

Date : September 23, 2020

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 20114-PTH05

Customer identification : Frankincense carteri - Somaliland - F3010996R

Type : Essential oil

Source : *Boswellia carteri*

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 : September 16, 2020

Checked and approved by :

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

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid

Refractive index: 1.4750 ± 0.0003 (20 °C; method PC-MAT-016)

CONCLUSION

No adulterant or diluent has been detected using this method.

The presence of methyl decyl ether has been suggested as indicative of codistillation of *Boswellia carteri* and *Boswellia occulta*¹. The latter was only recently proposed as a new species² with a distinct chemistry³. It is expected that it takes some time to fully validate the said findings through additional studies.

PhytoChemia does not rule out alternative hypotheses to explain this sample's composition, such as a chemotype of *B. carteri*.

REFERENCES

- (1) Johnson, S.; DeCarlo, A.; Satyal, P.; Dosoky, N.; Sorensen, A.; Setzer, W. Organic Certification Is Not Enough: The Case of the Methoxydecane Frankincense. *Plants* **2019**, *8* (4), 88. <https://doi.org/10.3390/plants8040088>.
- (2) Thulin, M.; DeCarlo, A.; Johnson, S. P. *Boswellia Occulta* (Burseraceae), a New Species of Frankincense Tree from Somalia (Somaliland). *Phytotaxa* **2019**, *394* (3), 219. <https://doi.org/10.11646/phytotaxa.394.3.3>.
- (3) Johnson, S.; DeCarlo, A.; Satyal, P.; Dosoky, N. S.; Sorensen, A.; Setzer, W. N. The Chemical Composition of *Boswellia Occulta* Oleogum Resin Essential Oils. *Nat. Prod. Commun.* **2019**, *14* (7), 1934578X1986630. <https://doi.org/10.1177/1934578X19866307>.

ANALYSIS SUMMARY – CONSOLIDATED CONTENTS

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
(E)-2-Methyl-1,3-pentadiene	tr	Alkene
Unknown	tr	Unknown
Toluene	0.05	Simple phenolic
Methyl hexyl ether	tr	Aliphatic ether
Unknown	0.02	Alkene
Unknown	0.03	Unknown
Unknown	0.02	Unknown
Unknown	0.01	Unknown
Bornylene	tr	Monoterpene
Hashishene	0.16	Monoterpene
Tricyclene	0.06	Monoterpene
α -Thujene	3.16	Monoterpene
α -Pinene	35.35	Monoterpene
α -Fenchene	0.02	Monoterpene
Camphene	0.77	Monoterpene
Thuja-2,4(10)-diene	0.38	Monoterpene
meta-Cymene	0.10	Monoterpene
β -Pinene	1.50	Monoterpene
Sabinene	3.57	Monoterpene
6-Methyl-5-hepten-2-one	0.01	Aliphatic ketone
Dehydro-1,8-cineole	0.06	Monoterpenic ether
Myrcene	4.10	Monoterpene
Pseudolimonene	0.05	Monoterpene
α -Phellandrene	1.76	Monoterpene
ortho-Methylanisole	0.02	Simple phenolic
Δ^3 -Carene	0.74	Monoterpene
α -Terpinene	0.17	Monoterpene
Carvomenthene	0.03	Aliphatic alcohol
ortho-Cymene	tr	Monoterpene
para-Cymene	3.31	Monoterpene
1,8-Cineole	0.15	Monoterpenic ether
β -Phellandrene	0.53	Monoterpene
Limonene	11.67	Monoterpene
Methyl octyl ether	0.47	Aliphatic ether
Cymene analog	0.03	Monoterpene
(Z)- β -Ocimene	0.12	Monoterpene
Unknown	0.02	Unknown
(E)- β -Ocimene	0.07	Monoterpene
γ -Terpinene	0.31	Monoterpene
cis-Sabinene hydrate	0.02	Monoterpenic alcohol
Unknown	0.03	Oxygenated monoterpene
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
Unknown	0.07	Oxygenated monoterpene
meta-Cymenene	0.03	Monoterpene
para-Cymenene	0.06	Monoterpene

