

Date : April 19, 2021

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 21D15-PTH04

Customer identification : Blue Cypress - Australian - BG01082011R

Type : Essential oil

Source : *Callitris intratropica*

Customer : Plant Therapy

ANALYSIS

Method: PC-MAT-014  - Analysis of the composition of an essential oil or other volatile liquid by FAST GC-FID (in French); identifications validated by GC-MS.

Analyst : Sylvain Mercier, M. Sc., Chimiste

Analysis date : April 16, 2021

Checked and approved by :

Alexis St-Gelais, M. Sc., chimiste 2013-174

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PHYSICOCHEMICAL DATA

Physical aspect: Blue viscous liquid

Refractive index: 1.5078 ± 0.0003 (20 °C; method PC-MAT-016)

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
Toluene	0.01	Simple phenolic
Furfural	0.02	Furan
Tricyclene	0.04	Monoterpene
α -Thujene	tr	Monoterpene
α -Pinene	0.65	Monoterpene
Camphene	0.04	Monoterpene
α -Fenchene	0.01	Monoterpene
Thuja-2,4(10)-diene	0.03	Monoterpene
β -Pinene	0.02	Monoterpene
Sabinene	tr	Monoterpene
Unknown	0.01	Monoterpene
Myrcene	0.02	Monoterpene
α -Phellandrene	0.02	Monoterpene
Δ^3 -Carene	0.25	Monoterpene
α -Terpinene	0.02	Monoterpene
para-Cymene	0.05	Monoterpene
Limonene	0.10	Monoterpene
1,8-Cineole	0.03	Monoterpenic ether
β -Phellandrene	0.02	Monoterpene
γ -Terpinene	0.01	Monoterpene
Unknown	0.02	Oxygenated monoterpene
meta-Cymenene	0.04	Monoterpene
Terpinolene	0.01	Monoterpene
para-Cymenene	0.10	Monoterpene
Linalool	0.01	Monoterpenic alcohol
endo-Fenchol	0.02	Monoterpenic alcohol
α -Campholenal	0.03	Monoterpenic aldehyde
trans-Pinocarveol	0.10	Monoterpenic alcohol
Camphor	0.02	Monoterpenic ketone
Isoborneol	0.01	Monoterpenic alcohol
Pinocamphone	0.04	Monoterpenic ketone
Pinocarvone	0.02	Monoterpenic ketone
Borneol	0.09	Monoterpenic alcohol
α -Phellandren-8-ol	0.02	Monoterpenic alcohol
Isopinocamphone	0.04	Monoterpenic ketone
Terpinen-4-ol	0.02	Monoterpenic alcohol
meta-Cymen-8-ol	0.01	Monoterpenic alcohol
para-Cymen-8-ol	0.01	Monoterpenic alcohol
Unknown	0.03	Oxygenated monoterpene
α -Terpineol	0.12	Monoterpenic alcohol
Myrtenal	0.06	Monoterpenic aldehyde
Myrtenol	0.05	Monoterpenic alcohol
Verbenone	0.20	Monoterpenic ketone
trans-Carveol	0.01	Monoterpenic alcohol
Unknown	0.13	Unknown

