

Date : 2024-10-28

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24J11-PTH03

Customer Identification : Himalayan Cedarwood - India - C50111R

Type : Essential Oil

Source : *Cedrus deodara*

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 : 2024-10-22

PHYSICOCHEMICAL DATA

Refractive index : 1.5149 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2024-10-15

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
1-Methylcyclohexene	tr	Alkene
Mesityl oxide	0.02	Aliphatic ketone
α -Pinene	0.06	Monoterpene
Camphene	0.01	Monoterpene
β -Pinene	0.03	Monoterpene
3-Methyl-3-cyclohexenone	0.01	Aliphatic ketone
Limonene	0.02	Monoterpene
Terpinolene	0.01	Monoterpene
<i>para</i> -Cymenene	0.01	Monoterpene
Unknown	0.02	Oxygenated monoterpene
Limona ketone	0.59	Normonoterpenic ketone
α ,4-Dimethyl-3-cyclohexene-1-methanol	0.04	Normonoterpenic alcohol
α ,4-Dimethyl-3-cyclohexene-1-methanol epimer	0.04	Normonoterpenic alcohol
Borneol	0.01	Monoterpenic alcohol
Terpinen-4-ol	tr	Monoterpenic alcohol
4-Methylacetophenone	0.08	Simple phenolic
α -Terpineol	0.03	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
α -Longipinene	0.09	Sesquiterpene
Longicyclene	0.01	Sesquiterpene
α -Ylangene	0.06	Sesquiterpene
α -Copaene	0.02	Sesquiterpene
Unknown	0.01	Terpene derivative
Unknown	0.04	Sesquiterpene
Unknown	0.04	Unknown
(3Z)-Hexenyl (3Z)-hexenoate	0.09	Aliphatic ester
Unknown	0.12	Sesquiterpene
Sativene	0.04	Sesquiterpene
β -Elemene	0.01	Sesquiterpene
β -Longipinene	0.04	Sesquiterpene
Longifolene	0.50	Sesquiterpene
Sibirene	0.11	Sesquiterpene
Unknown	0.01	Unknown
α -Cedrene	0.03	Sesquiterpene
(Z?)-Vestitenone, or analog	0.07	Terpenic ketone
Unknown	0.04	Unknown
Himachala-2,4-diene	0.48	Sesquiterpene
Unknown	0.02	Sesquiterpene
Unknown	0.18	Sesquiterpene

<i>trans</i> - α -Bergamotene	0.10	Sesquiterpene
Himachala-2,4-diene isomer	0.20	Sesquiterpene
α -Himachalene	13.82	Sesquiterpene
(<i>E</i>)-Vestitenone	0.49	Terpenic ketone
α -Humulene	0.04	Sesquiterpene
Unknown	0.19	Sesquiterpene
(<i>E</i>)- β -Farnesene	0.24	Sesquiterpene
Unknown	0.38	Sesquiterpene
Unknown	0.44	Sesquiterpene
γ -Himachalene	8.91	Sesquiterpene
11- α H-Himachala-1,4-diene	1.64	Sesquiterpene
Unknown	0.18	Sesquiterpenic ether
(<i>Z</i>)- α -Bisabolene	0.04	Sesquiterpene
β -Himachalene	36.21	Sesquiterpene
Cycloisolongifol-5-ol	0.11	Sesquiterpenic alcohol
Unknown	0.15	Sesquiterpene
γ -Cadinene	0.02	Sesquiterpene
α -Dehydro-ar-himachalene	0.34	Sesquiterpene
γ -Dehydro-ar-himachalene	0.28	Sesquiterpene
<i>trans</i> -Calamenene	0.03	Sesquiterpene
Unknown	0.32	Sesquiterpene
δ -Cadinene	tr	Sesquiterpene
Unknown	0.04	Sesquiterpene
ar-Himachalene	0.28	Sesquiterpene
α -Calacorene	0.16	Sesquiterpene
(<i>E</i>)- α -Bisabolene	1.12	Sesquiterpene
Unknown	0.16	Unknown
Unknown	0.21	Oxygenated sesquiterpene
(<i>E</i>)-Nerolidol	0.12	Sesquiterpenic alcohol
Unknown	0.36	Unknown
Himachalene epoxide	0.03	Sesquiterpenic ether
Unknown	0.07	Oxygenated sesquiterpene
Longiborneol	0.44	Sesquiterpenic alcohol
ar-Dihydroturmerone	0.05	Sesquiterpenic ketone
Unknown	0.03	Oxygenated sesquiterpene
Unknown	0.06	Unknown
β -Himachalene oxide	1.20	Sesquiterpenic ether
Unknown	0.43	Oxygenated sesquiterpene
α -Corocalene	0.03	Sesquiterpene
Unknown	0.11	Oxygenated sesquiterpene
Unknown	0.12	Unknown
6-Methyl-6- <i>meta</i> -tolyl-heptan-2-one	0.09	Miscellaneous
Unknown	0.29	Oxygenated sesquiterpene
Himachalol	1.43	Sesquiterpenic alcohol
Unknown	0.17	Oxygenated sesquiterpene