Terpinolene	0.10	Monoterpene
6,7-Epoxymyrcene	0.01	Monoterpenic ether
<i>trans</i> -Sabinene hydrate	0.03	Monoterpenic alcohol
Rosefuran	0.02	Monoterpenic ether
Perillene	0.08	Monoterpenic ether
Linalool	0.11	Monoterpenic alcohol
Isoamyl 2-methylbutyrate	0.03	Aliphatic ester
α -Thujone	0.02	Monoterpenic ketone
Unknown	0.02	Monoterpenic alcohol
Verbenol analog?	0.04	Monoterpenic alcohol
β -Thujone	0.12	Monoterpenic ketone
<i>cis</i> -para-Menth-2-en-1-ol	0.06	Monoterpenic alcohol
<i>trans</i> -para-Mentha-2,8-dien-1-ol	0.03	Monoterpenic alcohol
α -Campholenal	0.26	Monoterpenic aldehyde
Unknown	0.07	Unknown
<i>cis</i> -Limonene oxide	0.02	Monoterpenic ether
allo-Ocimene	0.01	Monoterpene
Methyl nonyl ether	0.10	Aliphatic ether
<i>trans</i> -Pinocarveol	0.62	Monoterpenic alcohol
<i>trans</i> -Sabinol	0.20	Monoterpenic alcohol
<i>trans</i> -Verbenol	0.52	Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.22	Monoterpenic alcohol
Sabinaketone	0.04	Normonoterpenic ketone
Pinocamphone	0.02	Monoterpenic ketone
Unknown	0.02	Oxygenated monoterpene
Pinocarvone	0.06	Monoterpenic ketone
Borneol	0.09	Monoterpenic alcohol
Isopinocamphone	0.03	Monoterpenic ketone
α -Phellandren-8-ol	0.54	Monoterpenic alcohol
Umbellulone	0.06	Monoterpenic ketone
<i>cis</i> -Sabinol	0.02	Monoterpenic alcohol
meta-Cymen-8-ol	0.01	Monoterpenic alcohol
Thuj-3-en-10-al	0.02	Monoterpenic aldehyde
para-Cymen-8-ol	0.15	Monoterpenic alcohol
α -Terpineol	0.52	Monoterpenic alcohol
Myrtenol	0.24	Monoterpenic alcohol
<i>trans</i> -Isopiperitenol	0.04	Monoterpenic alcohol
<i>cis</i> - α -Phellandrene epoxide (IPP vs Me)	0.12	Monoterpenic ether
Verbenone	0.44	Monoterpenic ketone
<i>trans</i> -Piperitol	0.04	Monoterpenic alcohol
Octyl acetate	0.07	Aliphatic ester
<i>trans</i> -Carveol	0.25	Monoterpenic alcohol
<i>cis</i> -Carveol	0.01	Monoterpenic alcohol
Methyl decyl ether	2.09	Aliphatic ether
Hexyl 2-methylbutyrate	0.06	Aliphatic ester
Carvone	0.18	Monoterpenic ketone
Carvotanacetone	0.03	Monoterpenic ketone
Hexyl isovalerate	0.02	Aliphatic ester
Piperitone	0.05	Monoterpenic ketone
Unknown	0.02	Unknown
Linalyl acetate	0.01	Monoterpenic ester
3,5-Dimethoxytoluene	0.06	Simple phenolic

Unknown	0.05	Oxygenated monoterpene
Unknown	0.01	Unknown
Decanol	0.14	Aliphatic alcohol
Bornyl acetate	0.32	Monoterpenic ester
para-Cymen-7-ol	0.05	Monoterpenic alcohol
<i>trans</i> -Pinocarvyl acetate	0.03	Monoterpenic ester
Thymol	0.01	Monoterpenic alcohol
Carvacrol	0.02	Monoterpenic alcohol
Unknown	0.10	Unknown
Unknown	0.02	Unknown
Unknown	0.03	Oxygenated monoterpene
Bicycloelemene	0.05	Sesquiterpene
Unknown	0.02	Unknown
α -Terpinyl acetate	0.08	Monoterpenic ester
α -Cubebene	0.27	Sesquiterpene
Cyclosativene I	0.03	Sesquiterpene
Cyclosativene II	0.06	Sesquiterpene
α -Copaene	0.83	Sesquiterpene
1,5-diepi- β -Bourbonene	0.04	Sesquiterpene
β -Bourbonene	0.41	Sesquiterpene
β -Cubebene	0.10	Sesquiterpene
β -Elemene	1.13	Sesquiterpene
Unknown	0.02	Unknown
α -Gurjunene	0.11	Sesquiterpene
β -Caryophyllene	3.13	Sesquiterpene
<i>cis</i> - α -Bergamotene	0.03	Sesquiterpene
β -Copaene	0.09	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.17	Sesquiterpene
6,9-Guaiadiene	0.02	Sesquiterpene
<i>trans</i> -Muurolo-3,5-diene	0.10	Sesquiterpene
α -Humulene	0.82	Sesquiterpene
allo-Aromadendrene	0.21	Sesquiterpene
<i>cis</i> -Muurolo-4(15),5-diene	0.02	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.15	Sesquiterpene
γ -Muurolole	0.42	Sesquiterpene
Germacrene D	0.37	Sesquiterpene
β -Selinene	0.60	Sesquiterpene
<i>trans</i> -Muurolo-4(15),5-diene	0.27	Sesquiterpene
α -Selinene	0.43	Sesquiterpene
epi-Cubebol	0.15	Sesquiterpenic alcohol
α -Muurolole	0.28	Sesquiterpene
γ -Cadinene	0.56	Sesquiterpene
Cubebol	0.26	Sesquiterpenic alcohol
β -Bisabolene	0.04	Sesquiterpene
<i>trans</i> -Calamenene	0.05	Sesquiterpene
δ -Cadinene	1.25	Sesquiterpene
Zonarene	0.10	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.08	Sesquiterpene
α -Cadinene	0.07	Sesquiterpene
α -Calacorene	0.04	Sesquiterpene
Isocaryophyllene epoxide B	0.03	Sesquiterpenic ether
α -Elemol	0.12	Sesquiterpenic alcohol

