

Date : 2026-03-25

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 26B17-PTH04

Customer Identification : Sandalwood Indian - India - SA2110

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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. The compliance status of the sample is provided to facilitate the reading of the report. The client remains ultimately responsible for reviewing the results presented within this report and to establish compliance of the tested batch against relevant quality criteria.

This report is an update of the version first issued on 2026-02-19 to make a correction in the sample identification section.

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 : Jean-Christophe Fortin, M. Sc.

Date : 2026-02-19

PHYSICOCHEMICAL DATA

Refractive index : 1.5065 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2026-02-18

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	0.01	Normonoterpene
Tricyclene	tr	Monoterpene
4-Methylacetophenone	0.01	Simple phenolic
Unknown	0.03	Terpene derivative
Teresantalic acid	0.06	Monoterpenic acid
Unknown	0.01	Terpenic aldehyde
Tricycloekasantalal	0.11	Terpenic aldehyde
(1S,5S,6R)-2,6-Dimethylbicyclo[3.1.1]hept-2-ene-6-propanal?	0.03	Terpenic aldehyde
Unknown	0.03	Unknown
7-epi-Sesquithujene	0.02	Sesquiterpene
γ -4-Dimethylbenzenebutyral	0.04	Simple phenolic
α -Cedrene	0.02	Sesquiterpene
β -Cedrene	0.02	Sesquiterpene
α -Santalene	0.99	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.23	Sesquiterpene
Unknown	0.02	Sesquiterpene
epi- β -Santalene	0.92	Sesquiterpene
β -Santalene	1.44	Sesquiterpene
Unknown	0.01	Unknown
β -Acoradiene	0.02	Sesquiterpene
γ -Curcumene	0.06	Sesquiterpene
Unknown	0.01	Sesquiterpene
α -Curcumene	0.28	Sesquiterpene
Unknown	0.01	Sesquiterpene
α -Alaskene	0.02	Sesquiterpene
β -Bisabolene	0.11	Sesquiterpene
β -Curcumene	0.26	Sesquiterpene
Photosantalol	0.16	Sesquiterpenic alcohol
β -Sesquiphellandrene	0.01	Sesquiterpene
Unknown	0.19	Sesquiterpene
Unknown	0.12	Sesquiterpene
(<i>E</i>)-Nerolidol	0.07	Sesquiterpenic alcohol
Unknown	0.02	Oxygenated sesquiterpene
Dendrolasin	0.07	Sesquiterpenic ether
Helifolen-12-al A	0.07	Sesquiterpenic aldehyde
Helifolen-12-al B	0.03	Sesquiterpenic aldehyde
Unknown	0.09	Oxygenated sesquiterpene
Rosifoliol	0.04	Sesquiterpenic alcohol
α -Acorenol	0.04	Sesquiterpenic alcohol