Allohimachalol	1.09	Sesquiterpenic alcohol
β -Atlantone	0.59	Sesquiterpenic ketone
(E)-10,11-Dihydroatlantone	0.72	Sesquiterpenic ketone
(Z)- γ -Atlantone	2.97	Sesquiterpenic ketone
Deodarone epimer I	0.19	Sesquiterpenic ketone
Deodarone epimer II	0.23	Sesquiterpenic ketone
(E)- γ -Atlantone	2.78	Sesquiterpenic ketone
(Z)- α -Atlantone	2.12	Sesquiterpenic ketone
Unknown	0.20	Oxygenated sesquiterpene
Unknown	0.12	Oxygenated sesquiterpene
Unknown	0.10	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.17	Oxygenated sesquiterpene
Unknown	0.03	Oxygenated sesquiterpene
(E)- α -Atlantone	11.56	Sesquiterpenic ketone
Unknown	0.07	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
Unknown	0.15	Oxygenated sesquiterpene
ar-Himachalen-2-ol?	0.01	Sesquiterpenic alcohol
Unknown	0.13	Oxygenated sesquiterpene
Unknown	0.17	Oxygenated sesquiterpene
Unknown	0.08	Oxygenated sesquiterpene
Consolidated total	97.68	

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

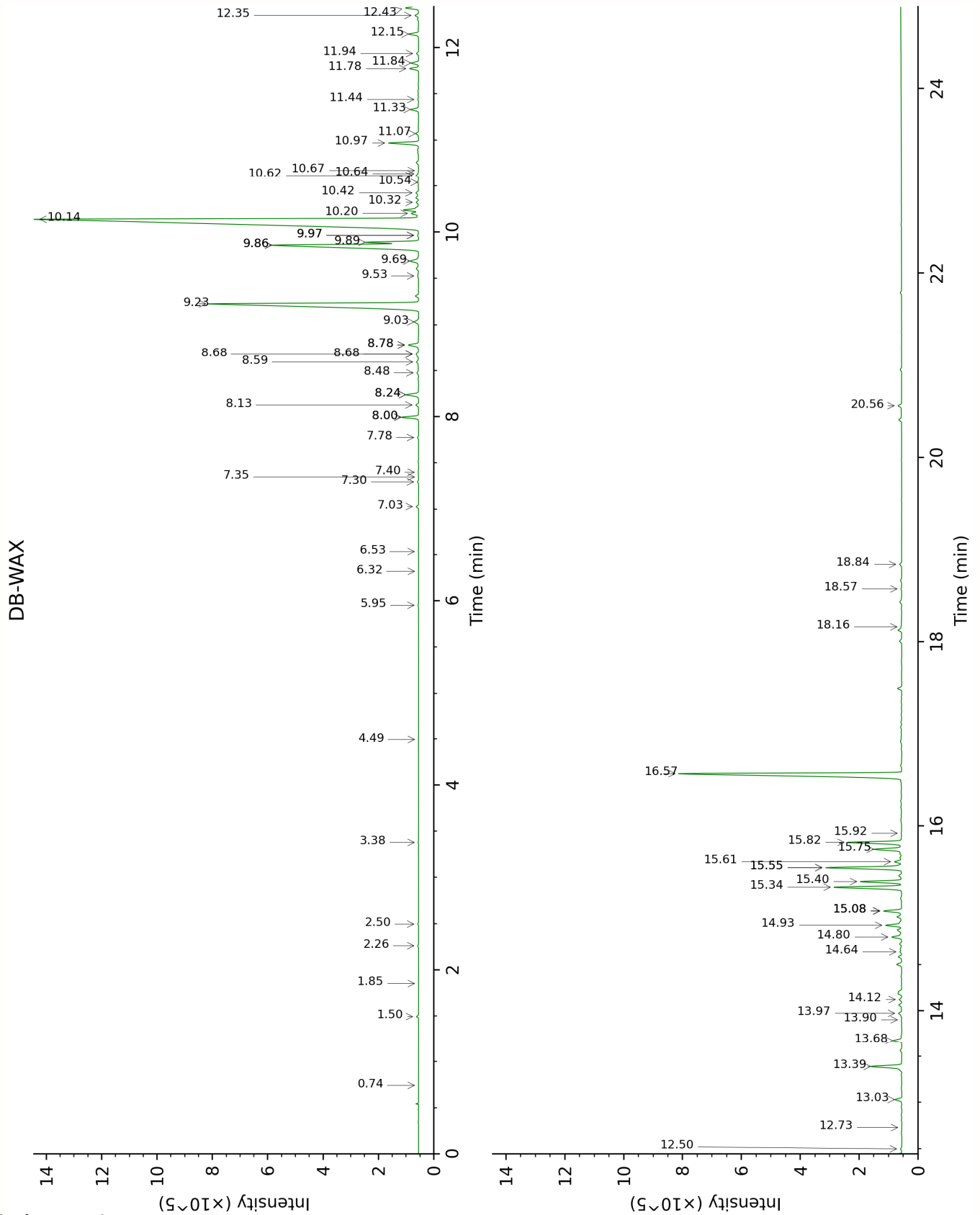
Note: no correction factor was applied

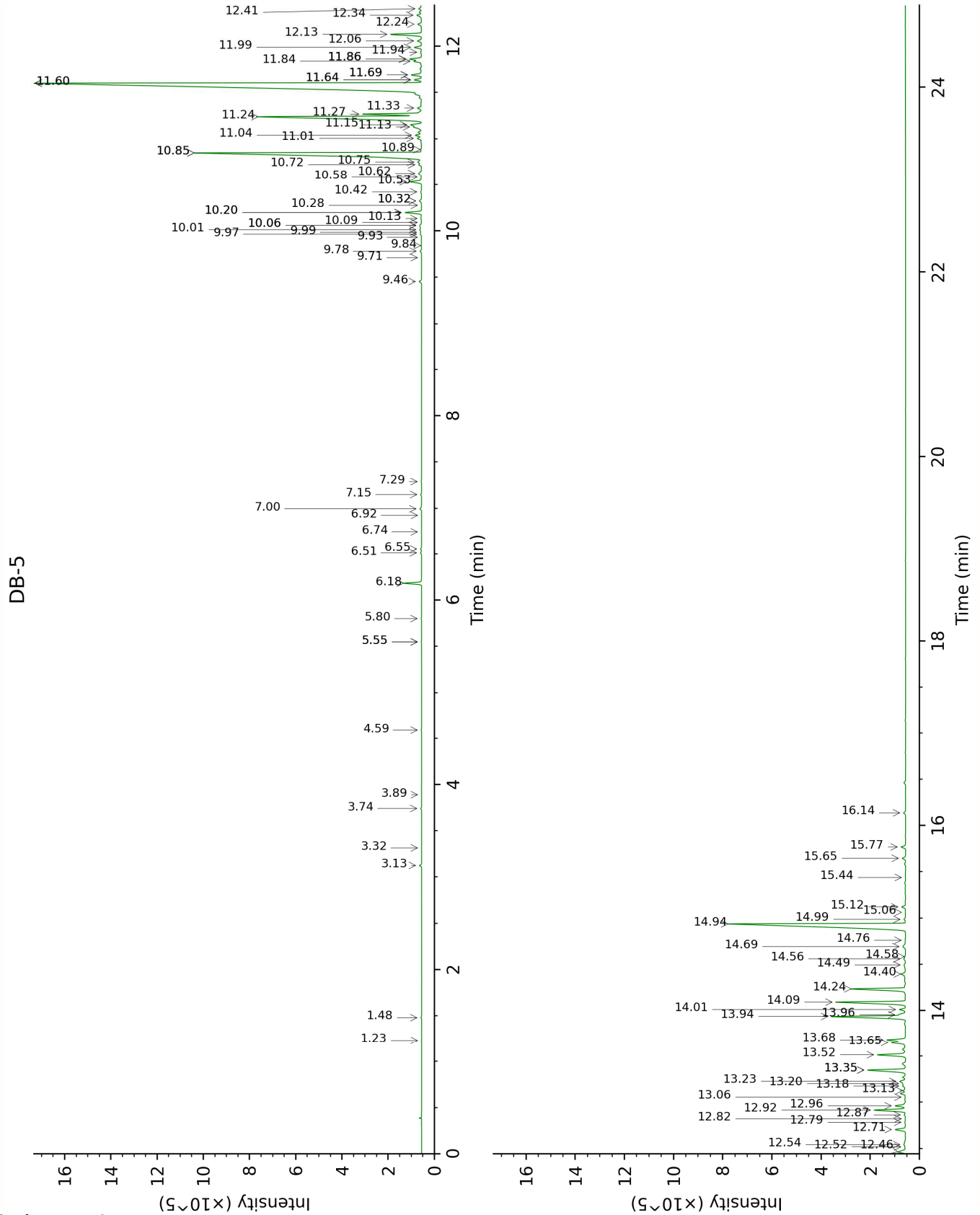
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

1- Methylcyclohexene	Column DB-WAX			Column DB-5		
	0.74	852.9	tr	1.23	762.8	tr
Mesityl oxide	2.50	1089.7	0.03	1.48	797.6	0.02
α -Pinene	1.50	992.9	0.06	3.13	929.9	0.06
Camphene	1.85	1028.5	0.01	3.32	942.4	0.01
β -Pinene	2.26	1067.5	0.03	3.74	970.6	0.03
3-Methyl-3-cyclohexenone	6.32	1370.4	0.01	3.89	980.4	0.01
Limonene	3.38	1158.0	0.02	4.59	1025.4	0.02
Terpinolene	4.49	1238.6	0.01	5.55*	1085.6	[0.02]
<i>para</i> -Cymenene	6.53	1385.7	0.01	5.55*	1085.6	[0.02]
Unknown CEDE I [m/z 95, 150 (45), 110 (35), 107 (23), 109 (21)]	5.95	1344.1	0.02	5.80	1101.4	0.02
Limona ketone	8.00*	1493.6	[0.62]	6.18	1125.9	0.59