Germacrene B	0.17	Sesquiterpene
Elemicin	0.03	Phenylpropanoid
Palustrol	0.03	Sesquiterpenic alcohol
Unknown	0.09	Oxygenated sesquiterpene
Germacrene D-4-ol	0.07	Sesquiterpenic alcohol
Caryophyllene oxide	0.80	Sesquiterpenic ether
Caryophyllene oxide isomer	0.04	Sesquiterpenic ether
Viridiflorol	0.24	Sesquiterpenic alcohol
Salvial-4(14)-en-1-one	0.03	Aliphatic alcohol
Copaborneol	0.13	Sesquiterpenic alcohol
Unknown	0.39	Sesquiterpenic alcohol
10-epi-Cubenol	0.09	Sesquiterpenic alcohol
1-epi-Cubenol	0.13	Sesquiterpenic alcohol
τ -Cadinol	0.55	Sesquiterpenic alcohol
τ -Muurolol	0.05	Sesquiterpenic alcohol
α -Muurolol	0.06	Sesquiterpenic alcohol
β -Eudesmol	0.12	Sesquiterpenic alcohol
α -Eudesmol	0.07	Sesquiterpenic alcohol
α -Cadinol	0.05	Sesquiterpenic alcohol
(3Z)-Caryophylla-3,8(13)-dien-5 β -ol	0.08	Sesquiterpenic alcohol
Germacra-4(15),5,10(14)-trien-1 α -ol	0.01	Sesquiterpenic alcohol
Shyobunol	0.02	Sesquiterpenic alcohol
α -Phellandrene dimer I	0.01	Diterpene
α -Phellandrene dimer II	0.14	Diterpene
α -Phellandrene dimer III	0.04	Diterpene
α -Phellandrene dimer IV	0.02	Diterpene
Unknown	0.02	Unknown
(3E)-Cembrene A	0.31	Diterpene
para-Camphorene	0.02	Diterpene
Cembrene C	0.11	Diterpene
Verticilla-4(20),7,11-triene	0.08	Diterpene
Cembrenol	0.15	Diterpenic alcohol
Serratol	0.90	Diterpenic alcohol
Incensole	0.44	Diterpenic alcohol
Consolidated total	96.33%	

