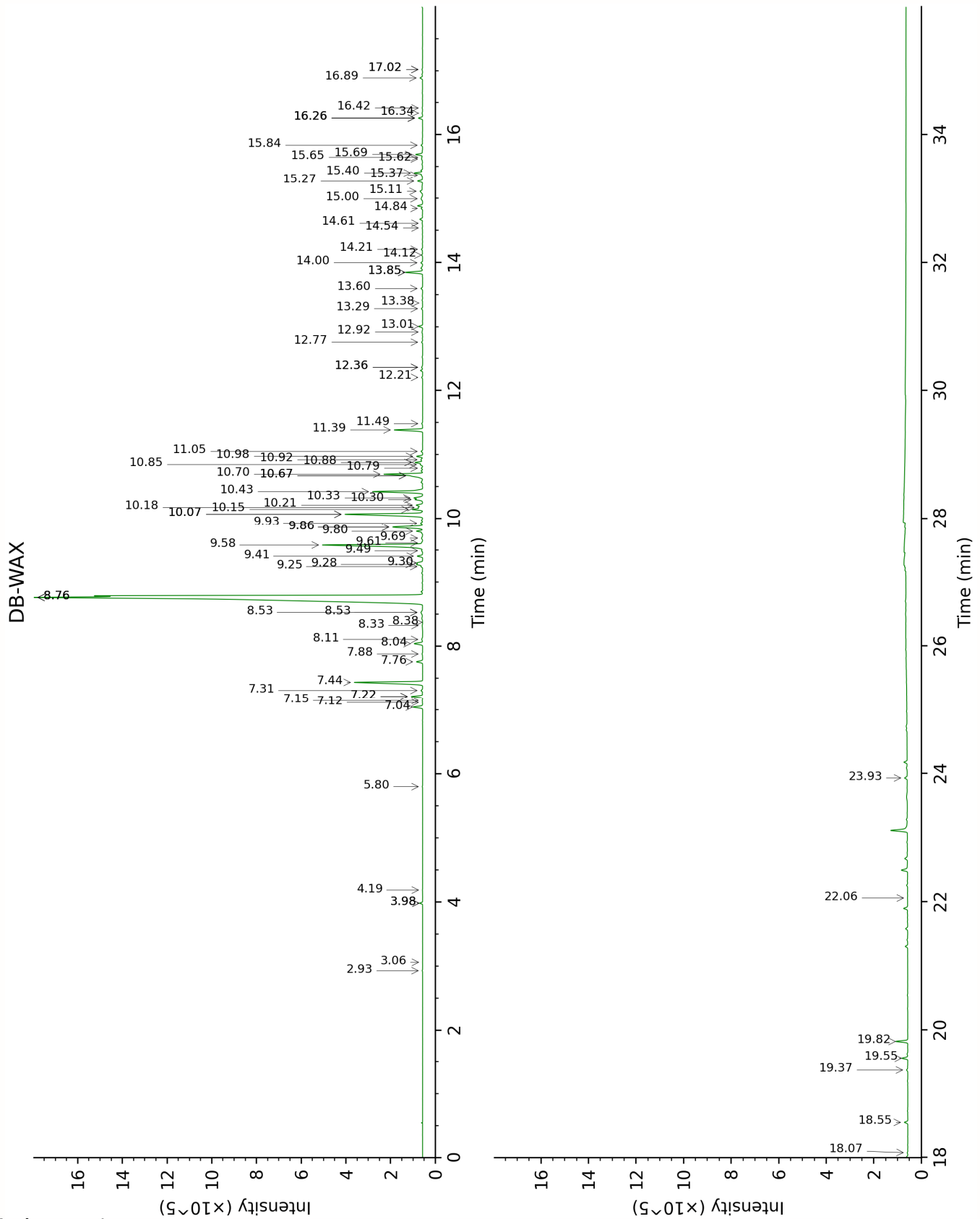
Note: no correction factor was applied

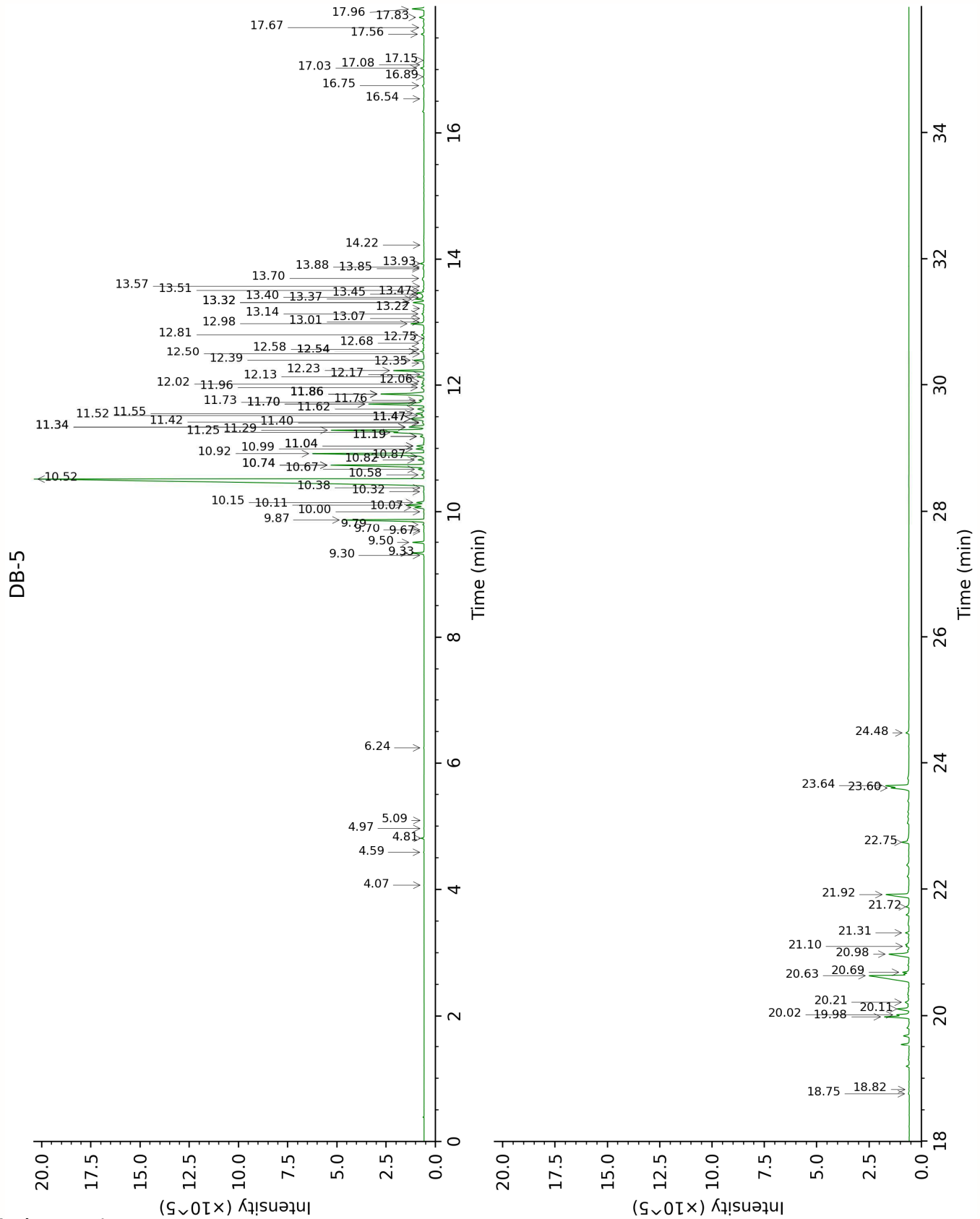
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

Myrcene	Column DB-WAX			Column DB-5		
	3.06	1134.0	tr	4.07	992.3	0.01
(2E,4E)-3,7-Dimethylocta-2,4-diene?	2.93	1124.1	0.02	4.59	1025.5	0.02
(Z)- β -Ocimene	3.98*	1202.9	[0.12]	4.81	1039.4	0.11
(E)- β -Ocimene	4.19	1217.3	0.01	4.97	1049.1	0.01
γ -Terpinene	3.98*	1202.9	[0.12]	5.10	1057.1	0.01
allo-Ocimene	5.80	1333.3	0.02	6.24	1129.5	0.02
δ -Elemene isomer	7.12	1428.6	0.01	9.30	1332.0	0.02
δ -Elemene	7.22*	1435.8	[0.54]	9.33	1334.6	0.50
α -Cubebene	7.04	1423.1	0.50	9.50	1346.6	0.45
Cyclosativene I	7.15	1430.9	0.02	9.67	1358.5	0.02
Cyclosativene II	7.22*	1435.8	[0.54]	9.70	1360.5	0.02
α -Ylangene	7.31	1442.9	0.09	9.79	1366.7	0.07
α -Copaene	7.44	1452.3	3.96	9.87	1372.3	3.63
cis- β -Elemene	8.53*	1534.8	[0.19]	10.00	1381.5	0.02
β -Cubebene	8.04	1497.2	0.48	10.07	1386.3	0.41
β -Elemene	8.76*†	1552.9	[40.53]	10.10	1388.9	0.88
Cyperene	7.76	1476.1	0.32	10.15	1391.8	0.32
α -Gurjunene	7.88	1485.1	0.03	10.32	1404.0	0.04
Sesquithujene	8.33	1519.1	0.05	10.38	1408.5	0.01
β -Caryophyllene	8.76*†	1552.9	[40.53]	10.52	1418.8	41.99
β -Copaene	8.53*	1534.8	[0.19]	10.58	1423.8	0.10
γ -Elemene	9.30	1594.4	0.27	10.67	1430.4	0.26
trans- α -Bergamotene	8.76*†	1552.9	[40.53]	10.74*	1435.2	[4.83]
β -Humulene	8.11	1502.3	0.07	10.74*	1435.2	[4.83]
Sesquisabinene A	9.41	1603.0	0.26	10.82	1441.4	0.26
epi- β -Santalene	9.25	1590.1	0.07	10.87	1445.4	0.09
α -Humulene	9.58	1617.1	6.42	10.92	1448.8	5.74
allo-Aromadendrene	9.28	1592.7	0.32	10.99	1454.2	0.32