β-Acorenol	0.15	Sesquiterpenic alcohol
10-epi-β-Acorenol?	0.04	Sesquiterpenic alcohol
Unknown	0.56	Oxygenated sesquiterpene
β-Eudesmol	0.07	Sesquiterpenic alcohol
α-Bisabolol oxide B, epimer 1	0.16	Sesquiterpenic alcohol
α-Bisabolol oxide B, epimer 2	0.02	Sesquiterpenic alcohol
Unknown	0.41	Oxygenated sesquiterpene
Unknown	0.24	Oxygenated sesquiterpene
Bulnesol	0.14	Sesquiterpenic alcohol
Unknown	0.09	Oxygenated sesquiterpene
epi-β-Bisabolol	0.46	Sesquiterpenic alcohol
β-Bisabolol	0.39	Sesquiterpenic alcohol
epi-Cyclosantalal	0.28	Sesquiterpenic aldehyde
(E)-α-Santalal	1.65	Sesquiterpenic aldehyde
(Z)-α-Santalol	45.10	Sesquiterpenic alcohol
α-Bisabolol	0.08	Sesquiterpenic alcohol
Unknown FRAG MCDXXXIII [m/z 95, 94 (90), 93 (58), 123 (53), 121 (49)...]	0.32	Unknown
(Z)-α-trans-Bergamotol	6.76	Sesquiterpenic alcohol
(E)-α-Santalol	0.52	Sesquiterpenic alcohol
(Z)-epi-β-Santalol	3.07	Sesquiterpenic alcohol
Unknown	0.50	Oxygenated sesquiterpene
(E)-α-trans-Bergamotol	0.39	Sesquiterpenic alcohol
(Z)-β-Santalol	20.49	Sesquiterpenic alcohol
Unknown	0.21	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
(2E,6E)-Farnesol	0.45	Sesquiterpenic alcohol
(Z)-Nuciferol	1.45	Sesquiterpenic alcohol
(Z)-γ-Curcumen-12-ol	1.01	Sesquiterpenic alcohol
(2E,6E)-Farnesal	0.01	Sesquiterpenic aldehyde
(E)-β-Santalol	1.45	Sesquiterpenic alcohol
Unknown	1.00	Oxygenated sesquiterpene
Unknown	0.30	Oxygenated sesquiterpene
Curcumen-12-ol analog	0.24	Sesquiterpenic alcohol
Santalol isomer II	0.28	Sesquiterpenic alcohol
Unknown SAAL XX [m/z 91, 93 (57), 119 (56), 79 (54), 105 (53)...]	0.29	Unknown
(Z)-β-Curcumen-12-ol	0.53	Sesquiterpenic alcohol
(Z)-Lanceol	2.33	Sesquiterpenic alcohol
Unknown	0.10	Oxygenated sesquiterpene
(Z)-α-Santalyl acetate	0.06	Sesquiterpenic ester
Unknown	0.13	Oxygenated sesquiterpene
Unknown	0.09	Oxygenated sesquiterpene
Bisabola-2,7(Z),10(Z)-trien-13-ol?	0.16	Oxygenated sesquiterpene
Unknown	0.03	Oxygenated sesquiterpene

Unknown	0.12	Oxygenated sesquiterpene
Unknown	0.03	Unknown
Unknown	0.04	Unknown
Unknown	0.05	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.07	Oxygenated sesquiterpene
Palmitic acid	0.05	Aliphatic acid
Unknown	0.04	Unknown
Consolidated total	98.17	

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

Note: no correction factor was applied

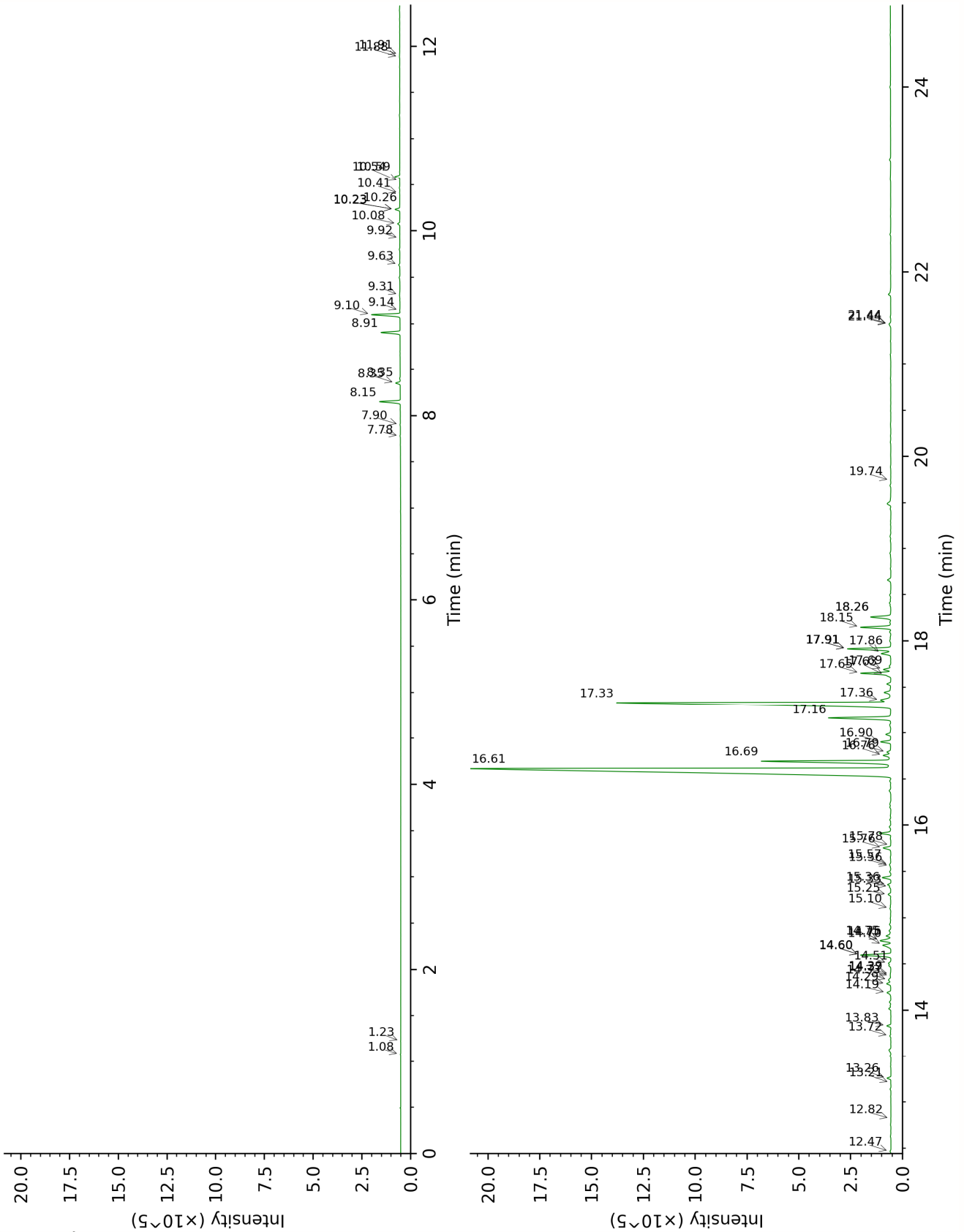
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

