

Date : 2025-10-14

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25I10-PTH01

Customer Identification : Sandalwood Indian - India - SA2109R

Type : Essential Oil

Source : *Santalum album*

Customer : Plant Therapy

Checked and approved by:

Sylvain Mercier, M. Sc., Chimiste 2014-005

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia. This report is digitally signed, it is only considered valid if the digital signature is intact. The results only describe the samples that were submitted to the assays.

This report is an update of the version first issued on September 17, 2025 to correct a mistake in the sample identification section.



Laboratoire
PhytoChemia

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 : 2025-09-11

PHYSICOCHEMICAL DATA

Refractive index : 1.506 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2025-09-12

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
Santene	0.03	Normonoterpene
Tricyclene	tr	Monoterpene
Linalool	0.01	Monoterpenic alcohol
Sabinaketone	0.01	Normonoterpenic ketone
4-Methylacetophenone	0.02	Simple phenolic
Teresantalol?	0.01	Monoterpenic alcohol
Unknown	0.02	Terpene derivative
Teresantalic acid	0.13	Monoterpenic acid
Unknown	0.01	Terpenic aldehyde
Tricycloekasantalal	0.09	Terpenic aldehyde
(1S,5S,6R)-2,6-Dimethylbicyclo[3.1.1]hept-2-ene-6-propanal?	0.02	Terpenic aldehyde
Unknown	0.03	Unknown
7-epi-Sesquithujene	0.02	Sesquiterpene
γ -4-Dimethylbenzenebutyral	0.01	Simple phenolic
α -Cedrene	0.01	Sesquiterpene
β -Cedrene	0.02	Sesquiterpene
α -Santalene	1.06	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.25	Sesquiterpene
Unknown	0.01	Sesquiterpene
epi- β -Santalene	0.88	Sesquiterpene
α -Acoradiene	0.02	Sesquiterpene
β -Santalene	1.42	Sesquiterpene
β -Acoradiene	0.02	Sesquiterpene
Unknown	0.03	Unknown
γ -Curcumene	0.09	Sesquiterpene
Unknown	0.06	Sesquiterpene
α -Curcumene	0.15	Sesquiterpene
Unknown	0.01	Sesquiterpene
α -Alaskene	0.02	Sesquiterpene
β -Bisabolene	0.08	Sesquiterpene
β -Curcumene	0.29	Sesquiterpene
Unknown	0.25	Oxygenated sesquiterpene
β -Sesquiphellandrene	0.02	Sesquiterpene
Unknown	0.27	Sesquiterpene
Unknown	0.18	Sesquiterpene
(E)-Nerolidol	0.05	Sesquiterpenic alcohol
Unknown	0.01	Oxygenated sesquiterpene
Dendrolasin	0.05	Sesquiterpenic ether
Humulene epoxide I	0.07	Sesquiterpenic ether