α ,4-Dimethyl-3-cyclohexene-1-methanol				6.51	1146.8	0.04
α ,4-Dimethyl-3-cyclohexene-1-methanol epimer				6.55	1149.4	0.04
Borneol	9.97*	1648.1	[0.04]	6.74	1161.2	0.01
Terpinen-4-ol	8.78*	1554.4	[0.45]	6.92	1173.1	tr
4-Methylacetophenone	10.62	1700.9	0.10	7.00	1177.7	0.08
α -Terpineol	9.97*	1648.1	[0.04]	7.15	1187.5	0.03
Unknown MISC XV [m/z 121, 43 (99), 91 (85), 77 (73), 93 (41), 136 (33)... 166 (3)]				7.29	1196.5	0.02
α -Longipinene	7.03	1422.0	0.09	9.46	1343.2	0.09
Longicyclene	7.35	1445.7	0.01	9.71	1361.3	0.01
α -Ylangene	7.30	1441.8	0.04	9.78	1366.2	0.06
α -Copaene	7.40	1449.5	0.03	9.84	1370.5	0.02
Unknown CULO IV [m/z 119, 161 (36), 43 (33), 176 (26), 91 (24), 105 (22)]	12.73	1883.4	0.01	9.93	1376.8	0.01
Unknown CEDE XXVII epimer I [m/z 131, 146 (36), 91 (22), 145 (19), 202 (18)]	8.48	1530.6	0.08	9.97	1379.1	0.04
Unknown CEDE XXXI				9.99	1380.6	0.04