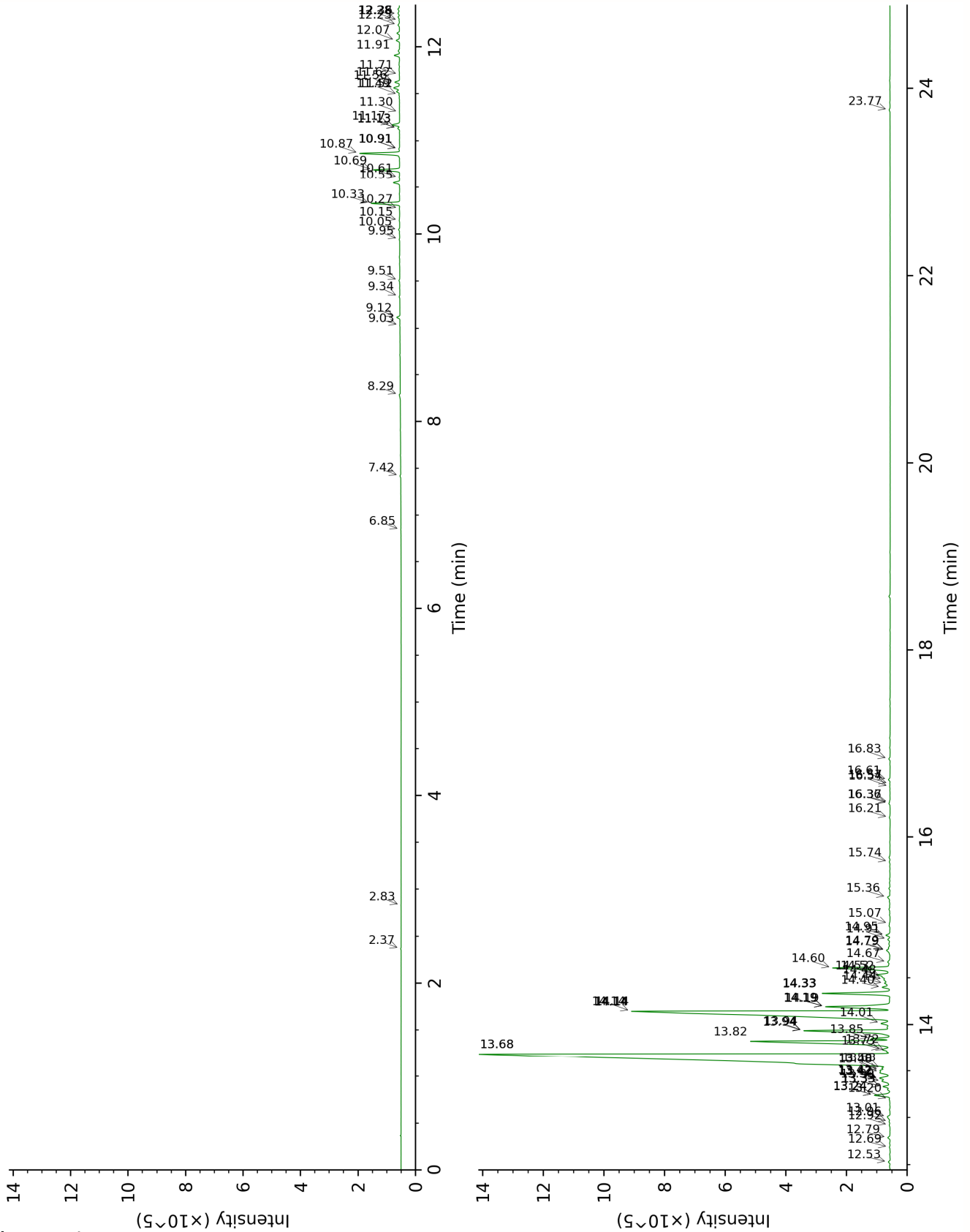
Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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		
	1.08	948.3	0.01	2.37	883.3	0.01
Tricyclene	1.22	971.4	tr	2.83	918.8	tr
4-Methylacetophenone	10.41	1707.8	0.01	6.85	1180.2	0.01
Unknown SASP II [m/z 93, 91 (89), 94 (85), 105 (60)... 176? (10)]	9.14	1604.3	0.01	7.42	1218.0	0.03
Teresantalic acid	15.57	2184.3	0.07	8.28	1276.9	0.06
Unknown SASP III [m/z 121, 93 (77), 79 (43), 91 (43), 145 (35)... 178 (8)]				9.03	1325.5	0.01
Tricycloekasantalal (1S,5S,6R)-2,6-Dimethylbicyclo[3.1.1]hept-2-ene-6-propanal?	10.23*	1693.2	[0.22]	9.12	1331.5	0.11
Unknown SAAL II [m/z 93, 160 (81), 91 (58), 94 (53), 134 (53)...]	10.26	1695.6	0.01	9.34	1347.1	0.03
7-epi-Sesquithujene	7.78	1498.2	0.02	9.51	1359.2	0.03
γ -4-Dimethylbenzenebutyral				9.94	1390.4	0.02
α -Cedrene				10.05	1397.6	0.04
β -Cedrene	7.90	1507.7	0.02	10.15	1404.8	0.02
α -Santalene	8.35*	1542.8	[0.20]	10.27	1414.0	0.02
<i>trans</i> - α -Bergamotene	8.15	1527.2	0.99	10.33	1418.3	0.99
Unknown SASP IV [m/z 93, 91 (80), 79 (68), 123 (68), 121 (56)... 204 (3)]	8.35*	1542.8	[0.20]	10.55	1434.9	0.23
epi- β -Santalene				10.61	1439.3	0.02
β -Santalene	8.91	1585.9	0.90	10.69	1445.5	0.92
Unknown SAAL III [m/z 135, 119 (34), 107 (25), 91 (20), 93 (19)...]	9.10	1600.9	1.41	10.87	1458.7	1.44
β -Acoradiene				10.91*	1462.2	[0.03]
γ -Curcumene	9.31	1617.9	0.02	10.91*	1462.2	[0.03]
Unknown SASP V [m/z 119, 91 (24), 105 (16), 121 (16), 93 (15), 117 (15), 41 (14), 132 (14)... 204 (4)]	9.63	1644.5	0.06	11.13*	1478.7	[0.06]
ar-Curcumene				11.13*	1478.7	[0.06]
Unknown SASP VI [m/z 119, 105 (51), 91 (31), 132 (30), 121 (26), 145 (23), 134 (20)... 204 (2)]	10.59	1723.2	0.24	11.17	1481.5	0.28
	11.91	1837.4	0.02	11.30	1491.6	0.01