Unknown	0.08	Oxygenated monoterpene
Unknown	0.02	Unknown
Car-3-en-2-one	0.04	Monoterpenic ketone
Geraniol	0.03	Monoterpenic alcohol
(E)-Anethole	0.01	Phenylpropanoid
Cuminol	0.02	Monoterpenic alcohol
Methyl myrtenate	0.02	Monoterpenic ester
δ-Elemene	0.06	Sesquiterpene
Unknown	0.07	Unknown
cis-β-Elemene	0.02	Sesquiterpene
Myrtenoic acid	2.32	Monoterpenic acid
β-Elemene	0.94	Sesquiterpene
C. intratropica acid I	0.32	Monoterpenic acid
β-Caryophyllene	0.13	Sesquiterpene
C. intratropica acid II	0.44	Monoterpenic acid
cis-Thujopsene	0.05	Sesquiterpene
C. intratropica acid III	0.16	Monoterpenic acid
β-Barbatene	0.03	Sesquiterpene
α-Guaiene	0.27	Sesquiterpene
α-Humulene	0.11	Sesquiterpene
Unknown	0.06	Oxygenated sesquiterpene
4,5-diepi-Aristolochene	0.06	Sesquiterpene
Eudesma-1,4(15),11-triene	1.40	Sesquiterpene
Selina-4,11-diene	1.00	Sesquiterpene
Liguloxide analog II	1.06	Sesquiterpenic ether
β-Selinene	2.39	Sesquiterpene
δ-Selinene	0.18	Sesquiterpene
α-Selinene	2.34	Sesquiterpene
δ-Guaiene	0.59	Sesquiterpene
Unknown	0.14	Oxygenated sesquiterpene
7-epi-α-Selinene	0.19	Sesquiterpene
Selina-4(15),7(11)-diene	0.17	Sesquiterpene
Unknown	0.14	Sesquiterpene
Selina-3,7(11)-diene	0.17	Sesquiterpene
α-Elemol	1.41	Sesquiterpenic alcohol
Unknown	0.05	Oxygenated sesquiterpene
Unknown	0.09	Oxygenated sesquiterpene
Unknown	0.07	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Guaial	11.85	Sesquiterpenic alcohol
Eudesm-5-en-11-ol	0.37	Sesquiterpenic alcohol
Unknown	0.07	Oxygenated sesquiterpene
5,7-diepi-α-Eudesmol	0.18	Sesquiterpenic alcohol
Unknown	0.26	Oxygenated sesquiterpene
Unknown	0.13	Oxygenated sesquiterpene
Eremoligenol?	0.48	Sesquiterpenic alcohol
γ-Eudesmol	6.98	Sesquiterpenic alcohol
Unknown	0.30	Oxygenated sesquiterpene
Hinesol	0.31	Sesquiterpenic alcohol
Unknown	0.34	Oxygenated sesquiterpene
β-Eudesmol	5.97	Sesquiterpenic alcohol
Unknown	0.99	Oxygenated sesquiterpene

α -Eudesmol	3.85	Sesquiterpenic alcohol
Selin-11-en-4 α -ol	0.91	Sesquiterpenic alcohol
Unknown	0.37	Oxygenated sesquiterpene
Hanamyol	0.23	Sesquiterpenic alcohol
Bulnesol	9.34	Sesquiterpenic alcohol
Unknown	0.39	Oxygenated sesquiterpene
Unknown	0.29	Oxygenated sesquiterpene
Unknown	0.16	Oxygenated sesquiterpene
Unknown	0.05	Oxygenated sesquiterpene
Unknown	0.07	Oxygenated sesquiterpene
Unknown	0.36	Oxygenated sesquiterpene
Unknown	0.12	Lignan
Unknown	0.08	Oxygenated sesquiterpene
Chamazulene	0.13	Azulene
Unknown	0.19	Oxygenated sesquiterpene
γ -Costol	3.06	Sesquiterpenic alcohol
Unknown	0.80	Oxygenated sesquiterpene
Unknown	0.12	Oxygenated sesquiterpene
β -Costol	2.36	Sesquiterpenic alcohol
α -Costol	2.06	Sesquiterpenic alcohol
Guaiazulene	0.15	Azulene
Methyl β -costate	0.05	Sesquiterpenic ester
Methyl α -costate?	0.22	Sesquiterpenic ester
Callitrin isomer	0.40	Sesquiterpenic lactone
Callitrin	1.63	Sesquiterpenic lactone
Callitrisin analog I	1.14	Sesquiterpenic lactone
Unknown	0.31	Unknown
Dihydrocolumellarin	10.91	Sesquiterpenic lactone
Unknown	0.55	Unknown
Unknown	0.17	Unknown
Unknown	0.19	Oxygenated sesquiterpene
Unknown	0.02	Sesquiterpenic lactone
Unknown	0.33	Sesquiterpenic lactone
Callitrisin	0.69	Sesquiterpenic lactone
Unknown	1.33	Unknown
Callitrisin analog II	0.19	Sesquiterpenic lactone
Columellarin	0.82	Sesquiterpenic lactone
Unknown	0.18	Sesquiterpenic lactone
Dihydrocallitrisin	0.18	Sesquiterpenic lactone
Unknown	0.12	Sesquiterpenic lactone
Unknown	0.04	Unknown
Sandaracopimarinal?	0.08	Diterpenic aldehyde
6,7-Dehydroferruginol?	0.04	Diterpenic alcohol
Consolidated total	92.17%	