cis-Muurolo-4(15),5-diene	9.61	1619.6	0.04	11.04*	1457.8	[0.33]
(E)- β -Farnesene	9.80	1634.6	0.28	11.04*	1457.8	[0.33]
trans-Cadina-1(6),4-diene	9.49	1609.9	0.06	11.19*	1469.0	[0.18]
Selina-4,11-diene	9.69	1625.8	0.09	11.19*	1469.0	[0.18]
γ -Muurolole	9.86*	1639.8	[1.83]	11.25	1473.7	1.36
Germacrene D	10.07*	1656.6	[4.93]	11.29	1476.3	4.50
β -Selinene	10.15	1662.7	0.52	11.34*	1480.0	[0.87]
ar-Curcumene	10.88	1723.2	0.38	11.34*	1480.0	[0.87]
trans-Muurolo-	10.07*	1656.6	[4.93]	11.40	1484.8	0.05

4(15),5-diene						
δ-Selinene	9.86*	1639.8	[1.83]	11.42	1485.9	0.06
α-Selinene	10.21	1668.1	0.37	11.47*	1489.8	[0.83]
Bicyclogermacrene	10.33	1677.2	0.47	11.47*	1489.8	[0.83]
epi-Cubebol	12.21	1837.3	0.05	11.47*	1489.8	[0.83]
Caparratriene	9.93	1645.2	0.11	11.52	1493.6	0.11
α-Murolene	10.30	1675.2	0.36	11.55	1495.9	0.34
δ-Guaiene	10.18	1665.0	0.21	11.62	1501.3	0.30
(3E,6E)-α-Farnesene	10.79	1715.7	0.06	11.70*	1507.4	[2.63]
β-Bisabolene	10.42	1685.2	2.61	11.70*	1507.4	[2.63]
γ-Cadinene	10.67*	1705.9	[0.48]	11.73*†	1509.5	[0.11]
Cubebol	12.77	1886.7	0.05	11.76*†	1512.0	[0.20]
Zonarene	10.67*	1705.9	[0.48]	11.86*	1519.8	[2.26]
β-Sesquiphellandrene	10.85	1720.5	0.11	11.86*	1519.8	[2.26]
trans-Calamenene	11.49	1774.5	0.05	11.86*	1519.8	[2.26]
δ-Cadinene	10.70	1707.7	1.87	11.86*	1519.8	[2.26]
β-Ylangene	8.38	1522.9	0.01			
trans-Cadina-1,4-diene	10.92	1726.9	0.12	11.96	1527.9	0.19
α-Cadinene	11.05	1737.8	0.07	12.02	1532.2	0.09
α-Calacorene	12.36*	1851.2	[0.07]	12.06	1535.5	0.04
(E)-α-Bisabolene	10.98	1731.4	0.28	12.13	1541.1	0.28
Isocaryophyllene epoxide B	12.36*	1851.2	[0.07]	12.17	1544.0	0.02
Germacrene B	11.39	1766.1	1.39	12.23	1549.0	1.28
