

Date : 2025-08-19

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25H06-PTH04

Customer Identification : Virginian Cedarwood - USA - C70113R

Type : Essential Oil

Source : *Juniperus virginiana*

Customer : Plant Therapy

Checked and approved by:

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

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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 : 2025-08-12

PHYSICOCHEMICAL DATA

Refractive index : 1.5049 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2025-08-06

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
α -Thujene	tr	Monoterpene
α -Pinene	0.08	Monoterpene
Limonene	0.01	Monoterpene
Terpinolene	0.01	Monoterpene
Linalool	0.01	Monoterpenic alcohol
<i>meta</i> -Mentha-4,6-dien-8-ol	0.01	Monoterpenic alcohol
α -Phellandren-8-ol	0.01	Monoterpenic alcohol
Terpinen-4-ol	0.01	Monoterpenic alcohol
α -Terpineol	0.01	Monoterpenic alcohol
Verbenone	0.02	Monoterpenic ketone
Carvacrol methyl ether	0.01	Monoterpenic ether
Brasila-1,10-diene	0.08	Sesquiterpene
Carvacrol	0.03	Monoterpenic alcohol
α -Terpinyl acetate	0.02	Monoterpenic ester
African-1-ene	0.06	Sesquiterpene
2-epi- α -Funebrene	0.80	Sesquiterpene
α -Duprezianene	0.86	Sesquiterpene
Isolongifolene	0.09	Sesquiterpene
β -Elemene	0.17	Sesquiterpene
α -Funebrene	0.30	Sesquiterpene
Unknown	0.17	Sesquiterpene
α -Chamipinene	0.15	Sesquiterpene
β -Funebrene	2.04	Sesquiterpene
α -Cedrene	29.58	Sesquiterpene
β -Cedrene	5.23	Sesquiterpene
β -Duprezianene	0.77	Sesquiterpene
β -Caryophyllene	1.02	Sesquiterpene
<i>cis</i> -Thujopsene	16.99	Sesquiterpene
(<i>Z</i>)- β -Farnesene?	0.05	Sesquiterpene
Isobazzanene	0.19	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.10	Sesquiterpene
Prezizaene	0.25	Sesquiterpene
α -Himachalene	0.12	Sesquiterpene
7,8-Dehydro- α -acoradiene?	0.06	Sesquiterpene
Cadina-4,11-diene	0.06	Sesquiterpene
Thujopsadiene?	0.13	Sesquiterpene
α -Humulene	0.03	Sesquiterpene
α -Acoradiene	0.11	Sesquiterpene
(<i>E</i>)- β -Farnesene	0.30	Sesquiterpene
β -Acoradiene	tr	Sesquiterpene

Thujopsene isomer	0.45	Sesquiterpene
Unknown	0.22	Sesquiterpene
β-Chamigrene	0.05	Sesquiterpene
Unknown	0.24	Sesquiterpene
γ-Himachalene	1.13	Sesquiterpene
Widdra-2,4(14)-diene?	0.03	Sesquiterpene
ar-Curcumene	0.08	Sesquiterpene
Valencene	0.08	Sesquiterpene
Pseudowiddrene	2.06	Sesquiterpene
α-Chamigrene	1.15	Sesquiterpene
β-Himachalene	0.11	Sesquiterpene
α-Cuprenene	0.90	Sesquiterpene
Cuparene	1.02	Sesquiterpene
1,2-Dihydrocuparene	0.16	Sesquiterpene
α-Alaskene	0.37	Sesquiterpene
Unknown	0.38	Sesquiterpene
α-Dehydro-ar-himachalene	0.01	Sesquiterpene
β-Curcumene	0.22	Sesquiterpene
7-epi-α-Selinene	0.03	Sesquiterpene
β-Sesquiphellandrene	0.09	Sesquiterpene
δ-Cadinene	0.01	Sesquiterpene
γ-Cuprenene	1.48	Sesquiterpene
Unknown	0.05	Oxygenated sesquiterpene
(E)-γ-Bisabolene	0.10	Sesquiterpene
Unknown	0.22	Oxygenated sesquiterpene
α-Cadinene	0.05	Sesquiterpene
δ-Cuprenene epimer I	0.13	Sesquiterpene
δ-Cuprenene epimer II	0.24	Sesquiterpene
Unknown	0.08	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.09	Oxygenated sesquiterpene
(E)-Nerolidol	0.01	Sesquiterpenic alcohol
Unknown	0.09	Sesquiterpene
Caryophyllenyl alcohol	0.05	Sesquiterpenic alcohol
Caryophyllene oxide	0.02	Sesquiterpenic ether
Caryophyllene oxide isomer	0.01	Sesquiterpenic ether
allo-Cedrol	0.12	Sesquiterpenic alcohol
Cedrol isomer	0.13	Sesquiterpenic alcohol
α-Cedrol	18.20	Sesquiterpenic alcohol
Widdrol	2.74	Sesquiterpenic alcohol
β-Himachalene oxide	0.01	Sesquiterpenic ether
epi-Cedrol	0.27	Sesquiterpenic alcohol
Unknown	0.01	Oxygenated sesquiterpene
1,10-diepi-Cubenol	0.03	Sesquiterpenic alcohol
Unknown	0.17	Oxygenated sesquiterpene