[m/z 43, 120 (84), 145 (79), 105 (75), 93 (40)...]						
(3Z)-Hexenyl (3Z)-hexenoate	10.32	1676.8	0.09	10.01	1382.5	0.09
Unknown CEDE XXVII epimer II [m/z 131, 146 (33), 91 (20), 202 (18)]	8.59	1539.7	0.12	10.06*	1385.8	[0.12]
Sativene	7.78	1477.3	0.04	10.06*	1385.8	[0.12]
β-Elemene	8.68*	1546.4	[0.15]	10.09	1388.0	0.01
β-Longipinene	8.00*	1493.6	[0.62]	10.13	1391.1	0.04
Longifolene	8.24*	1512.3	[0.53]	10.20*	1395.6	[0.61]
Sibirene	8.13	1503.7	0.11	10.20*	1395.6	[0.61]
Unknown CEDE XXXIII [m/z 175, 190 (69), 147 (27), 133 (25), 161 (23)...]				10.28	1401.1	0.01
α-Cedrene	8.24*	1512.3	[0.53]	10.32*	1404.5	[0.10]
(Z)-Vestitenone, or analog	11.94	1813.6	0.07	10.32*	1404.5	[0.10]
Unknown CEDE II [m/z 105, 93 (61), 120 (55), 145 (54), 91 (52)...]	12.50	1863.0	0.05	10.42	1411.7	0.04
Himachala-2,4-diene	8.78*	1554.4	[0.45]	10.53	1419.9	0.48
Unknown CEDE III [m/z 91, 93 (90), 105 (72), 202 (71), 131 (68), 77 (63), 107 (55), 187 (54)]				10.58	1423.7	0.02
Unknown CEDE IV [m/z 105, 91 (70), 93 (65), 43 (61), 120 (57), 145 (50)... 204 (6)]				10.62	1426.9	0.18
<i>trans</i> -α-Bergamotene	8.68*	1546.4	[0.15]	10.72	1434.0	0.10
Himachala-2,4-diene isomer	9.03	1573.7	0.22	10.75	1436.1	0.20
α-Himachalene	9.23	1588.7	13.82	10.85*	1443.6	[14.32]
(<i>E</i>)-Vestitenone	12.43	1857.2	0.49	10.85*	1443.6	[14.32]
α-Humulene	9.53	1612.7	0.06	10.89	1446.3	0.04
Unknown CEDE V [m/z 187, 131 (78), 202 (76), 105 (74), 91 (74), 117 (53), 145	10.20	1667.2	0.29	11.01	1455.3	0.19