Maaliol	13.29	1934.5	0.07	12.35	1558.3	0.05
Caryophyllenyl alcohol	13.85*	1986.3	[0.90]	12.40	1561.7	0.42
Spathulenol	14.61	2059.3	0.04	12.50	1569.7	0.04
Caryophyllene oxide isomer	12.92	1901.0	0.03	12.54*	1573.3	[0.21]
Caryophyllene oxide	13.01	1909.0	0.19	12.54*	1573.3	[0.21]
Globulol	14.12	2012.0	0.05	12.58	1576.3	0.06
Viridiflorol	14.21	2020.5	0.06	12.68	1583.7	0.06
Humulene epoxide I	13.38	1942.5	0.01	12.75	1589.6	0.01
Ledol	13.60	1963.3	0.09	12.81	1594.1	0.12
Junenol	13.85*	1986.3	[0.90]	12.98	1608.1	0.59
Unknown MECA V [m/z 179, 161 (66), 119 (44), 95 (38), 105 (35)... 204 (24), 222 (1)]	14.84	2081.5	0.07	13.01	1610.3	0.04

Rosifoliol	14.54	2052.4	0.03	13.07	1614.9	0.03
1-epi-Cubenol	14.00	2000.4	0.09	13.14	1620.9	0.11
Caryophylladienol II	16.26*	2223.9	[0.20]	13.22	1628.0	0.04
τ-Muurolol	15.27	2123.7	0.25	13.32*	1635.6	[0.56]
τ-Cadinol	15.11	2107.8	0.20	13.32*	1635.6	[0.56]
α-Muurolol	15.40	2137.0	0.40	13.37	1640.3	0.37
Unknown COOF I [m/z 121, 95 (50), 59 (46), 93 (41), 81 (36), 67 (36)... 206 (18), 220? (1)]	15.00	2096.3	0.15	13.40	1642.4	0.07
Unknown cadinol analog II [m/z 95, 121 (73), 43 (57), 79 (43), 161 (43), 109 (40)... 204 (35), 222 (2)]	15.37	2133.6	0.06	13.45	1646.7	0.06
α-Cadinol	15.69	2165.9	0.35	13.47	1648.2	0.32
Selin-11-en-4α-ol	15.84	2180.3	0.08	13.51	1651.5	0.07
trans-Calamenen- 10-ol	17.02*	2303.0	[0.04]	13.57	1656.8	0.03
Cadalene	15.62	2158.8	0.08	13.70	1667.1	0.06
Germacra- 4(15),5,10(14)-trien- 1α-ol	16.26*	2223.9	[0.20]	13.85	1679.7	0.05
α-Bisabolol	15.65	2161.4	0.04	13.88	1681.8	0.04
Juniper camphor	16.26*	2223.9	[0.20]	13.93	1686.4	0.15
Aromadendrane- 4,10-diol	17.02*	2303.0	[0.04]	14.22	1710.8	0.01