Helifolen-12-al A	0.02	Sesquiterpenic aldehyde
Guaiol	0.01	Sesquiterpenic alcohol
Helifolen-12-al B	0.02	Sesquiterpenic aldehyde
Unknown	0.09	Oxygenated sesquiterpene
Rosifoliol	0.01	Sesquiterpenic alcohol
α -Acorenol	0.03	Sesquiterpenic alcohol
β -Acorenol	0.18	Sesquiterpenic alcohol
β -Eudesmol	0.05	Sesquiterpenic alcohol
Unknown	0.62	Oxygenated sesquiterpene
α -Bisabolol oxide B, epimer 1	0.12	Sesquiterpenic alcohol
α -Bisabolol oxide B, epimer 2	0.36	Sesquiterpenic alcohol
Unknown	0.37	Oxygenated sesquiterpene
Unknown	0.05	Oxygenated sesquiterpene
Bulnesol	0.12	Sesquiterpenic alcohol
epi- β -Bisabolol	0.54	Sesquiterpenic alcohol
β -Bisabolol	0.31	Sesquiterpenic alcohol
epi-Cyclosantalol	0.24	Sesquiterpenic aldehyde
(Z)- α -Santalol	46.52	Sesquiterpenic alcohol
(E)- α -Santalol	1.07	Sesquiterpenic aldehyde
α -Bisabolol	0.08	Sesquiterpenic alcohol
Unknown FRAG MCDXXXIII [m/z 95, 94 (90), 93 (58), 123 (53), 121 (49)...]	0.28	Unknown
(Z)- α -trans-Bergamotol	6.67	Sesquiterpenic alcohol
(E)- α -Santalol	0.78	Sesquiterpenic alcohol
(Z)-epi- β -Santalol	2.97	Sesquiterpenic alcohol
(E)- α -trans-Bergamotol	0.39	Sesquiterpenic alcohol
(Z)- α -Santalyl formate?	0.37	Sesquiterpenic ester
(Z)- β -Santalol	20.87	Sesquiterpenic alcohol
(2E,6E)-Farnesol	0.50	Sesquiterpenic alcohol
Unknown	0.17	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
(Z)- γ -Curcumen-12-ol	0.34	Sesquiterpenic alcohol
(Z)-Nuciferol	0.50	Sesquiterpenic alcohol
Unknown	0.84	Oxygenated sesquiterpene
(E)- β -Santalol	1.74	Sesquiterpenic alcohol
Unknown	0.48	Oxygenated sesquiterpene
Curcumen-12-ol analog	0.14	Sesquiterpenic alcohol
(Z)- β -Curcumen-12-ol	0.55	Sesquiterpenic alcohol
(Z)-Lanceol	1.78	Sesquiterpenic alcohol
Unknown	0.12	Oxygenated sesquiterpene
(Z)- α -Santalyl acetate	0.07	Sesquiterpenic ester
Unknown	0.09	Oxygenated sesquiterpene
Unknown	0.10	Oxygenated sesquiterpene
Bisabola-2,7(Z),10(Z)-trien-13-ol?	0.16	Oxygenated sesquiterpene
Unknown	0.07	Oxygenated sesquiterpene

Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.13	Oxygenated sesquiterpene
Unknown	0.04	Unknown
Unknown	0.04	Unknown
Unknown	0.05	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.11	Oxygenated sesquiterpene
Unknown	0.04	Unknown
Consolidated total	96.98	

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

Note: no correction factor was applied

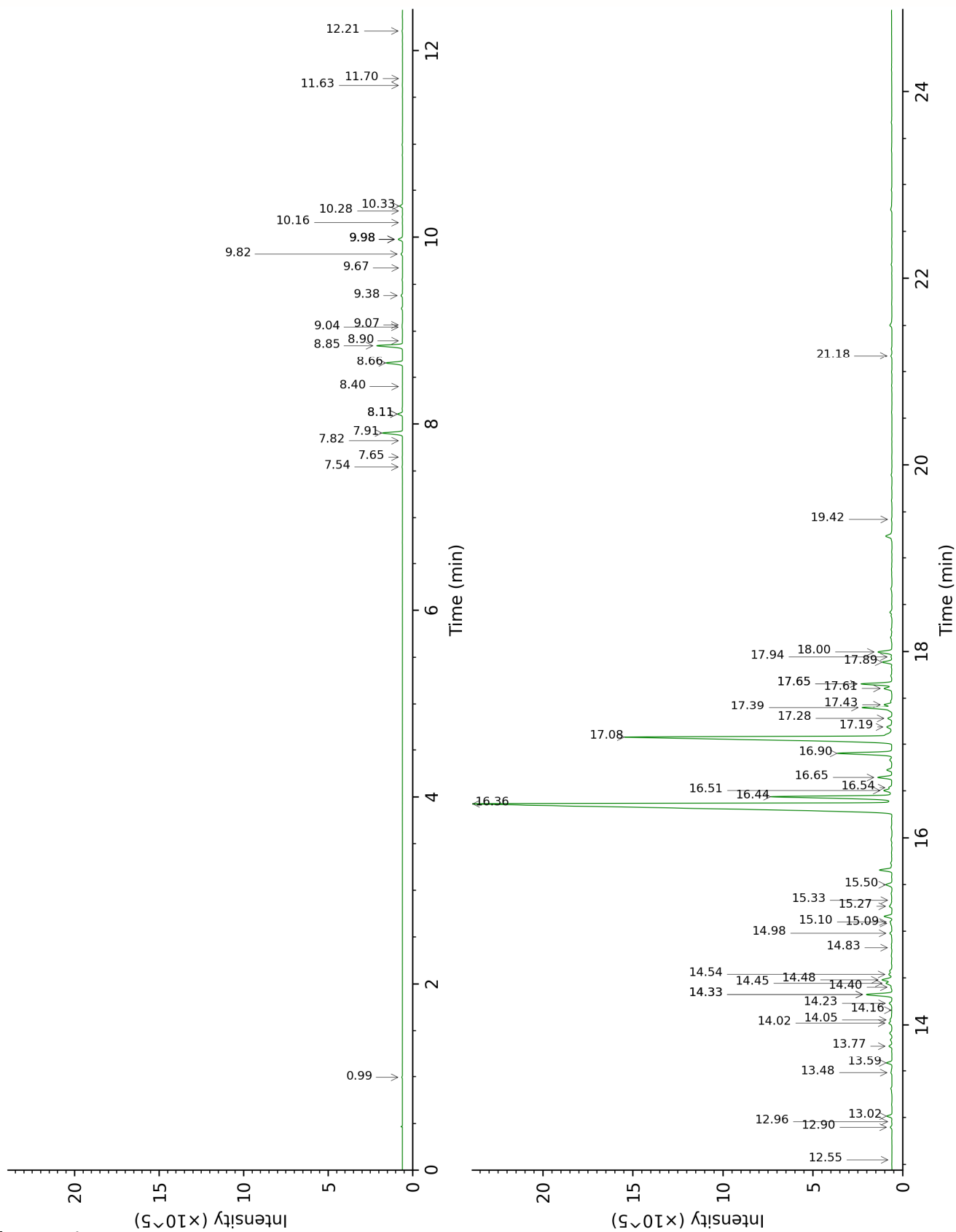
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