α -Alaskene	9.92	1667.8	tr	11.49	1505.6	0.02
β -Bisabolene	10.08	1680.6	0.10	11.52	1508.3	0.11
β -Curcumene	10.23*	1693.2	[0.22]	11.56	1511.4	0.26
Photosantalol	13.26	1959.5	0.18	11.62	1516.2	0.16
β -Sesquiphellandrene	10.54	1718.8	0.01	11.71	1522.6	0.01
Unknown SAAL VIII [m/z 121, 93 (91), 79 (57), 91 (25), 43 (23), 77 (18)...202 (8)]	13.83	2013.1	0.18	11.91	1538.8	0.19
Unknown SAAL IX [m/z 121, 93 (79), 79 (51), 91 (21), 77 (16), 43 (15)...202 (5)]				12.07	1551.4	0.12
(E)-Nerolidol	13.72	2002.6	0.05	12.23	1564.3	0.07
Unknown SASP VIII [m/z 43, 125 (78), 107 (43), 132 (34), 67 (31)... 220 (3)]	11.88	1835.0	0.02	12.28	1568.1	0.02
Dendrolasin	12.47	1886.7	0.04	12.36	1574.2	0.07
Helifolen-12-al A	12.82	1918.9	0.01	12.53	1587.5	0.07
Helifolen-12-al B	13.21	1954.8	0.01	12.69	1600.0	0.03
Unknown SASP X [m/z 81, 41 (40), 69 (36), 138 (27), 43 (26), 110 (25)... 222 (1)]				12.79	1608.2	0.09
Rosifoliol	14.29	2057.1	0.24	12.92	1619.2	0.04
α -Acorenol	14.37	2065.2	0.04	12.96	1622.3	0.04
β -Acorenol	14.75*	2102.0	[0.65]	13.01	1626.7	0.15
10-epi- β -Acorenol?				13.20	1642.1	0.04
Unknown SASP XI [m/z 91, 43 (89), 93 (84), 81 (81), 105 (79), 79 (70), 67 (68), 41 (68)...]				13.24*	1645.8	[0.63]
β -Eudesmol	15.33	2160.3	0.07	13.24*	1645.8	[0.63]
α -Bisabolol oxide B, epimer 1	14.33	2060.9	0.16	13.33*	1653.4	[0.26]
α -Bisabolol oxide B, epimer 2	14.39	2067.1	0.02	13.33*	1653.4	[0.26]
Unknown SAAL IV [m/z 93, 121 (97), 91 (30), 92 (27), 79 (26), 94 (21), 105 (19), 122 (18)... 222 (9)]	15.76	2202.8	0.42	13.39	1658.4	0.41
Unknown SAAL V [m/z 121, 93 (96), 95 (96), 41 (65), 82 (63), 69 (62), 67 (59)... 222 (8)]	14.19	2047.7	0.24	13.42*	1661.0	[0.47]
Bulnesol	15.25	2152.2	0.14	13.42*	1661.0	[0.47]
Unknown SAAL VI [m/z 67, 119 (70), 82 (42), 91 (37), 95	14.60*	2086.9	[1.54]	13.42*	1661.0	[0.47]