α -Acorenol	0.03	Sesquiterpenic alcohol
Unknown	0.40	Oxygenated sesquiterpene
Unknown	0.06	Oxygenated sesquiterpene
β -Acorenol	0.06	Sesquiterpenic alcohol
Unknown	0.17	Oxygenated sesquiterpene
Unknown	0.41	Oxygenated sesquiterpene
Himachalol	0.08	Sesquiterpenic alcohol
Unknown	0.08	Oxygenated sesquiterpene
Unknown	0.06	Oxygenated sesquiterpene
Unknown	0.12	Oxygenated sesquiterpene
Cedrenol analog	0.39	Sesquiterpenic alcohol
14-Hydroxy-9-epi-(E)-caryophyllene	0.10	Sesquiterpenic alcohol
1,7-diepi- α -Cedrenal?	0.04	Sesquiterpenic aldehyde
β -Bisabolol	0.23	Sesquiterpenic alcohol
Khusiol	0.16	Sesquiterpenic alcohol
Cedr-8-en-13-ol	0.43	Sesquiterpenic alcohol
α -Bisabolol	0.54	Sesquiterpenic alcohol
α -Cedrenol	0.16	Sesquiterpenic alcohol
Mayurone?	0.12	Norsesquiterpenic ketone
Unknown	0.23	Oxygenated sesquiterpene
Thujopsenal	0.18	Sesquiterpenic aldehyde
Unknown	0.07	Oxygenated sesquiterpene
Thujopsenal analog	0.06	Sesquiterpenic aldehyde
Unknown	0.03	Oxygenated sesquiterpene
Cuparenal	0.05	Sesquiterpenic aldehyde
Unknown	0.10	Oxygenated sesquiterpene
Unknown	0.13	Oxygenated sesquiterpene
β -Acoradienol?	0.25	Sesquiterpenic alcohol
Unknown	0.13	Oxygenated sesquiterpene
Unknown	0.12	Oxygenated sesquiterpene
Unknown	0.16	Oxygenated sesquiterpene
Nootkatone analog	0.04	Sesquiterpenic ketone
Manool	0.01	Diterpenic alcohol
7,13-Abietadiene	0.01	Diterpene
Consolidated total	98.27	