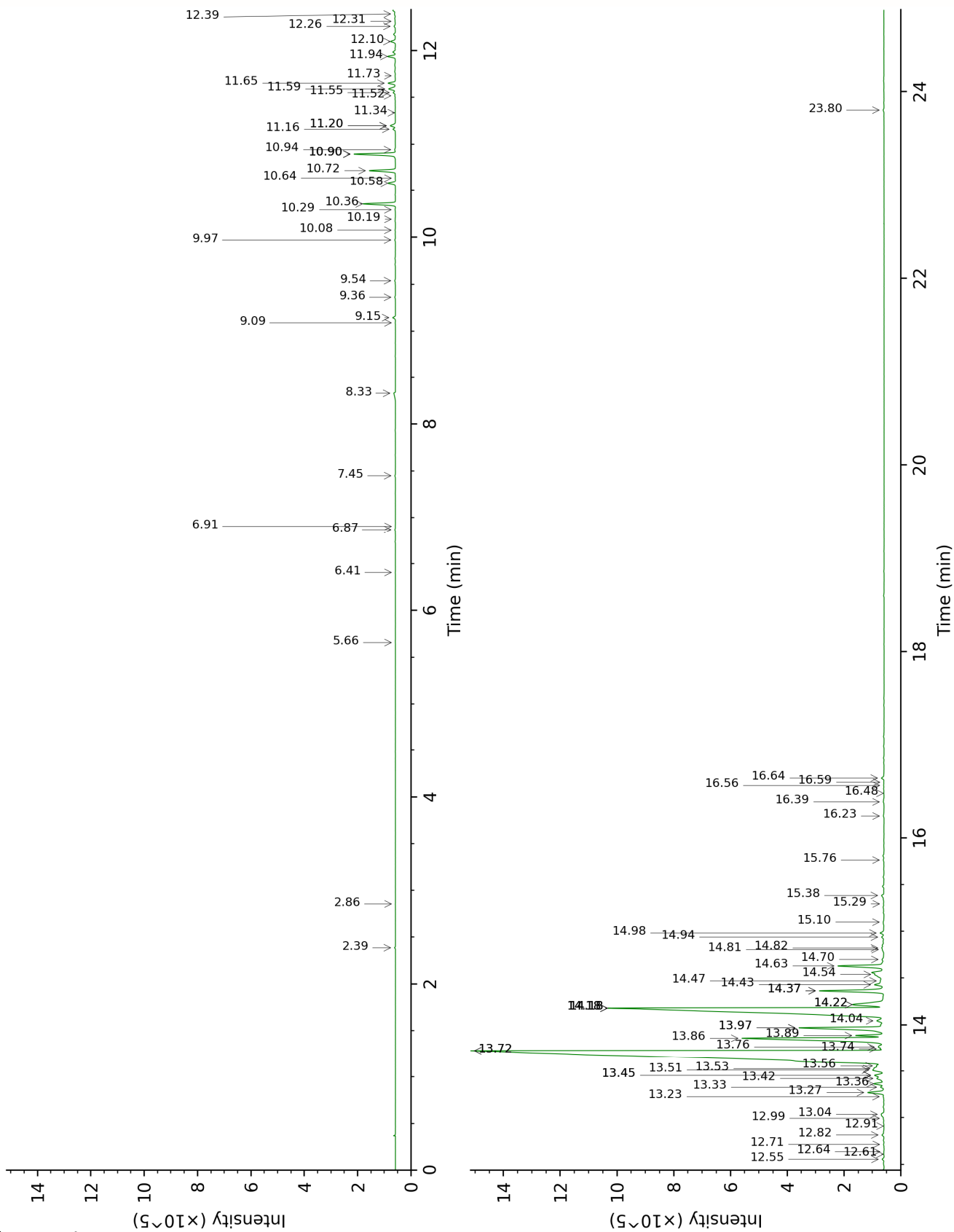
Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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