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

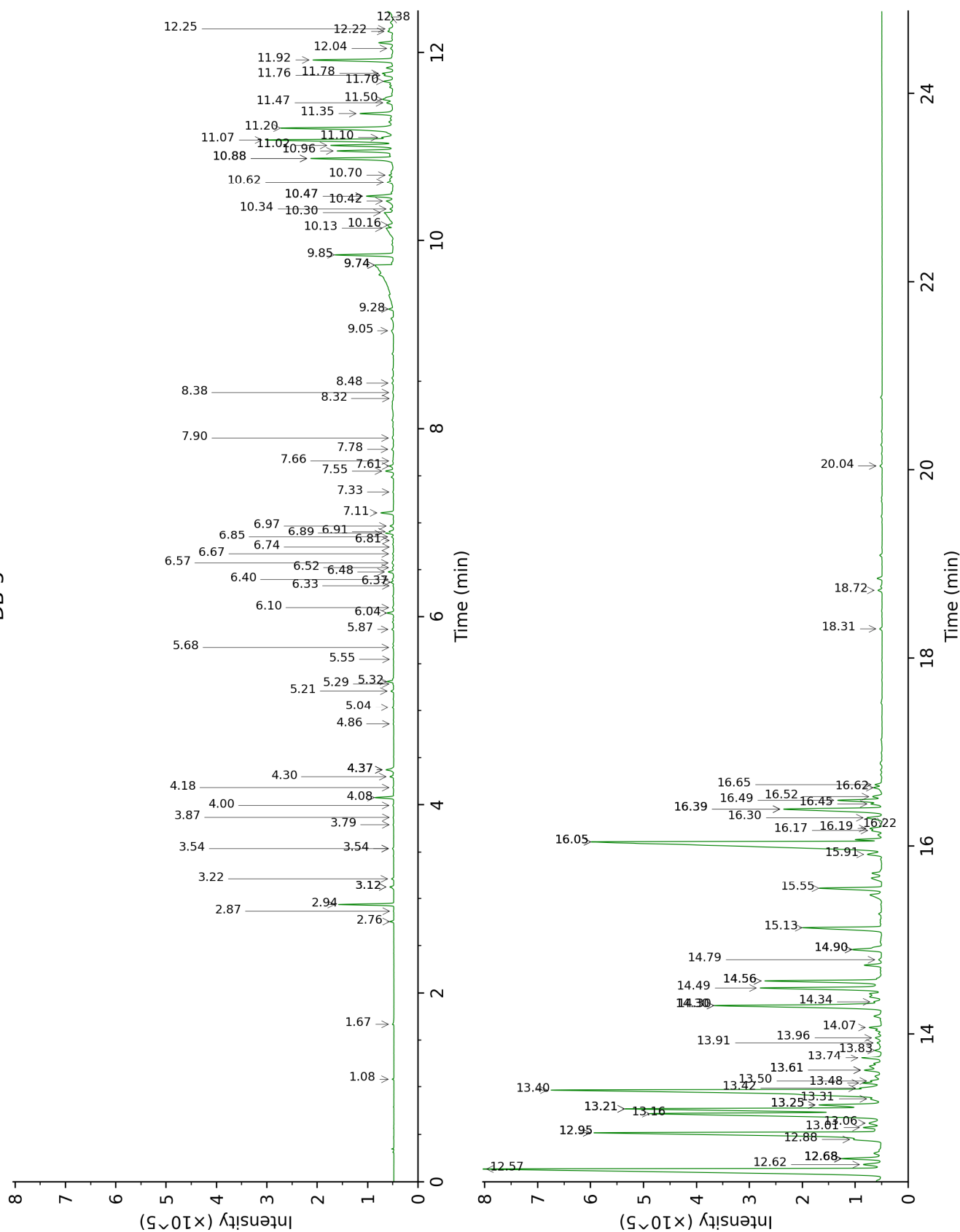
Note: no correction factor was applied

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.