(52)]						
(E)-β-Farnesene	9.86*	1639.5	[9.03]	11.04	1457.8	0.24
Unknown CEDE VI [m/z 119, 91 (85), 93 (77), 105 (76), 79 (61), 134 (60), 94 (49), 204 (46)]	9.69	1625.7	0.43	11.13	1464.5	0.38
Unknown CEDE VII [m/z 131, 202 (78), 91 (74), 105 (68), 187 (68), 119 (53), 145 (52)]				11.15	1466.1	0.44
γ-Himachalene	9.86*	1639.5	[9.03]	11.24*†	1472.7	[8.70]
11-αH-Himachala- 1,4-diene	9.89	1642.1	1.64	11.27*†	1474.8	[1.84]
Unknown CEDE VIII [m/z 137, 43 (84), 138 (63), 109 (53), 95 (51), 93 (50), 207 (46)... 222 (21)]	10.42	1685.1	0.12	11.33	1479.7	0.18
(Z)-α-Bisabolene	10.54	1694.4	0.04	11.60*	1499.6	[35.95]
β-Himachalene	10.14	1662.1	36.21	11.60*	1499.6	[35.95]
Cycloisolongifol-5-ol	11.07	1739.5	0.11	11.64*	1502.4	[0.26]
Unknown CEAT I [m/z 105, 119 (89), 91 (69), 159 (62), 131 (42), 93 (41), 202 (38)]				11.64*	1502.4	[0.26]
γ-Cadinene	10.64	1702.6	0.02	11.69*	1506.5	[0.40]
α-Dehydro-ar- himachalene	11.78	1799.2	0.34	11.69*	1506.5	[0.40]
γ-Dehydro-ar- himachalene	12.15	1832.2	0.38	11.84	1518.1	0.28
<i>trans</i> -Calamenene	11.44	1770.7	0.03	11.86*	1519.9	[0.44]
Unknown CEDE IX [m/z 131, 202 (28), 91 (22), 159 (16), 145 (16), 132 (15), 115 (14)]	11.33	1761.5	0.32	11.86*	1519.9	[0.44]
δ-Cadinene	10.67	1705.6	tr	11.86*	1519.9	[0.44]
Unknown CEAT II [m/z 93, 187 (70), 145 (59), 119 (42), 131 (39), 202 (33)]				11.94	1525.8	0.04
ar-Himachalene	11.84	1804.5	0.28	11.99	1529.9	0.28
α-Calacorene	12.35	1849.9	0.14	12.06	1535.3	0.16

(E)- α -Bisabolene	10.97	1730.9	1.13	12.13	1540.9	1.12
Unknown CEDE XXXV [m/z 216, 201 (98), 173 (47), 145 (42), 131 (25), 159 (19)]				12.24	1549.5	0.16
Unknown CEDE X [m/z 189, 91 (85), 43 (74), 105 (67), 133 (66), 107 (63), 135 (52)... 220 (20)]				12.34	1557.2	0.21
(E)-Nerolidol	13.97	1998.0	0.16	12.41	1562.7	0.12
Unknown CEDE XI [m/z 96, 95 (18), 83 (15), 125 (13), 119 (12), 55 (12), 41 (11)... 218? (tr)]	15.08*	2104.8	[0.69]	12.46	1567.2	0.36
Himachalene epoxide	13.03	1911.0	0.27	12.52	1571.4	0.03
Unknown CEDE XII [m/z 177, 202 (79), 91 (76), 159 (75), 43 (65), 107 (59), 105 (57)...]	14.64	2061.8	0.07	12.54	1573.3	0.07
Longiborneol	14.80	2077.2	0.42	12.71	1586.1	0.44
ar-Dihydroturmerone	14.12	2012.3	0.10	12.78	1592.3	0.05
Unknown CEDE XXXVI [m/z 105, 120 (81), 121 (73), 93 (24), 220 (23)]				12.82	1595.2	0.03
Unknown CEDE XXXVII [m/z 159, 131 (17), 201 (17), 115 (13), 160 (12)]				12.86	1598.6	0.06
β -Himachalene oxide	13.39	1944.1	1.31	12.92	1602.7	1.20
Unknown CEDE XIII [m/z 138, 110 (77), 137 (75), 107 (62), 91 (61), 93 (60), 109 (57)... 220 (34)]	13.68	1970.3	0.36	12.96	1606.5	0.43
α -Corocalene	13.90	1991.2	0.03	13.06	1614.2	0.03
Unknown CEDE XIV [m/z 137, 119 (69), 43 (51), 95 (50), 109)40... 222 (1)]	15.08*	2104.8	[0.69]	13.13	1620.1	0.11
Unknown CEDE XXXIX [m/z 120, 105				13.18	1624.2	0.12