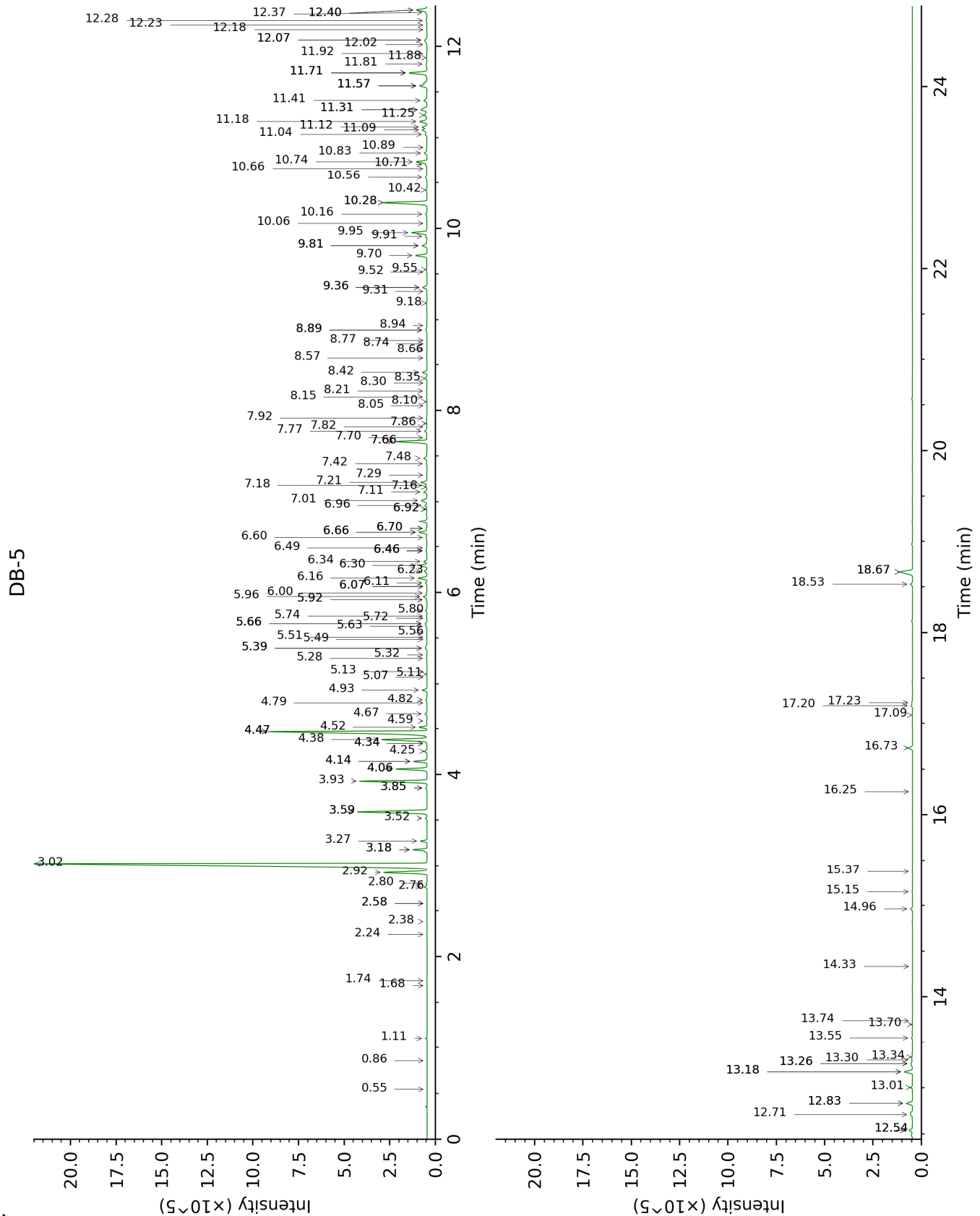
tr: The compound has been detected below 0.005% of total signal.