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

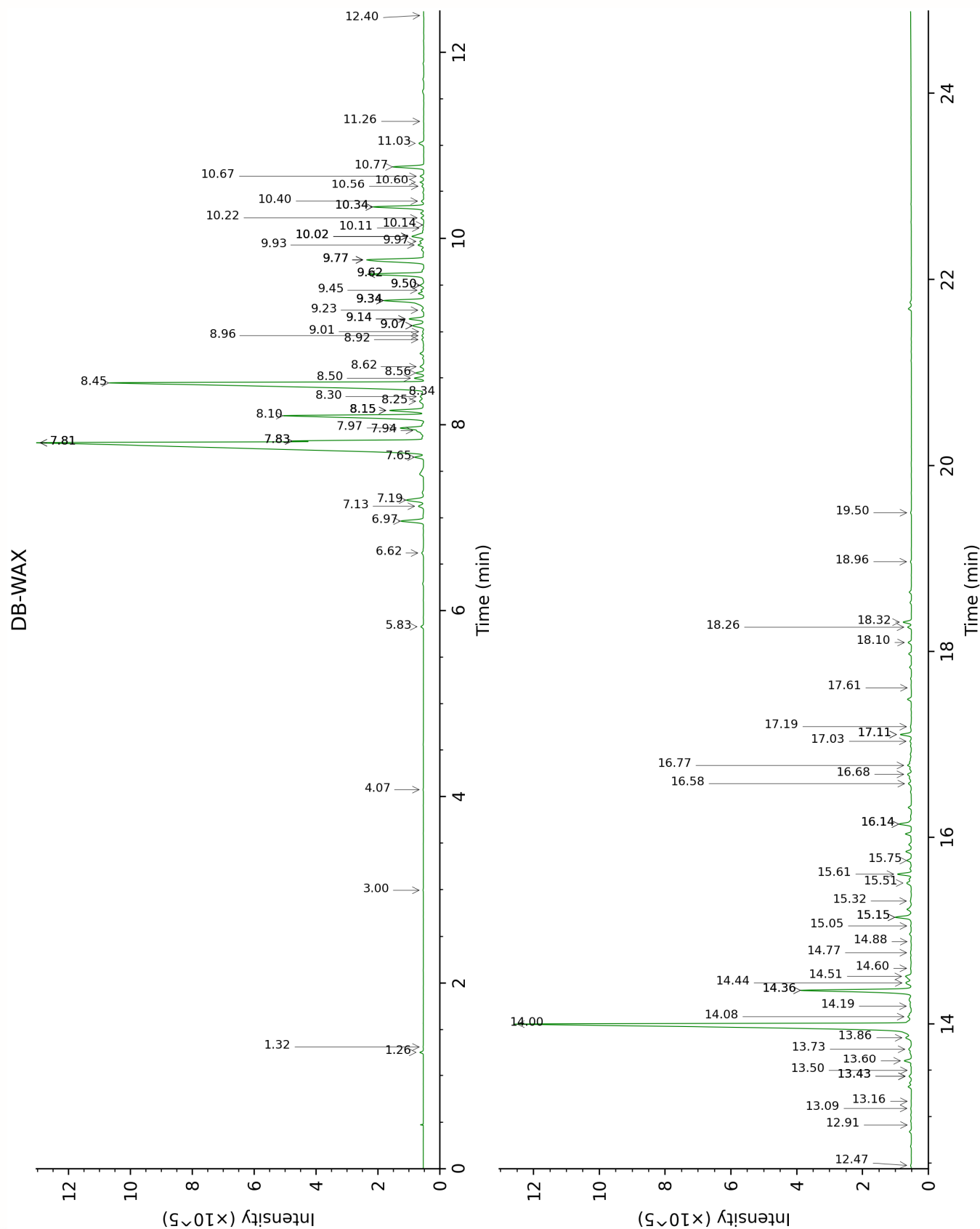
Note: no correction factor was applied

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.