DB-WAX



DB-5



FULL ANALYSIS DATA

Santene	Column DB-WAX			Column DB-5		
	1.00	946.3	0.02	2.39	882.5	0.03
Tricyclene				2.86	918.3	tr
Linalool	7.82	1519.0	0.01	5.66	1100.9	0.01
Sabinaketone	8.40	1564.1	0.01	6.41	1149.5	0.01
4-Methylacetophenone	10.16	1705.9	0.01	6.87	1179.7	0.02
Teresantalol?				6.91	1182.0	0.01
Unknown SASP II [m/z 93, 91 (89), 94 (85), 105 (60)... 176? (10)]	8.90	1603.0	0.02	7.45	1217.9	0.02
Teresantalic acid	15.27	2179.2	0.18	8.33	1278.3	0.13
Unknown SASP III [m/z 121, 93 (77), 79 (43), 91 (43), 145 (35)... 178 (8)]				9.09	1327.3	0.01
Tricycloekasantalal	9.98*	1691.1	[0.25]	9.15	1331.2	0.09
(1S,5S,6R)-2,6-Dimethylbicyclo[3.1.1]hept-2-ene-6-propanal?	9.98*	1691.1	[0.25]	9.36	1346.7	0.02
Unknown SAAL II [m/z 93, 160 (81), 91 (58), 94 (53), 134 (53)...]				9.54	1359.3	0.03
7-epi-Sesquithujene	7.54	1497.3	0.02	9.97	1390.1	0.02
γ-4-Dimethylbenzenebutyral				10.08	1397.5	0.01
α-Cedrene	7.65	1505.4	0.01	10.19	1405.9	0.01
β-Cedrene	8.11*	1541.3	[0.24]	10.30	1413.5	0.02
α-Santalene	7.91	1525.5	1.07	10.36	1418.2	1.06
trans-α-Bergamotene	8.11*	1541.3	[0.24]	10.58	1434.7	0.25
Unknown SASP IV [m/z 93, 91 (80), 79 (68), 123 (68), 121 (56)... 204 (3)]				10.64	1439.2	0.01
epi-β-Santalene	8.66	1583.9	0.87	10.72	1445.3	0.88
α-Acoradiene	9.04	1614.8	0.02	10.90*	1458.6	[1.43]
β-Santalene	8.85	1598.8	1.42	10.90*	1458.6	[1.43]
β-Acoradiene	9.07	1616.8	0.02	10.90*	1458.6	[1.43]
Unknown SAAL III [m/z 135, 119 (34), 107 (25), 91 (20), 93 (19)...]				10.94	1462.2	0.03
γ-Curcumene	9.38	1642.3	0.08	11.16	1478.6	0.09
Unknown SASP V [m/z 119, 91 (24), 105 (16), 121 (16), 93 (15), 117 (15), 41 (14), 132 (14)... 204 (4)]				11.20*	1481.3	[0.20]
ar-Curcumene	10.33	1721.0	0.15	11.20*	1481.3	[0.20]