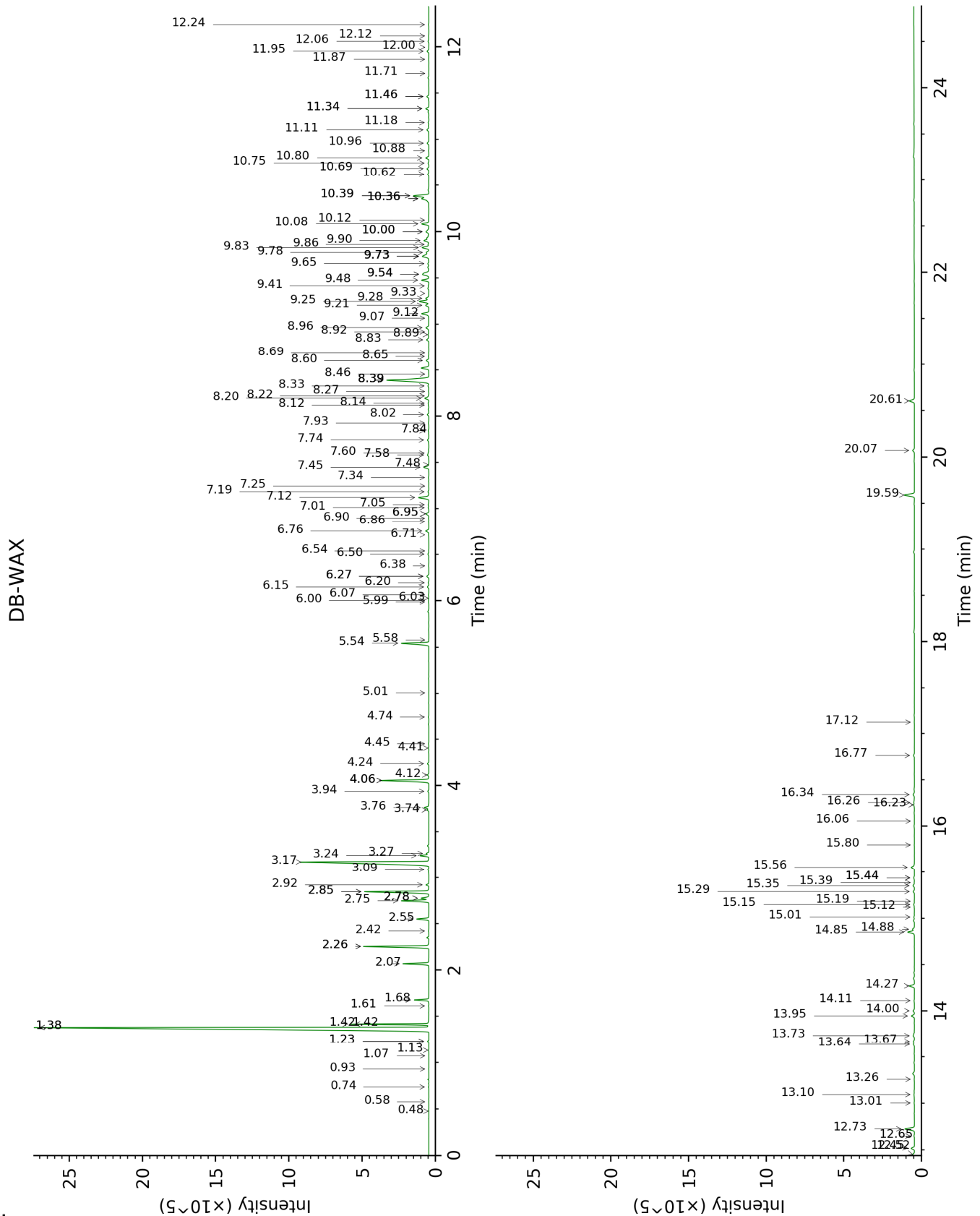
Note: no correction factor was applied

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.





FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
(E)-2-Methyl-1,3-pentadiene	0.54	627	tr	0.48	766	tr
Unknown [m/z 93, 91 (70), 77 (48), 108 (42)]	0.86	721	tr	0.58	820	tr
Toluene	1.11	758	0.05	1.42*†	1000	[38.28]
Methyl hexyl ether	1.68	826	tr	0.93	921	tr
Unknown [m/z 109, 67 (32), 81 (14), 41 (12), 124 (10)]	1.74	831	0.02	0.74	878	0.01
Unknown [m/z 79, 78 (45), 91 (28), 77 (28), 41 (13), 80 (12), 107 (11)... 122 (1)]	2.24	874	0.03	1.13	954	0.02
Unknown [m/z 119, 91 (35), 79 (17), 77 (13), 120 (11), 117 (9)... 134 (1)]	2.38	886	0.02	1.23*	971	0.07
Unknown [m/z 93, 91 (72), 121 (58), 77 (49), 79 (41), 43 (22), 105 (20), 107 (20), 41 (18), 136 (17), 92 (17)]	2.58*	903	0.01			
Bornylene	2.58*	903	[0.01]	1.07	944	tr
Hashishene	2.76	915	0.16	1.38*†	996	38.28
Tricyclene	2.80	918	0.06	1.23*	971	[0.07]
α-Thujene	2.92	926	3.16	1.42*†	1000	[38.28]
α-Pinene	3.02	932	35.35	1.38*†	996	[38.28]
α-Fenchene	3.18*	943	0.88	1.62	1020	0.02
Camphene	3.18*	943	[0.88]	1.68	1026	0.77
Thuja-2,4(10)-diene	3.27	949	0.38	2.26*	1083	3.95
meta-Cymene	3.52	966	0.10	2.85*	1132	4.17
β-Pinene	3.59*	970	5.15	2.07	1065	1.50
Sabinene	3.59*	970	[5.15]	2.26*	1083	[3.95]
6-Methyl-5-hepten-2-one	3.85*	988	0.11	5.01	1293	0.01
Dehydro-1,8-cineole	3.85*	988	[0.11]	3.09	1151	0.06
Myrcene	3.93	993	4.10	2.85*	1132	[4.17]
Pseudolimonene	4.06*	1002	1.92	2.78*	1127	0.52
α-Phellandrene	4.06*	1002	[1.92]	2.75	1125	1.76
ortho-Methylanisole	4.14*	1007	0.81	5.99	1362	0.02