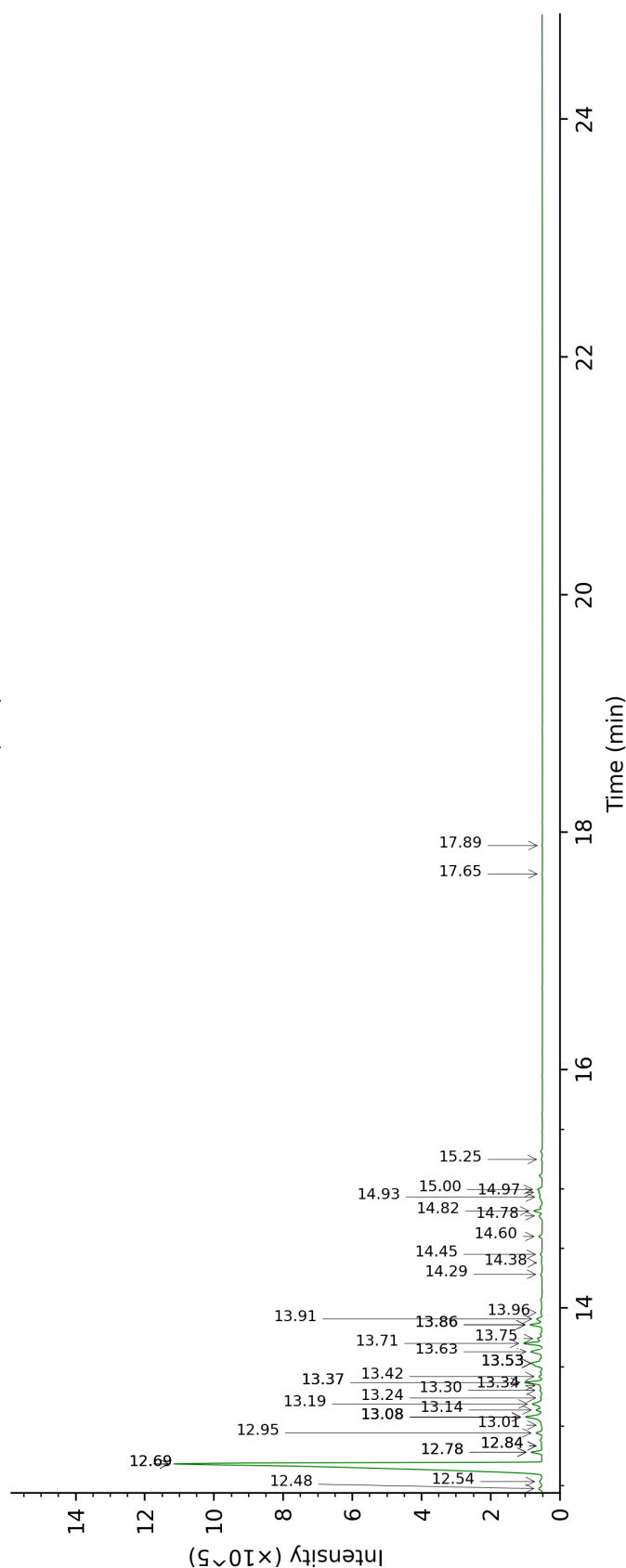
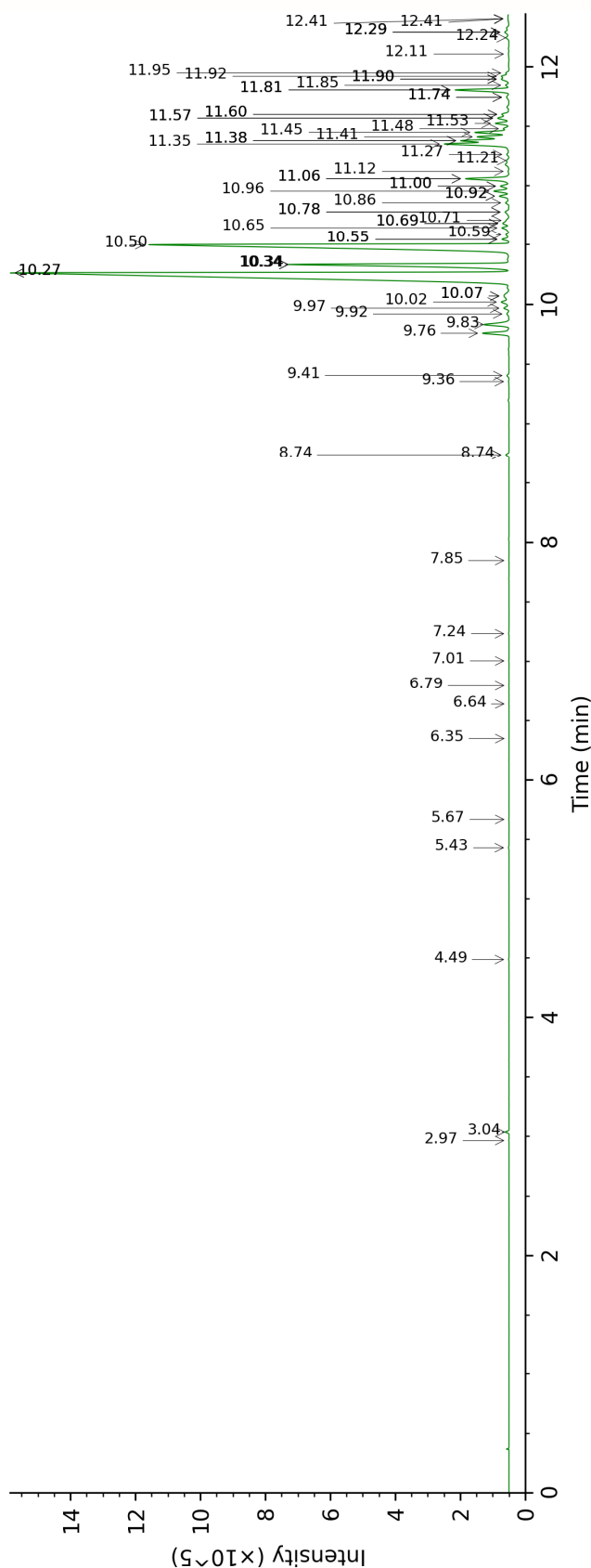
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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