(96), 121 (79), 119 (61), 93 (36)...						
6-Methyl-6- <i>meta</i> - tolyl-heptan-2-one	15.92	2188.6	0.03	13.20	1626.4	0.09
Unknown CEDE XV [m/z 119, 163 (80), 107 (64), 95 (61), 93 (57), 91 (53)... 220 (11)]				13.23	1628.4	0.29
Himachalol	15.40	2136.5	1.43	13.35*	1638.4	[1.61]
Unknown CEDE XVI [m/z 119, 91 (44), 94 (36), 107 (35), 93 (29)... 202 (19)...				13.35*	1638.4	[1.61]
Allohimachalol	15.75	2171.4	1.08	13.52	1652.1	1.09
β -Atlantone	15.08*	2104.8	[0.69]	13.65	1663.3	0.59
(<i>E</i>)-10,11- Dihydroatlantone	14.93	2089.4	0.61	13.68	1665.9	0.72
(<i>Z</i>)- γ -Atlantone	15.34	2130.4	2.65	13.94	1686.9	2.97
Deodarone epimer I	15.55*	2151.5	[2.97]	13.96	1688.4	0.19
Deodarone epimer II	15.61	2157.9	0.29	14.01	1693.1	0.23
(<i>E</i>)- γ -Atlantone	15.55*	2151.5	[2.97]	14.09	1699.8	2.78
(<i>Z</i>)- α -Atlantone	15.82	2178.8	1.99	14.24	1712.0	2.12
Unknown CEDE XVII [m/z 105, 119 (89), 59 (68), 120 (65), 43 (65), 93 (62), 121 (61)...				14.40	1725.9	0.20
Unknown CEDE XVIII [m/z 91, 79 (83), 105 (68), 109 (63), 41 (590), 93 (58), 107 (57)...	18.16	2427.2	0.03	14.49	1734.4	0.12
Unknown CEDE XIX [m/z 83, 91 (28), 105 (25), 55 (21), 43 (17), 119 (17)...				14.56	1740.2	0.10
Unknown CEDE XX [m/z 43, 105 (99), 119 (90), 91 (87), 147 (76), 41 (69), 93 (63)...				14.58	1742.3	0.02
Unknown CEDE XXI [m/z 83, 55 (17), 91 (14), 105 (9), 216 (6)...				14.69	1751.6	0.17
Unknown CEDE XXII	18.57	2473.0	0.03	14.76	1757.6	0.03

[m/z 91, 105 (74), 93 (67), 79 (59), 133 (54), 41 (47), 107 (46)...]						
(E)- α -Atlantone	16.57	2255.4	11.37	14.94	1772.9	11.56
Unknown CEDE XLVI [m/z 203, 143 (42), 161 (42), 218 (39), 119 (35)]				14.99	1777.2	0.07
Unknown CEDE XLVII [m/z 203, 161 (67), 69 (62), 143 (53), 218 (37)]				15.06	1783.7	0.01
Unknown CEDE XXIII [m/z 95, 43 (59), 69, (57), 67 (43), 163 (42), 94 (37), 107 (37)... 178 (26), 218 (2)]				15.12	1788.9	0.15
ar-Himachalen-2-ol?				15.44	1817.1	0.01
Unknown CEDE XXIV [m/z 83, 134 (28), 119 (19), 55 (18), 91 (14), 43 (11), 109 (10)... 216 (4), 249? (0)]	20.56	2706.7	0.15	15.65	1835.9	0.13
Unknown CEDE XXV [m/z 83, 134 (30), 119 (19), 55 (18), 91 (12)... 216 (4)...]				15.77	1847.1	0.17
Unknown CEDE XXVI [m/z 173, 83 (83), 91 (80), 201 (79), 115 (65)... 216 (31)]	18.84	2503.1	0.08	16.14	1880.5	0.08
Total reported		94.10%			97.45%	

*: 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