Unknown COOF II [m/z 43, 95 (66), 81 (63), 137 (61), 41 (53), 107 (47)... 262 (6)...]	18.07	2417.4	0.03	16.54	1917.9	0.02
Unknown COOF III [m/z 95, 105 (79), 107 (75), 189 (68), 41 (64), 81 (61)... 257 (12), 272 (2)]	16.42	2240.1	0.03	16.75	1937.8	0.09
Unknown COOF IV [m/z 43, 95 (98), 107 (84), 93 (55), 121 (53)... 262 (7)...]	18.55	2470.3	0.17	16.89	1951.1	0.03
Unknown COOF V [m/z 95, 107 (61),				17.03	1964.1	0.14

191 (46), 121 (45)...						
Palmitic acid	22.06	2895.2	0.01	17.08	1969.1	0.03
Unknown COOF VI [m/z 95, 107 (27), 81 (19), 191 (17), 55 (16)... 275 (1)...	16.34	2231.9	0.04	17.15	1975.8	0.02
Kaur-16-ene?	16.89	2288.8	0.14	17.56	2015.6	0.13
cis-3,14- Clerodadien-13-ol	19.37	2564.2	0.07	17.67	2026.0	0.08
Manool	19.55	2585.3	0.28	17.83	2042.1	0.24
Kolavelool	19.82	2617.8	0.58	17.96	2055.5	0.52
Linoleic acid				18.75	2135.2	0.06
Oleic acid	23.93	3147.3	0.14	18.82	2142.2	0.03
3 α -Hydroxymanool				19.98	2265.1	1.18
Copalol				20.02	2268.5	0.62
Kolavenol				20.11	2278.6	0.74
Methyl copalate?				20.22	2290.0	0.27
Copaifera diterpenic acid I				20.63	2336.5	4.41
Methyl kolavenate				20.69	2342.7	0.30
Copaifera diterpenic acid II				20.98	2374.8	1.53
Kolavenyl acetate?				21.10	2388.6	0.10
Methyl hardwickiite?				21.31	2413.0	0.15
Copaifera diterpenic acid III				21.72	2460.9	0.16
Copaifera diterpenic acid IV				21.92	2483.5	1.68
Copaifera diterpenic acid IX				22.75	2582.9	0.37
Copaifera diterpenic acid VI				23.60	2689.5	0.91
Copaifera diterpenic acid VII				23.64	2694.1	1.42
Copaifera diterpenic acid VIII				24.48	2802.0	0.19
Total reported		87.18%			95.17%	

*: 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