Unknown SASP VI [m/z 119, 105 (51), 91 (31), 132 (30), 121 (26), 145 (23), 134 (20)... 204 (2)]	11.70	1839.6	0.01	11.34	1491.7	0.01
α -Alaskene	9.67	1666.2	0.01	11.52	1505.4	0.02
β -Bisabolene	9.82	1678.3	0.08	11.55	1508.0	0.08
β -Curcumene	9.98*	1691.1	[0.25]	11.59	1511.1	0.29
Unknown CULO LIV [m/z 121, 93 (56), 91 (12), 94 (11), 122 (10)...220]	13.02	1959.4	0.25	11.65	1516.0	0.25
β -Sesquiphellandrene	10.28	1716.6	0.01	11.73	1522.3	0.02
Unknown SAAL VIII [m/z 121, 93 (91), 79 (57), 91 (25), 43 (23), 77 (18)...202 (8)]	13.59	2013.1	0.27	11.94	1538.6	0.27
Unknown SAAL IX [m/z 121, 93 (79), 79 (51), 91 (21), 77 (16), 43 (15)...202 (5)]				12.10	1551.2	0.18
(E)-Nerolidol	13.48	2002.9	0.07	12.26	1564.1	0.05
Unknown SASP VIII [m/z 43, 125 (78), 107 (43), 132 (34), 67 (31)... 220 (3)]	11.63	1833.1	0.03	12.32	1568.3	0.01
Dendrolasin	12.21	1885.0	0.04	12.40	1574.6	0.05
Humulene epoxide I	12.90	1948.3	0.08	12.56	1587.3	0.07
Helifolen-12-al A	12.55	1915.8	0.01	12.61	1591.6	0.02
Guaiol	13.77	2031.0	0.16	12.64	1593.7	0.01
Helifolen-12-al B	12.96	1953.9	0.02	12.71	1599.8	0.02
Unknown SASP X [m/z 81, 41 (40), 69 (36), 138 (27), 43 (26), 110 (25)... 222 (1)]				12.82	1608.0	0.09
Rosifolol	14.02	2054.9	0.20	12.91	1615.9	0.01
α -Acorenol	14.16	2068.3	0.02	12.99	1622.7	0.03
β -Acorenol	14.54	2105.7	0.19	13.04	1626.3	0.18
β -Eudesmol	15.09	2160.7	0.06	13.23	1642.1	0.05
Unknown SASP XI [m/z 91, 43 (89), 93 (84), 81 (81), 105 (79), 79 (70), 67 (68), 41 (68)...]				13.27	1645.7	0.62
α -Bisabolol oxide B, epimer 1	14.06	2058.3	0.14	13.33	1650.5	0.12
α -Bisabolol oxide B, epimer 2	14.23	2075.4	0.18	13.36	1653.6	0.36
Unknown SAAL IV [m/z 93, 121 (97), 91 (30), 92 (27), 79 (26), 94 (21), 105 (19), 122 (18)... 222 (9)]	15.50	2202.6	0.36	13.42	1658.3	0.37