(36), 121 (34), 93 (32)...						
epi-β-Bisabolol	14.70	2097.2	0.53	13.48	1665.7	0.46
β-Bisabolol	14.75*	2102.0	[0.65]	13.50	1667.6	0.39
epi-Cyclosantalal	14.51	2078.3	0.13	13.53	1669.8	0.28
(E)-α-Santalal	14.60*	2086.9	[1.54]	13.68*	1682.6	[46.75]
(Z)-α-Santalol	16.61	2292.1	45.10	13.68*	1682.6	[46.75]
α-Bisabolol	15.36	2162.9	0.15	13.72	1685.4	0.08
Unknown FRAG MCDXXXIII [m/z 95, 94 (90), 93 (58), 123 (53), 121 (49)...]				13.73	1686.6	0.32
(Z)-α-trans-Bergamotol	16.69	2300.5	6.70	13.82	1694.1	6.76
(E)-α-Santalol	16.90	2323.2	0.49	13.85	1696.5	0.52
(Z)-epi-β-Santalol	17.16	2351.1	3.07	13.94*	1703.5	[3.57]
Unknown SASP XII [m/z 43, 93 (68), 41 (61), 69 (58), 125 (54), 107 (50)...]				13.94*	1703.5	[3.57]
(E)-α-trans-Bergamotol	17.69	2408.6	0.36	14.01	1710.1	0.39
(Z)-β-Santalol	17.33†	2369.2	19.97	14.14*	1721.4	[20.73]
Unknown ZIOF XXXIX [m/z 119, 91 (31), 105 (29), 41 (25), 133 (23), 158 (21)...]	16.79	2311.1	0.21	14.14*	1721.4	[20.73]
Unknown SASP XIV [m/z 43, 189 (94), 81 (65), 93 (62), 95 (53), 119 (49)... 207 (43)...]	15.56	2182.9	0.02	14.14*	1721.4	[20.73]
(2E,6E)-Farnesol	16.76	2307.3	0.45	14.19*	1725.7	[2.92]
(Z)-Nuciferol	18.15	2459.8	1.45	14.19*	1725.7	[2.92]
(Z)-γ-Curcumen-12-ol	17.36†	2372.4	0.67	14.19*	1725.7	[2.92]
(2E,6E)-Farnesal	15.78	2205.6	0.01	14.33*	1738.1	[2.46]
(E)-β-Santalol	17.65	2404.2	1.45	14.33*	1738.1	[2.46]
Unknown SAAL X [m/z 91, 93 (65), 79 (57), 105 (49), 119 (47), 121 (44)...218 (1)]	18.26*	2472.2	[1.08]	14.33*	1738.1	[2.46]
Unknown SAAL XIX [m/z 93, 110 (80), 119 (74), 107 (74), 79 (64)... 236 (9)]				14.40	1743.7	0.30
Curcumen-12-ol analog	17.63	2401.9	0.17	14.44	1747.6	0.24
Santalol isomer II				14.48	1750.8	0.28
Unknown SAAL XX [m/z 91, 93 (57), 119 (56), 79 (54), 105 (53)...]				14.52	1753.9	0.29
(Z)-β-Curcumen-12-ol	17.86	2427.8	0.53	14.53	1755.3	0.53
(Z)-Lanceol	17.92*	2433.6	[2.09]	14.60	1761.6	2.33
Unknown SASP XV [m/z 93, 107 (80), 43 (74), 91 (55), 41 (49), 79 (48), 119 (48)... 236				14.67	1767.2	0.10