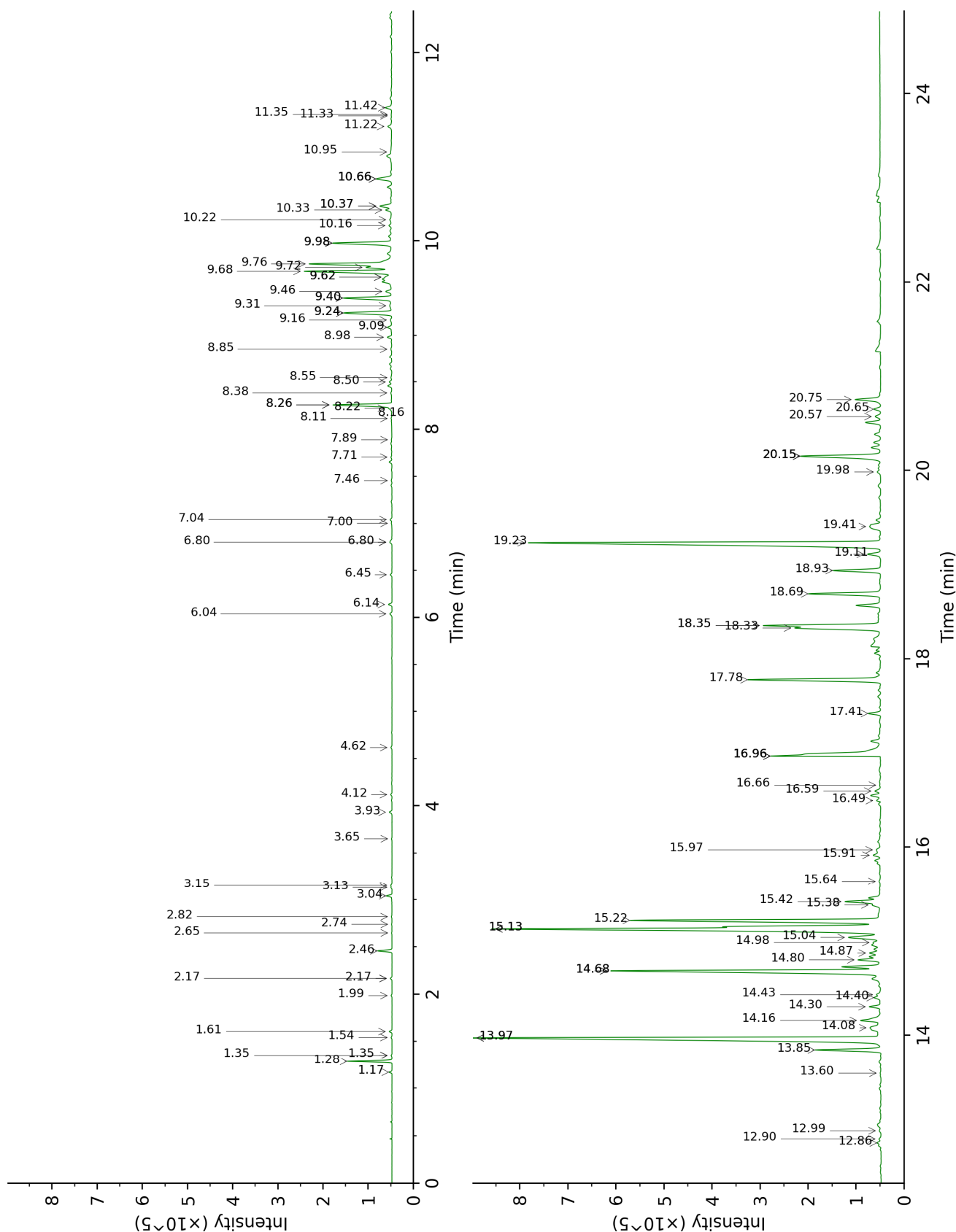
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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