Unknown SAAL VI [m/z 67, 119 (70), 82 (42), 91 (37), 95 (36), 121 (34), 93 (32)...	14.40	2092.1	0.05	13.45*	1661.1	[0.41]
Bulnesol	14.98	2150.1	0.12	13.45*	1661.1	[0.41]
epi-β-Bisabolol	14.48	2099.8	0.60	13.51	1665.8	0.54
β-Bisabolol	14.45	2096.3	0.36	13.53	1667.1	0.31
epi-Cyclosantalal	14.33*	2084.6	[1.47]	13.56	1669.5	0.24
(Z)-α-Santalol	16.36	2292.9	46.52	13.72*	1683.4	[47.59]
(E)-α-Santalol	14.33*	2084.6	[1.47]	13.72*	1683.4	[47.59]
α-Bisabolol	15.10	2162.3	0.10	13.74	1685.2	0.08
Unknown FRAG MCDXXXIII [m/z 95, 94 (90), 93 (58), 123 (53), 121 (49)...				13.76	1686.8	0.28
(Z)-α-trans-Bergamotol	16.44	2301.0	6.70	13.86	1694.6	6.67
(E)-α-Santalol	16.65	2323.3	0.73	13.89	1697.1	0.78
(Z)-epi-β-Santalol	16.90	2351.2	2.97	13.97*	1703.9	[3.48]
(E)-α-trans-Bergamotol	17.43	2408.8	0.39	13.97*	1703.9	[3.48]
(Z)-α-Santalyl formate?				14.04	1710.3	0.37
(Z)-β-Santalol	17.08	2370.0	20.87	14.18*†	1722.1	[21.38]
(2E,6E)-Farnesol	16.51	2308.2	0.50	14.18*†	1722.1	[21.38]
Unknown ZIOF XXXIX [m/z 119, 91 (31), 105 (29), 41 (25), 133 (23), 158 (21)...	16.54	2311.5	0.17	14.18*†	1722.1	[21.38]
Unknown SASP XIV [m/z 43, 189 (94), 81 (65), 93 (62), 95 (53), 119 (49)... 207 (43)...	15.33	2185.8	0.02	14.18*†	1722.1	[21.38]
(Z)-γ-Curcumen-12-ol	17.19	2381.7	0.34	14.22*†	1725.4	[1.82]
(Z)-Nuciferol	17.89	2460.1	0.50	14.22*†	1725.4	[1.82]
Unknown SAAL X [m/z 91, 93 (65), 79 (57), 105 (49), 119 (47), 121 (44)...218 (1)]	18.00	2472.4	0.84	14.37*	1738.3	[2.31]
(E)-β-Santalol	17.39	2404.5	1.74	14.37*	1738.3	[2.31]
Unknown SAAL XIX [m/z 93, 110 (80), 119 (74), 107 (74), 79 (64)... 236 (9)]				14.43	1743.9	0.48
Curcumen-12-ol analog	17.28	2391.7	0.22	14.47	1747.5	0.14
(Z)-β-Curcumen-12-ol	17.61	2428.4	0.46	14.54	1753.5	0.55
(Z)-Lanceol	17.65*	2433.9	[1.58]	14.63	1761.5	1.78
Unknown SASP XV [m/z 93, 107 (80), 43 (74), 91 (55), 41 (49), 79 (48), 119 (48)... 236 (3)]				14.70	1767.5	0.12
(Z)-α-Santalyl acetate	14.83	2134.6	0.03	14.81	1776.7	0.07
Unknown SASP XVI [m/z 93, 119 (89), 91 (63), 79 (63),	17.65*	2433.9	[1.58]	14.82	1778.2	0.09

132 (53), 41 (52)... 236 (3)]						
Unknown SASP XVII [m/z 107, 93 (96), 79 (90), 55 (78), 41 (76)... 236 (6)]				14.94	1788.3	0.10
Bisabola-2,7(Z),10(Z)-trien-13-ol?	17.94	2466.4	0.05	14.98	1792.1	0.16
Unknown SASP XIX [m/z 119, 105 (78), 145 (60), 91 (50), 121 (44), 93 (38)... 216 (7)]	19.42	2639.3	0.04	15.10	1802.2	0.07
Unknown SASP XX [m/z 119, 145 (62), 105 (52), 91 (52), 121 (38)...]				15.30	1819.8	0.02
Unknown SASP XXII [m/z 119, 43 (61), 132 (49), 105 (35), 141 (32)...]				15.38	1828.0	0.13
Unknown UNKN CLXII [m/z 93, 91 (51), 121 (45), 94 (39), 79 (36), 107 (34)...]				15.76	1862.6	0.04
Unknown SAAU IV [m/z 43, 94 (97), 109 (86), 67 (47), 95 (44), 122 (42)...]				16.23	1905.6	0.04
Unknown SAAU III [m/z 93, 43 (99), 109 (95), 68 (80), 95 (77), 81 (69), 110 (68)...220 (7)]	21.18	2857.9	0.08	16.38	1919.9	0.05
Unknown SAAU V [m/z 95, 109 (98), 43 (83), 93 (60), 41 (54), 67 (48), 81 (48)...220 (4)]				16.48	1928.7	0.01
Unknown CIAU XI [m/z 218, 176 (91), 146 (37), 161 (30), 133 (27), 147 (20)...]				16.56	1936.7	0.02
Unknown SAAU VI [m/z 43, 107 (24), 93 (23), 125 (23), 95 (23), 119 (23)...220 (1)]				16.60	1940.0	0.01
Unknown SAAU VIII [m/z 93, 94 (86), 91 (48), 121 (42), 79 (42), 107 (37)...218 (2)]				16.64	1944.3	0.11
Unknown MISC LXV [m/z 93, 121 (96), 94 (81), 91 (46), 203 (41), 122 (40)...]				23.80	2735.5	0.04
Total reported		94.02%			97.87%	

*: 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