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DB-5



FULL ANALYSIS DATA

α-Thujene	Column DB-WAX			Column DB-5		
	1.32	999.4	tr	2.97	926.2	tr
α-Pinene	1.26	990.5	0.08	3.04	931.0	0.08
Limonene	3.00	1157.0	0.01	4.49	1026.7	0.01
Terpinolene	4.07	1240.6	0.01	5.43	1086.7	0.01
Linalool	7.83*	1516.8	[2.05]	5.67	1101.9	0.01
meta-Mentha-4,6-dien-8-ol	9.07*	1613.8	[0.42]	6.35	1145.8	0.01
α-Phellandren-8-ol	9.93	1683.6	0.18	6.64	1164.7	0.01
Terpinen-4-ol	8.30	1553.6	0.13	6.79	1174.8	0.01
α-Terpineol	9.50*	1648.7	[0.12]	7.01	1188.7	0.01
Verbenone	9.34*	1635.6	[1.50]	7.24	1203.5	0.02
Carvacrol methyl ether	8.34	1556.7	0.04	7.85	1245.3	0.01
Brasila-1,10-diene	5.83	1368.7	0.08	8.74*	1306.3	[0.09]
Carvacrol	15.05	2152.3	0.03	8.74*	1306.3	[0.09]
α-Terpinyl acetate	9.45	1644.5	0.08	9.36	1346.5	0.02
African-1-ene	6.62	1426.3	0.06	9.41	1350.0	0.06
2-epi-α-Funebrene	6.97	1452.3	0.77	9.76	1375.3	0.80
α-Duprezianene	7.19	1469.0	0.65	9.83	1380.4	0.86
Isolongifolene	7.13	1464.1	0.17	9.92	1386.7	0.09
β-Elemene	8.15*	1542.1	[1.10]	9.97	1390.2	0.17
α-Funebrene	7.65	1503.3	0.25	10.02	1393.8	0.30
Unknown JUOX II [m/z 107, 91 (86), 93 (83), 79 (81), 162 (74), 41 (73), 133 (72)... 204 (13)]	7.94	1525.5	0.17	10.07*	1397.4	[0.32]
α-Chamipinene	7.81*	1515.3	[29.39]	10.07*	1397.4	[0.32]
β-Funebrene	7.83*	1516.8	[2.05]	10.26*	1411.4	[31.62]
α-Cedrene	7.81*	1515.3	[29.39]	10.26*	1411.4	[31.62]
β-Cedrene	8.10	1537.7	5.23	10.34*	1416.7	[7.03]
β-Duprezianene	7.97	1527.5	0.77	10.34*	1416.7	[7.03]
β-Caryophyllene	8.15*	1542.1	[1.10]	10.34*	1416.7	[7.03]
cis-Thujopsene	8.45	1565.0	16.68	10.50	1429.2	16.99
(Z)-β-Farnesene?	8.96	1605.1	0.05	10.55*	1432.6	[0.19]
Isobazzanene	8.25	1549.8	0.19	10.55*	1432.6	[0.19]
trans-α-Bergamotene	8.15*	1542.1	[1.10]	10.59	1435.6	0.10
Prezizaene	8.50	1568.9	0.24	10.65	1440.1	0.25
α-Himachalene	8.62	1578.5	0.12	10.69*	1443.0	[0.25]
7,8-Dehydro-α-acoradiene?	9.23	1627.2	0.06	10.69*	1443.0	[0.25]
Cadina-4,11-diene	8.92	1601.8	0.08	10.71	1444.9	0.06