DB-5



DB-WAX



FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Toluene	1.08	758	0.01	1.35*	1002	0.02
Furfural	1.67	829	0.02	6.45	1409	0.04
Tricyclene	2.76	920	0.04	1.17	973	0.04
α -Thujene	2.87	927	tr	1.35*	1002	[0.02]
α -Pinene	2.94	932	0.65	1.28	992	0.65
Camphene	3.12*	944	0.07	1.61	1028	0.04
α -Fenchene	3.12*	944	[0.07]	1.54	1021	0.01
Thuja-2,4(10)-diene	3.22	951	0.03	2.17*	1084	0.03
β -Pinene	3.54*	972	0.02	1.99	1066	0.02
Sabinene	3.54*	972	[0.02]	2.17*	1084	[0.03]
Unknown [m/z 91, 119 (65), 109 (51), 134 (47)]	3.79	989	0.01			
Myrcene	3.87	995	0.02	2.74	1133	0.01
α -Phellandrene	4.00	1003	0.02	2.65	1126	0.01
Δ^3 -Carene	4.08	1008	0.25	2.46	1111	0.25
α -Terpinene	4.18	1015	0.02	2.82	1140	0.02
para-Cymene	4.30	1022	0.05	3.93	1227	0.06
Limonene	4.37*	1027	0.14	3.04	1158	0.10
1,8-Cineole	4.37*	1027	[0.14]	3.16	1166	0.03
β -Phellandrene	4.37*	1027	[0.14]	3.13	1165	0.02
γ -Terpinene	4.86	1058	0.01	3.65	1206	0.01
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	5.04	1069	0.02	4.62	1278	0.03
meta-Cymenene	5.21	1080	0.04	6.04	1379	0.05
Terpinolene	5.29	1085	0.01	4.12	1241	0.03
para-Cymenene	5.32	1087	0.10	6.14	1386	0.07
Linalool	5.55	1102	0.01	7.89	1517	0.01
endo-Fenchol	5.68	1110	0.02	8.16	1538	0.01
α -Campholenal	5.87	1122	0.03	6.80*	1435	0.07
trans-Pinocarveol	6.04	1133	0.10	8.98	1602	0.09
Camphor	6.10	1137	0.02	7.00	1450	0.02
Isoborneol	6.33	1152	0.01	9.16	1617	0.04
Pinocamphone	6.37	1154	0.04	7.04	1453	0.04
Pinocarvone	6.40	1156	0.02	7.70	1503	0.02
Borneol	6.48	1161	0.09	9.62*†	1654	0.36
α -Phellandren-8-ol	6.52	1164	0.02	9.98*	1684	1.42
Isopinocamphone	6.57	1167	0.04	7.46	1484	0.02
Terpinen-4-ol	6.67	1174	0.02	8.38	1556	0.03
meta-Cymen-8-ol	6.74	1178	0.01	11.33	1799	0.01
para-Cymen-8-ol	6.81	1183	0.01	11.35	1800	0.01
Unknown [m/z 93, 59 (85), 81 (36), 92 (35), 43 (34), 121 (20), 136 (16)...]	6.85	1185	0.03			