Δ3-Carene	4.14*	1007	[0.81]	2.55	1109	0.74
α-Terpinene	4.26	1014	0.17	2.92	1138	0.17
Carvomenthene	4.34*	1019	0.03	2.42	1099	0.03
ortho-Cymene	4.34*	1019	[0.03]	4.06*	1224	3.32
para-Cymene	4.38	1022	3.31	4.06*	1224	[3.32]
1,8-Cineole	4.47*	1027	12.50	3.27	1165	0.15
β-Phellandrene	4.47*	1027	[12.50]	3.24	1163	0.53
Limonene	4.47*	1027	[12.50]	3.18	1158	11.67
Methyl octyl ether	4.52	1030	0.47	2.78*	1127	[0.52]
Cymene analog	4.59	1034	0.03	4.45	1253	0.03
(Z)-β-Ocimene	4.66	1039	0.12	3.74†	1201	0.43
Unknown [m/z 109, 43 (57), 91 (28), 67 (25), 93 (24), 95 (22), 77 (21), 137 (21), 41 (17), 79 (14)...]	4.78	1047	0.02			
(E)-β-Ocimene	4.82	1049	0.07	3.94	1216	0.07
γ-Terpinene	4.93	1056	0.31	3.76†	1203	[0.43]
cis-Sabinene hydrate	5.07	1065	0.02	6.90	1428	0.03
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	5.11	1067	0.03	4.74	1274	0.04
cis-Linalool oxide (fur.)	5.14	1069	0.01	6.54	1402	0.02
Unknown [m/z 43, 94 (63), 109 (61), 59 (55), 79 (51)...152 (2)]	5.28	1078	0.07	7.19	1450	0.07
meta-Cymenene	5.32	1080	0.03	6.20	1377	0.05
para-Cymenene	5.39*	1085	0.22	6.27*	1382	0.17
Terpinolene	5.39*	1085	[0.22]	4.24	1238	0.10
6,7-Epoxyborneol	5.49	1091	0.01	6.07	1367	0.03
trans-Sabinene hydrate	5.51	1092	0.03	7.93	1506	0.05
Rosefuran	5.56	1096	0.02	6.00	1363	0.03
Perillene	5.63	1100	0.08	6.15	1373	0.12
Linalool	5.66*	1102	0.15	8.02	1513	0.11
Isoamyl 2-methylbutyrate	5.66*	1102	[0.15]	4.40	1250	0.03
α-Thujone	5.66*	1102	[0.15]	6.03	1365	0.02
Unknown [m/z 119, 109 (94), 43 (61), 95 (56), 91 (48), 77 (32), 152 (32), 137 (31), 134 (24)]	5.72	1106	0.02	8.46	1547	0.01
Verbenol analog?	5.74	1107	0.04	8.27	1532	0.03
β-Thujone	5.80	1111	0.12	6.27*	1382	[0.17]

<i>cis</i> -para-Menth-2-en-1-ol	5.92*	1118	0.08	8.14	1522	0.06
<i>trans</i> -para-Mentha-2,8-dien-1-ol	5.92*	1118	[0.08]	8.92	1583	0.03
α -Campholenal	5.96	1121	0.26	6.95*	1432	0.26
Unknown [m/z 111, 43 (22), 55 (14), 41 (12), 110 (11)...]	6.00	1123	0.07			
<i>cis</i> -Limonene oxide	6.07*	1128	0.03	6.38	1390	0.02
allo-Ocimene	6.07*	1128	[0.03]	5.58	1332	0.01
Methyl nonyl ether	6.10	1130	0.10	4.12	1229	0.10
<i>trans</i> -Pinocarveol	6.16	1134	0.62	9.12	1598	0.63
<i>trans</i> -Sabinol	6.23	1138	0.20	9.73*	1648	0.76
<i>trans</i> -Verbenol	6.30	1142	0.52	9.48	1627	0.56
meta-Mentha-4,6-dien-8-ol	6.34	1145	0.22	9.28	1612	0.26
Sabinaketone	6.46*	1152	0.07	8.65	1562	0.04
Pinocamphone	6.46*	1152	[0.07]	7.25	1455	0.02
Unknown [m/z 97, 81 (96), 109 (80), 43 (53), 53 (40), 41 (36), 56 (29), 95 (25)... 152 (1)]	6.46*	1152	[0.07]	7.48	1472	0.02
Pinocarvone	6.49	1154	0.06	7.84	1499	0.05
Borneol	6.60	1162	0.09	9.73*	1648	[0.76]
Isopinocamphone	6.66*	1165	0.56	7.60	1481	0.03
α -Phellandren-8-ol	6.66*	1165	[0.56]	10.08	1677	0.54
Umbellulone	6.70*	1168	0.08	8.89	1580	0.06
<i>cis</i> -Sabinol	6.70*	1168	[0.08]	10.88	1743	0.02
meta-Cymen-8-ol	6.92*	1182	0.05	11.46*	1793	0.16
Thuj-3-en-10-al	6.92*	1182	[0.05]	8.68	1564	0.02
para-Cymen-8-ol	6.96	1184	0.15	11.46*	1793	[0.16]
α -Terpineol	7.02	1188	0.52	9.73*	1648	[0.76]
Myrtenol	7.11	1194	0.24	10.80	1737	0.24
<i>trans</i> -Isopiperitenol	7.16	1197	0.04	10.39*	1702	1.28
<i>cis</i> - α -Phellandrene epoxide (IPP vs Me)	7.18	1198	0.12	10.96	1750	0.15
Verbenone	7.21	1201	0.44	9.54*	1633	0.84
<i>trans</i> -Piperitol	7.29	1206	0.04	10.36*	1699	0.76
Octyl acetate	7.42	1214	0.07	7.05	1440	0.06
<i>trans</i> -Carveol	7.48	1218	0.25	11.34*†	1782	0.31
<i>cis</i> -Carveol	7.66*	1230	2.11	11.71	1815	0.01
Methyl decyl ether	7.66*	1230	[2.11]	5.54	1330	2.09
Hexyl 2-methylbutyrate	7.70	1233	0.06	6.50	1399	0.08
Carvone	7.77	1238	0.18	10.00*	1670	0.33