Thujopsadiene?	9.97	1686.7	0.13	10.78*	1450.2	[0.16]
α -Humulene	9.00	1608.6	0.03	10.78*	1450.2	[0.16]
α -Acoradiene	9.07*	1613.8	[0.42]	10.86	1456.0	0.11
(E)- β -Farnesene	9.34*	1635.6	[1.50]	10.92*	1460.3	[0.30]
β -Acoradiene	9.14*	1619.6	[0.45]	10.92*	1460.3	[0.30]
Thujopsene isomer	9.14*	1619.6	[0.45]	10.96	1463.4	0.45
Unknown JUVI III [m/z 118, 69 (82), 91 (51), 117 (40)... 202 (25)]	8.56	1573.3	0.22	11.00*	1466.5	[0.26]
β -Chamigrene	9.34*	1635.6	[1.50]	11.00*	1466.5	[0.26]
Unknown JUVI IV [m/z 91, 105 (93), 161 (77), 93 (73), 119 (71), 133 (69)... 204 (31)]				11.06*	1471.2	[1.38]
γ -Himachalene	9.34*	1635.6	[1.50]	11.06*	1471.2	[1.38]
Widdra-2,4(14)- diene?				11.12	1475.8	0.03
α -Curcumene	10.40	1722.8	0.07	11.21	1482.6	0.08
Valencene	9.62*	1658.3	[1.82]	11.27	1486.5	0.08
Pseudowiddrene	9.62*	1658.3	[1.82]	11.35	1493.0	2.06
α -Chamigrene	9.77*	1670.8	[2.42]	11.38*	1495.1	[1.38]
β -Himachalene	9.50*	1648.7	[0.12]	11.38*	1495.1	[1.38]
α -Cuprenene	9.77*	1670.8	[2.42]	11.41	1497.6	0.90
Cuparene	10.77	1754.6	0.90	11.45	1500.3	1.02
1,2- Dihydrocuparene	10.02*	1691.1	[0.49]	11.48	1502.7	0.16
α -Alaskene	9.77*	1670.8	[2.42]	11.53	1506.0	0.37
Unknown JUVI V [m/z 121, 123 (45), 91 (24), 107 (24), 122 (24), 95 (23)... 204 (11)]	10.02*	1691.1	[0.49]	11.57*	1509.5	[0.39]
α -Dehydro- α - himachalene	11.26	1796.0	0.01	11.57*	1509.5	[0.39]
β -Curcumene	10.02*	1691.1	[0.49]	11.60*	1512.0	[0.25]
7-epi- α -Selinene	10.11	1698.4	0.03	11.60*	1512.0	[0.25]
β - Sesquiphellandrene	10.34*	1717.6	[1.57]	11.74*	1523.3	[0.10]
δ -Cadinene	10.14	1701.2	0.01	11.74*	1523.3	[0.10]
γ -Cuprenene	10.34*	1717.6	[1.57]	11.81*	1528.2	[1.53]
Unknown JUVI VI [m/z 91, 107 (97), 105 (93), 41 (92),				11.81*	1528.2	[1.53]