α -Terpineol	6.89	1188	0.12	9.62*†	1654	[0.36]
Myrtenal	6.91	1189	0.06	8.50	1565	0.06
Myrtenol	6.97	1193	0.05	10.66*	1742	0.46
Verbenone	7.11	1202	0.20	9.40*	1636	1.21
<i>trans</i> -Carveol	7.33	1217	0.01	11.22	1789	0.10
Unknown [m/z 67, 81 (74), 121 (68), 41 (64), 123 (58), 69 (58)...]	7.55	1232	0.13			
Unknown [m/z 79, 107 (80), 121 (74), 91 (71), 150 (63)]	7.60	1235	0.08	10.66*	1742	[0.46]
Unknown [m/z 107, 79 (75), 91 (59), 150 (51), 77 (48), 93 (37)...]	7.66	1239	0.02			
Car-3-en-2-one	7.78	1247	0.04	10.16	1699	0.07
Geraniol	7.90	1255	0.03	11.42	1806	0.15
(<i>E</i>)-Anethole	8.32	1283	0.01	10.95	1766	0.03
Cuminol	8.38	1287	0.02	13.97*	2042	11.86
Methyl myrtenate	8.48	1294	0.02	9.31	1630	0.09
δ -Elemene	9.05	1333	0.06	6.80*	1435	[0.07]
Unknown [m/z 68, 67 (50), 110 (16), 41 (15), 82 (15), 69 (14)...]	9.28	1350	0.07			
<i>cis</i> - β -Elemene	9.74*	1383	2.34	8.11	1535	0.02
Myrtenoic acid	9.74*	1383	[2.34]	16.96*	2348	3.47
β -Elemene	9.85	1390	0.94	8.26*†	1546	[1.34]
C. intratropica acid I	10.13	1410	0.32			
β -Caryophyllene	10.16	1413	0.13	8.22†	1543	1.34
C. intratropica acid II	10.30	1423	0.44			
<i>cis</i> -Thujopsene	10.34	1426	0.05	8.55	1568	0.03
C. intratropica acid III	10.42	1432	0.16			
β -Barbatene	10.47*	1436	0.49	8.85	1593	0.03
α -Guaiene	10.47*	1436	[0.49]	8.26*†	1546	[1.34]
α -Humulene	10.62	1447	0.11	9.09	1611	0.11
Unknown [m/z 107, 150 (72), 123 (64), 79 (61), 121 (54), 93 (54), 91 (53), 135 (45)... 220? (1)]	10.70	1453	0.06			
4,5-diepi-Aristolochene	10.88*	1466	1.46	9.24*	1623	1.17
Eudesma-1,4(15),11-triene	10.88*	1466	[1.46]	9.98*	1684	[1.42]
Selina-4,11-diene	10.96	1472	1.00	9.24*	1623	[1.17]
Liguloxide analog II	11.02	1477	1.06	9.40*	1636	[1.21]
β -Selinene	11.07	1481	2.39	9.68	1660	2.09
δ -Selinene	11.10	1483	0.18	9.46	1642	0.16
α -Selinene	11.20	1490	2.34	9.76	1666	2.23
δ -Guaiene	11.35	1502	0.59	9.72	1663	0.54