Carvotanacetone	7.82	1241	0.03	9.41	1622	0.05
Hexyl isovalerate	7.86	1243	0.02	6.71	1415	0.03
Piperitone	7.92	1247	0.05	9.86	1659	0.06
Unknown [m/z 109, 124 (22), 110 (11), 95 (10), 43 (6), 41 (6)...]	8.05	1256	0.02			
Linalyl acetate	8.10	1259	0.01	8.12	1521	0.04
3,5-Dimethoxytoluene	8.15	1263	0.06	11.34*†	1782	[0.31]
Unknown [m/z 109, 41 (22), 81 (14), 43 (11)... 152 (4)]	8.21	1267	0.05			
Unknown [m/z 83, 69 (66), 43 (65), 98 (38), 41 (36), 55 (32)...]	8.30	1273	0.01			
Decanol	8.35	1276	0.14	10.68	1727	0.15
Bornyl acetate	8.42	1281	0.32	8.20	1526	0.35
para-Cymen-7-ol	8.58	1291	0.05	14.11	2034	0.04
trans-Pinocarvyl acetate	8.66	1297	0.03	9.07	1594	0.04
Thymol	8.74	1301	0.01	15.12	2132	0.02
Carvacrol	8.77	1304	0.02	15.39	2159	0.02
Unknown [m/z 69, 41 (75), 55 (58), 83 (33), 121 (33)...]	8.89*	1312	0.12			
Unknown [m/z 111, 126 (93), 43 (90), 71 (60)...]	8.89*	1312	[0.12]	15.18	2139	0.02
Unknown [m/z 150, 107 (98), 91 (79), 108 (61)]	8.94	1315	0.03	12.00	1840	0.01
Bicycloelemene	9.18	1333	0.05	7.01	1437	0.06
Unknown [m/z 133, 105 (45), 91 (38), 119 (36)... 150 (3)]	9.31	1342	0.02			
α-Terpinyl acetate	9.36*	1345	0.33	9.65	1642	0.08
α-Cubebene	9.36*	1345	[0.33]	6.76	1418	0.27
Cyclosativene I	9.52	1356	0.03	6.86	1426	0.03
Cyclosativene II	9.55	1358	0.06	6.95*	1432	[0.26]
α-Copaene	9.70	1369	0.83	7.12	1445	0.86
1,5-diepi-β-Bourbonene	9.81*	1377	0.43	7.34	1461	0.04
β-Bourbonene	9.81*	1377	[0.43]	7.45	1470	0.41
β-Cubebene	9.91	1384	0.10	7.74	1492	0.14
β-Elemene	9.95	1387	1.13	8.39*	1542	4.43
Unknown [m/z 71, 100 (92), 111 (79), 69 (46), 109 (45)...]	10.06	1394	0.02	17.12	2339	0.02