109 (78), 43 (78), 121 (76), 135 (75)... 220 (21)]						
(E)- γ -Bisabolene	10.22	1707.6	0.08	11.85	1531.3	0.10
Unknown JUVI VII [m/z 43, 95 (81), 207 (61), 41 (55), 55 (50)... 222 (3)]	13.60	2009.4	0.22	11.90*	1535.3	[0.26]
α -Cadinene	10.56	1736.3	0.05	11.90*	1535.3	[0.26]
δ -Cuprenene epimer I	10.60	1740.3	0.13	11.90*	1535.3	[0.26]
δ -Cuprenene epimer II	10.67	1746.0	0.11	11.92	1537.2	0.24
Unknown JUOX VI [m/z 106, 41 (86), 43 (84), 149 (75), 69 (75), 91 (63), 93 (61)... 220 (1)]	11.02	1776.0	0.18	11.95	1539.4	0.08
Unknown JUVI VIII [m/z 91, 119 (98), 121 (91), 105 (85), 43 (82), 41 (76)... 205 (37), 220 (16)]	13.09	1961.4	0.03	12.11	1552.0	0.02
Unknown JUVI IX [m/z 95, 191 (52), 107 (50), 121 (32), 81 (31)...]	13.86	2034.1	0.23	12.24	1562.8	0.09
(E)-Nerolidol	13.50	1999.5	0.01	12.29*	1566.5	[0.16]
Unknown JUAS I [m/z 95, 131 (96), 202 (64), 187 (61), 159 (55), 105 (50)...202 (64)]				12.29*	1566.5	[0.16]
Caryophyllenyl alcohol	13.43*	1993.4	[0.08]	12.29*	1566.5	[0.16]
Caryophyllene oxide	12.48	1904.4	0.02	12.41*	1575.5	[0.05]
Caryophyllene oxide isomer	12.40	1897.2	0.01	12.41*	1575.5	[0.05]
allo-Cedrol	13.73	2022.1	0.11	12.48	1581.1	0.12
Cedrol isomer				12.54	1585.9	0.13
α -Cedrol	14.00	2048.1	18.20	12.68*	1597.6	[20.94]
Widdrol	14.36*	2083.2	[3.58]	12.68*	1597.6	[20.94]
β -Himachalene oxide	12.91	1944.8	0.01	12.78*	1605.4	[0.30]

epi-Cedrol	14.51	2097.8	0.27	12.78*	1605.4	[0.30]
Unknown CEDE XIII [m/z 138, 110 (77), 137 (75), 107 (62), 91 (61), 93 (60), 109 (57)... 220 (34)]	13.16	1968.4	0.01	12.84*	1609.8	[0.04]
1,10-diepi-Cubenol	13.43*	1993.4	[0.08]	12.84*	1609.8	[0.04]
Unknown JUVI XI [m/z 107, 41 (86), 123 (85), 82 (79), 95 (77), 93 (76), 91 (73), 69 (71)... 220 (13)]	14.36*	2083.2	[3.58]	12.94	1618.8	0.17
α-Acorenol	14.19	2066.8	0.04	13.01	1624.2	0.03
Unknown JUVI X [m/z 105, 93 (78), 95 (75), 131 (72), 119 (71), 132 (70), 91 (67), 120 (49)... 202 (39), 220 (9)]	15.61	2208.8	0.40	13.08*	1629.9	[0.70]
Unknown JUVI XII [m/z 132, 175 (22), 119 (18), 91 (18), 157 (18)... 219 (10)]	15.32	2179.2	0.06	13.08*	1629.9	[0.70]
β-Acorenol	14.60	2106.5	0.06	13.08*	1629.9	[0.70]
Unknown JUVI XIII [m/z 132, 91 (24), 119 (22), 105 (21), 133 (17), 117 (16)... 219 (3)]				13.14	1634.8	0.17
Unknown JUVI XV [m/z 123, 81 (77), 95 (77), 107 (72), 41 (72), 93 (66), 55 (64)... 220? (13)]				13.19	1639.0	0.41
Himachalol	14.88	2135.3	0.03	13.24	1643.2	0.08
Unknown JUVI XIV [m/z 41, 91 (96), 79 (88), 69 (82), 123 (80), 93 (80)... 220 (8)]	17.10*	2367.7	[0.33]	13.30	1648.6	0.08
Unknown JUVI XVI [m/z 43, 81 (84), 41 (64), 67 (62), 95 (58), 79 (58)... 204 (48), 220 (2)]	15.15*	2161.6	[0.54]	13.34	1651.9	0.06