Unknown [m/z 43, 121 (83), 93 (54), 123 (50), 105 (47)... 220 (12)]	11.47	1511	0.14	10.66*	1742	[0.46]
7-epi- α -Selinene	11.50	1514	0.19	10.22	1704	0.07
Selina-4(15),7(11)-diene	11.70	1528	0.17	10.37*	1717	0.32
Unknown [m/z 189, 204 (92), 161 (65), 133 (51), 105 (51), 91 (51), 119 (45)]	11.76	1534	0.14	10.33	1713	0.13
Selina-3,7(11)-diene	11.78	1535	0.17	10.37*	1717	[0.32]
α -Elemol	11.92	1546	1.41	13.85	2030	1.41
Unknown [m/z 145, 105 (99), 107 (67), 91 (63), 121 (63), 147 (56), 119 (53)... 218 (37)]	12.04	1556	0.05			
Unknown [m/z 173, 216 (68), 159 (52), 43 (33)]	12.22	1570	0.09	12.86	1937	0.09
Unknown [m/z 173, 216 (66), 159 (39), 174 (22), 43 (20), 201 (19)... 236? (2)]	12.25	1572	0.07	12.99	1949	0.06
Unknown [m/z 43, 91 (87), 121 (69), 191 (66), 206 (64)... 218 (5)]	12.38	1582	0.02	13.60	2005	0.02
Guaial	12.57	1598	11.85	13.97*	2042	[11.86]
Eudesm-5-en-11-ol	12.62	1601	0.37	14.08	2052	0.40
Unknown [m/z 149, 59 (90), 161 (60), 81 (46), 93 (44), 105 (37), 108 (35)... 222? (2)]	12.68*	1606	0.64			
5,7-diepi- α -Eudesmol	12.68*	1606	[0.64]	14.40	2083	0.18
Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)]	12.68*	1606	[0.64]	14.30	2074	0.26
Unknown [m/z 43, 91 (90), 107 (84), 191 (68), 206 (63), 161 (61)... 222 (5)]	12.68*	1606	[0.64]	14.43	2086	0.13
Eremoligenol?	12.88	1623	0.48	14.68*†	2111	7.84
γ -Eudesmol	12.95*	1629	7.27	14.68*†	2111	[7.84]
Unknown [m/z 105, 161 (51), 91 (36), 59 (30), 147 (29), 189	12.95*	1629	[7.27]	14.87	2130	0.30

(24), 204 (23)... 218 (t)]						
Hinesol	13.01	1633	0.31	14.80	2123	0.52
Unknown [m/z 59, 161 (53), 81 (47), 204 (40), 107 (36), 95 (33), 93 (33)... 222 (1)]	13.06	1637	0.34	14.16	2060	0.67
β-Eudesmol	13.16	1646	5.97	15.22	2165	6.18
Unknown [m/z 204, 161 (97), 59 (87), 189 (78), 105 (45)...]	13.21*	1650	5.71	15.04	2147	0.99
α-Eudesmol	13.21*	1650	[5.71]	15.13*†	2156	13.20
Selin-11-en-4α-ol	13.25*	1653	1.28	15.42	2185	0.91
Unknown [m/z 81, 79 (81), 93 (79), 91 (72), 105 (67), 67 (55), 119 (52)...]	13.25*	1653	[1.28]	16.96*	2348	[3.47]
Hanamyol	13.31	1658	0.23	15.38	2181	0.20
Bulnesol	13.40	1666	9.34	15.13*†	2156	[13.20]
Unknown [m/z 162, 147 (84), 91 (36), 105 (21), 107 (17)... 220 (t)]	13.42	1668	0.39			
Unknown [m/z 135, 107 (99), 59 (90), 93 (81), 161 (68), 105 (65)...]	13.48	1672	0.29			
Unknown [m/z 91, 121 (98), 79 (94), 93 (90), 105 (81), 81 (74)... 218 (24)]	13.50	1674	0.16	14.98	2141	0.16
Unknown [m/z 43, 55 (75), 41 (66), 95 (65), 109 (64), 81 (57), 69 (56), 162 (52), 85 (46)... 238 (12)]	13.61*	1683	0.33	12.90	1941	0.05
Unknown [m/z 95, 107 (98), 93 (97), 69 (93), 67 (91), 79 (91)... 218 (49)...]	13.61*	1683	[0.33]	15.64	2207	0.07
Unknown [m/z 91, 175 (90), 105 (85), 81 (82), 119 (80), 93 (76)... 218 (18)]	13.74	1694	0.36	17.41	2397	0.26
Unknown [m/z 133, 93 (97), 131 (85), 145 (83), 107 (69)...220]	13.83	1701	0.12	16.66	2314	0.02
Unknown [m/z 93, 81 (90), 95 (86), 91 (83), 41 (83), 107	13.91	1708	0.08	16.96*	2348	[3.47]