α -Gurjunene	10.16	1401	0.11	7.58	1480	0.13
β -Caryophyllene	10.28*	1411	3.29	8.39*	1542	[4.43]
<i>cis</i> - α -Bergamotene	10.28*	1411	[3.29]	8.22	1528	0.03
β -Copaene	10.42	1421	0.09	8.33	1537	0.08
<i>trans</i> - α -Bergamotene	10.56	1431	0.17	8.39*	1542	[4.43]
6,9-Guaiadiene	10.66	1439	0.02	8.60	1558	0.23
<i>trans</i> -Muuro-la-3,5-diene	10.71	1442	0.10	8.83	1576	0.21
α -Humulene	10.74	1444	0.82	9.25	1609	0.82
allo-Aromadendrene	10.83	1452	0.21	8.96	1586	0.29
<i>cis</i> -Muuro-la-4(15),5-diene	10.89	1456	0.02	9.33	1616	0.02
<i>trans</i> -Cadina-1(6),4-diene	11.04	1467	0.15	9.20	1605	0.27
γ -Muuro-lene	11.09	1470	0.42	9.54*	1633	[0.84]
Germacrene D	11.12	1473	0.37	9.73*	1648	[0.76]
β -Selinene	11.18	1477	0.60	9.83	1656	0.56
<i>trans</i> -Muuro-la-4(15),5-diene	11.25	1482	0.27	9.78	1652	0.21
α -Selinene	11.31*	1487	0.64	9.90	1662	0.43
epi-Cubebol	11.31*	1487	[0.64]	11.95	1836	0.15
α -Muuro-lene	11.41	1494	0.28	10.00*	1670	[0.33]
γ -Cadinene	11.57*†	1507	0.85	10.36*	1699	[0.76]
Cubebol	11.57*†	1507	[0.85]	12.52	1886	0.26
β -Bisabolene	11.57*†	1507	[0.85]	10.12	1680	0.04
<i>trans</i> -Calamenene	11.71*	1518	1.39	11.18	1769	0.05
δ -Cadinene	11.71*	1518	[1.39]	10.39*	1702	[1.28]
Zonarene	11.71*	1518	[1.39]	10.36*	1699	[0.76]
<i>trans</i> -Cadina-1,4-diene	11.81	1525	0.08	10.62	1722	0.10
α -Cadinene	11.88	1531	0.07	10.75	1732	0.06
α -Calacorene	11.92	1534	0.04	12.06	1846	0.06
Isocaryophyllene epoxide B	12.02	1542	0.03	12.12	1851	0.02
α -Elemol	12.07*	1546	0.29	14.00	2024	0.12
Germacrene B	12.07*	1546	[0.29]	11.11	1763	0.17
Elemicin	12.18	1555	0.03	15.44*	2164	0.07
Palustrol	12.23	1559	0.03	12.24	1862	0.03
Unknown [m/z 152, 109 (61), 43 (21), 137 (16), 151 (16)... 222 (6)]	12.28	1563	0.09			
Germacrene D-4-ol	12.37	1570	0.07	13.67	1992	0.10
Caryophyllene oxide	12.40*	1572	0.88	12.73	1905	0.80
Caryophyllene oxide isomer	12.40*	1572	[0.88]	12.65	1898	0.04
Viridiflorol	12.54*	1583	0.28	13.95	2018	0.24

Salvial-4(14)-en-1-one	12.54*	1583	[0.28]	13.00	1930	0.03
Copaborneol	12.71	1596	0.13	14.88	2109	0.15
Unknown [m/z 161, 189 (76), 204 (66), 105 (60), 119 (46), 107 (41), 59 (38)...222 (3)]	12.83*	1606	0.48	14.27	2049	0.39
10-epi-Cubenol	12.83*	1606	[0.48]	13.64	1989	0.09
1-epi-Cubenol	13.00	1621	0.13	13.73	1998	0.12
τ -Cadinol	13.18*	1635	0.63	14.85	2106	0.55
τ -Muurolol	13.18*	1635	[0.63]	15.01	2122	0.05
α -Muurolol	13.26*	1642	0.20	15.15	2135	0.06
β -Eudesmol	13.26*	1642	[0.20]	15.35	2156	0.12
α -Eudesmol	13.30	1645	0.07	15.29	2149	0.11
α -Cadinol	13.34	1648	0.05	15.44*	2164	[0.07]
(3Z)-Caryophylla-3,8(13)-dien-5 β -ol	13.55	1666	0.08	16.77	2301	0.09
Germacra-4(15),5,10(14)-trien-1 α -ol	13.70	1678	0.01	16.06	2227	0.02
Shyobunol	13.74	1681	0.02	16.26	2248	0.08
α -Phellandrene dimer I	14.33	1732	0.01	11.87	1828	0.02
α -Phellandrene dimer II	14.96	1787	0.14	12.45	1880	0.15
α -Phellandrene dimer III	15.15	1803	0.04	13.10	1939	0.06
α -Phellandrene dimer IV	15.37	1824	0.02	13.26	1954	0.03
Unknown [m/z 43, 81 (45), 137 (39), 71 (39), 93 (33), 95 (32)...]	16.25	1904	0.02			
(3E)-Cembrene A	16.73	1950	0.31	15.56	2176	0.32
para-Camphorene	17.09	1984	0.02	15.80	2200	0.02
Cembrene C	17.20	1994	0.11	16.23	2245	0.08
Verticilla-4(20),7,11-triene	17.23	1997	0.08	16.34	2257	0.13
Cembrenol	18.53	2129	0.15	20.07	2673	0.16
Serratol	18.67*	2143	1.27	19.59	2616	0.90
Incensole	18.67*	2143	[1.27]	20.61	2738	0.44
Total identified		96.58%			95.33%	
Total reported		97.10%			95.93%	

*: 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