Unknown UNKN CLIII [m/z 135, 177 (86), 109 (78), 220 (68), 121 (66), 69 (60)...]	14.08	2055.9	0.12	13.37*	1654.0	[0.51]
Cedrenol analog	16.14*	2264.8	[0.41]	13.37*	1654.0	[0.51]
14-Hydroxy-9-epi- (E)-caryophyllene	16.14*	2264.8	[0.41]	13.42	1658.2	0.10
1,7-diepi- α - Cedrenal?	14.77	2123.4	0.04	13.53*	1667.4	[0.51]
β -Bisabolol	14.44	2090.8	0.23	13.53*	1667.4	[0.51]
Khusiol	15.75	2224.0	0.16	13.53*	1667.4	[0.51]
Cedr-8-en-13-ol	16.58	2310.7	0.12	13.63	1675.5	0.43
α -Bisabolol	15.15*	2161.6	[0.54]	13.70	1681.9	0.54
α -Cedrenol	16.68	2321.5	0.14	13.75	1685.3	0.16
Mayurone?	16.77	2331.9	0.12	13.86*	1695.0	[0.35]
Unknown JUVI XVII [m/z 91, 105 (87), 123 (74), 135 (70), 107 (60), 79 (59)... 220 (13)]				13.86*	1695.0	[0.35]
Thujopsenal	15.51	2198.9	0.19	13.91	1699.0	0.18
Unknown JUVI XVIII [m/z 105, 69 (77), 91 (66), 119 (65), 111 (56), 107 (45), 55 (45)... 220? (2)]	17.19	2376.8	0.06	13.96	1703.4	0.07
Thujopsenal analog	17.10*	2367.7	[0.33]	14.28	1731.3	0.06
Unknown JUVI XIX [m/z 105, 91 (83), 79 (78), 135 (67), 107 (56), 67 (53)... 220 (9)]				14.38	1739.7	0.03
Cuparenal				14.45	1745.8	0.05
Unknown CEDE XXII [m/z 91, 105 (74), 93 (67), 79 (59), 133 (54), 41 (47), 107 (46)...]	18.10	2478.9	0.10	14.60	1758.9	0.10
Unknown JUVI XXI [m/z 121, 136 (47), 119 (27), 91 (27), 105 (22), 41 (21)... 220 (4)]				14.78	1774.0	0.13
β -Acoradienol?				14.82	1777.5	0.25

Unknown JUVI XXII [m/z 189, 91 (48), 133 (40), 105 (40), 41 (34), 187 (34)... 220 (5)]	18.32	2504.0	0.24	14.93	1787.7	0.13
Unknown JUVI XXIII [m/z 148, 141 (99), 91 (74), 105 (52), 41 (42), 121 (42), 133 (37)... 218 (32)]	19.50	2643.7	0.03	14.97	1791.1	0.12
Unknown JUVI XXIV [m/z 121, 136 (53), 91 (22), 93 (19), 79 (15), 105 (13)... 220 (3)]	18.26	2497.7	0.11	15.00	1793.3	0.16
Nootkatone analog	17.61	2424.1	0.01	15.25	1815.6	0.04
Manool	18.96	2579.7	0.03	17.65	2042.3	0.01
7,13-Abietadiene	17.03	2359.8	0.05	17.89	2066.0	0.01
Total reported		95.83%			98.53%	

*: 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