(81)... 220 (29), 238? (4)]						
Chamazulene	13.96	1712	0.13	16.49	2297	0.09
Unknown [m/z 137, 91 (76), 41 (69), 159 (65), 105 (62), 173 (57), 79 (54)... 236 (20)]	14.07	1722	0.19			
γ-Costol	14.30*	1742	3.86	17.78	2438	3.06
Unknown [m/z 91, 105 (86), 93 (67), 79 (63), 119 (60), 159 (63), 77 (52)... 218 (24)]	14.30*	1742	[3.86]			
Unknown [m/z 91, 105 (89), 79 (84), 93 (77), 107 (67), 189 (64), 145 (62), 119 (61)... 220 (16)...]	14.34	1746	0.12			
β-Costol	14.49	1758	2.36	18.35*†	2502	[4.50]
α-Costol	14.56*	1765	2.21	18.33†	2499	4.50
Guaiazulene	14.56*	1765	[2.21]	16.59	2308	0.15
Methyl β-costate	14.79	1785	0.05	15.97	2242	0.17
Methyl α-costate?	14.90*	1794	0.62	15.91	2236	0.22
Callitrin isomer	14.90*	1794	[0.62]	18.35*†	2502	[4.50]
Callitrin	15.13	1814	1.63	18.69	2541	1.71
Callitrisin analog I	15.55	1853	1.14	18.93	2570	1.13
Unknown [m/z 159, 44 (26), 105 (22), 119 (21), 232 (20)]	15.91	1886	0.31	19.11	2590	0.34
Dihydrocolumellarin	16.04*	1898	11.39	19.23	2604	10.91
Unknown [m/z 145, 219 (49), 105 (20), 91 (18), 234 (16)... 256 (t)]	16.04*	1898	[11.39]	19.41	2626	0.55
Unknown [m/z 145, 121 (34), 219 (31), 105 (27), 91 (25), 161 (20)... 256 (5)]	16.17	1909	0.17	20.15*	2716	2.31
Unknown [m/z 204, 119 (71), 91 (69), 105 (63), 131 (58), 143 (57), 93 (53)... 234? (6)]	16.19	1911	0.19			
Unknown [m/z 145, 219 (70), 105 (45), 107 (29)... 234 (25)]	16.22	1914	0.02			
Unknown [m/z 93, 79 (76), 68 (68), 234 (67)]	16.30	1922	0.33			
Callitrisin	16.39*	1931	2.39	20.75	2790	0.69

Unknown [m/z 159, 91 (82), 69 (77), 93 (76), 79 (63), 81 (62)...]	16.39*	1931	[2.39]	20.15*	2716	[2.31]
Callitrisin analog II	16.45	1936	0.19	20.57	2768	0.15
Columellarin	16.49	1940	0.82	20.15*	2716	[2.31]
Unknown [m/z 68, 107 (49), 67 (46), 122 (42)... 234 (18)]	16.52	1943	0.18			
Dihydrocallitrisin	16.62	1952	0.18	20.65	2777	0.16
Unknown [m/z 121, 145 (65), 161 (60), 105 (41), 160 (36)... 234 (23)]	16.65	1955	0.12			
Unknown [m/z 93, 81 (88), 79 (69), 107 (65), 95 (61)...]	18.31	2119	0.04			
Sandaracopimarinal?	18.72	2161	0.08	19.98	2695	0.10
6,7-Dehydroferruginol?	20.04	2302	0.04			
Total identified		89.39%			85.44%	
Total reported		93.75%			89.56%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not 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