(3)]						
(Z)- α -Santalyl acetate	15.10	2136.9	0.06	14.79*	1778.0	[0.19]
Unknown SASP XVI [m/z 93, 119 (89), 91 (63), 79 (63), 132 (53), 41 (52)... 236 (3)]	17.92*	2433.6	[2.09]	14.79*	1778.0	[0.19]
Unknown SASP XVII [m/z 107, 93 (96), 79 (90), 55 (78), 41 (76)... 236 (6)]				14.91	1788.1	0.09
Bisabola-2,7(Z),10(Z)-trien-13-ol?	18.26*	2472.2	[1.08]	14.95	1792.1	0.16
Unknown SASP XIX [m/z 119, 105 (78), 145 (60), 91 (50), 121 (44), 93 (38)... 216 (7)]	19.74	2644.6	0.02	15.08	1802.6	0.03
Unknown SASP XXII [m/z 119, 43 (61), 132 (49), 105 (35), 141 (32)...]				15.36	1828.3	0.12
Unknown UNKN CLXII [m/z 93, 91 (51), 121 (45), 94 (39), 79 (36), 107 (34)...]				15.74	1862.7	0.03
Unknown SAAU IV [m/z 43, 94 (97), 109 (86), 67 (47), 95 (44), 122 (42)...]				16.21	1905.8	0.04
Unknown SAAU III [m/z 93, 43 (99), 109 (95), 68 (80), 95 (77), 81 (69), 110 (68)...220 (7)]	21.44*	2854.1	[0.12]	16.36	1920.1	0.05
Unknown SAAU II [m/z 93, 109 (98), 43 (97), 68 (83), 95 (74), 110 (72), 81 (71)...220 (8)]	21.44*	2854.1	[0.12]	16.37	1921.5	0.02
Unknown CIAU XI [m/z 218, 176 (91), 146 (37), 161 (30), 133 (27), 147 (20)...]				16.54	1937.0	0.02
Unknown SAAU VI [m/z 43, 107 (24), 93 (23), 125 (23), 95 (23), 119 (23)...220 (1)]				16.57	1940.0	0.01
Unknown SAAU VIII [m/z 93, 94 (86), 91 (48), 121 (42), 79 (42), 107 (37)...218 (2)]				16.61	1944.2	0.07
Palmitic acid				16.83	1965.3	0.05
Unknown MISC LXV [m/z 93, 121 (96), 94 (81), 91 (46), 203 (41), 122 (40)...]				23.77	2734.9	0.04
Total reported		93.19%			98.24%	

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*: 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