

Date : May 22, 2019

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 19E21-PTH03-1-SCC

Customer identification : Myrrh - Ethiopia - M40108812R

Type : Essential oil

Source : *Commiphora myrrha*

Customer : Plant Therapy

ANALYSIS

Method: PC-PA-014-17J19 - 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 : May 22, 2019

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Yellow viscous liquid

Refractive index: 1.5273 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
α -Thujene	tr	tr	Monoterpene
α -Pinene	0.01	0.01	Monoterpene
β -Pinene	0.01*	tr	Monoterpene
Sabinene	[0.01]*	tr	Monoterpene
Myrcene	0.01	0.01	Monoterpene
para-Cymene	0.01		Monoterpene
Limonene	0.01	0.01	Monoterpene
(E)- β -Ocimene	0.04	0.04	Monoterpene
δ -Elemene isomer	0.01	0.03	Sesquiterpene
δ -Elemene	0.70	0.69	Sesquiterpene
α -Cubebene	0.03	0.02	Sesquiterpene
α -Ylangene	0.01	0.04	Sesquiterpene
α -Copaene	0.08	0.08	Sesquiterpene
β -Bourbonene	0.25	0.29	Sesquiterpene
1,5-diepi- β -Bourbonene	0.11*	0.03	Sesquiterpene
cis- β -Elemene	[0.11]*	0.09	Sesquiterpene
β -Elemene	3.18	3.64*	Sesquiterpene
β -Caryophyllene	0.41*	[3.64]*	Sesquiterpene
cis- α -Bergamotene	[0.41]*	0.09	Sesquiterpene
β -Copaene	0.09	0.08	Sesquiterpene
γ -Elemene	0.50	0.52	Sesquiterpene
Isogermacrene D	0.07	0.10	Sesquiterpene
α -Humulene	0.19	0.19	Sesquiterpene
4,5-diepi-Aristolochene	0.03	0.11*	Sesquiterpene
Unknown	0.03	[0.11]*	Sesquiterpene
trans-Cadina-1(6),4-diene	0.04	0.03	Sesquiterpene
γ -Muurolene	0.11	0.11	Sesquiterpene
Germacrene D	1.13	1.18	Sesquiterpene
β -Selinene	0.35	0.36	Sesquiterpene
δ -Selinene	0.08	0.04	Sesquiterpene
Bicyclogermacrene	0.40*	0.05	Sesquiterpene
α -Selinene	[0.40]*	0.43*	Sesquiterpene
Curzerene	17.59	18.67	Sesquiterpenic ether
δ -Amorphene	0.29*	[0.43]*	Sesquiterpene
ϵ -Amorphene	[0.29]*	0.06	Sesquiterpene
γ -Cadinene	0.25*	0.16	Sesquiterpene
(Z)- γ -Bisabolene	[0.25]*	0.03	Sesquiterpene
δ -Cadinene	0.18	0.15	Sesquiterpene
Unknown	0.10*	0.10	Sesquiterpene
Selina-3,7(11)-diene	[0.10]*	0.01	Sesquiterpene
Germacrene B	2.57	2.71	Sesquiterpene
Furanoesma-1,4-diene	0.57	1.78*	Sesquiterpenic ether
Viridiflorol	0.05	0.07	Sesquiterpenic alcohol
β -Elemenone	0.40	0.20	Sesquiterpenic ketone
Selin-6-en-4 α -ol	0.16	0.16	Sesquiterpenic alcohol
Furanoesma-1,3-diene	33.53*	37.31	Sesquiterpenic ether
γ -Eudesmol	[33.53]*	6.71*	Sesquiterpenic alcohol
Lindrestrene	10.47	9.69	Sesquiterpenic ether

τ-Muurolol	0.68*	0.63	Sesquiterpenic alcohol
τ-Cadinol	[0.68]*	[6.71]*	Sesquiterpenic alcohol
α-Eudesmol	0.17	0.13	Sesquiterpenic alcohol
Furanodiene	0.52		Sesquiterpenic ether
Isofuranogermacrene	0.46		Sesquiterpenic ether
α-Elemyl acetate	1.53	[1.78]*	Sesquiterpenic ester
Methoxyfuranodiene analog	8.66*	[6.71]*	Sesquiterpenic ether
Germacrene	[8.66]*	0.65	Sesquiterpenic ketone
2-Methoxyfuranodiene	4.66	4.95	Sesquiterpenic ether
2-Acetoxyfuranodiene	0.52	0.38	Sesquiterpenic ester
Unknown	0.20	0.21	Unknown
Total identified	91.20%	92.78%	

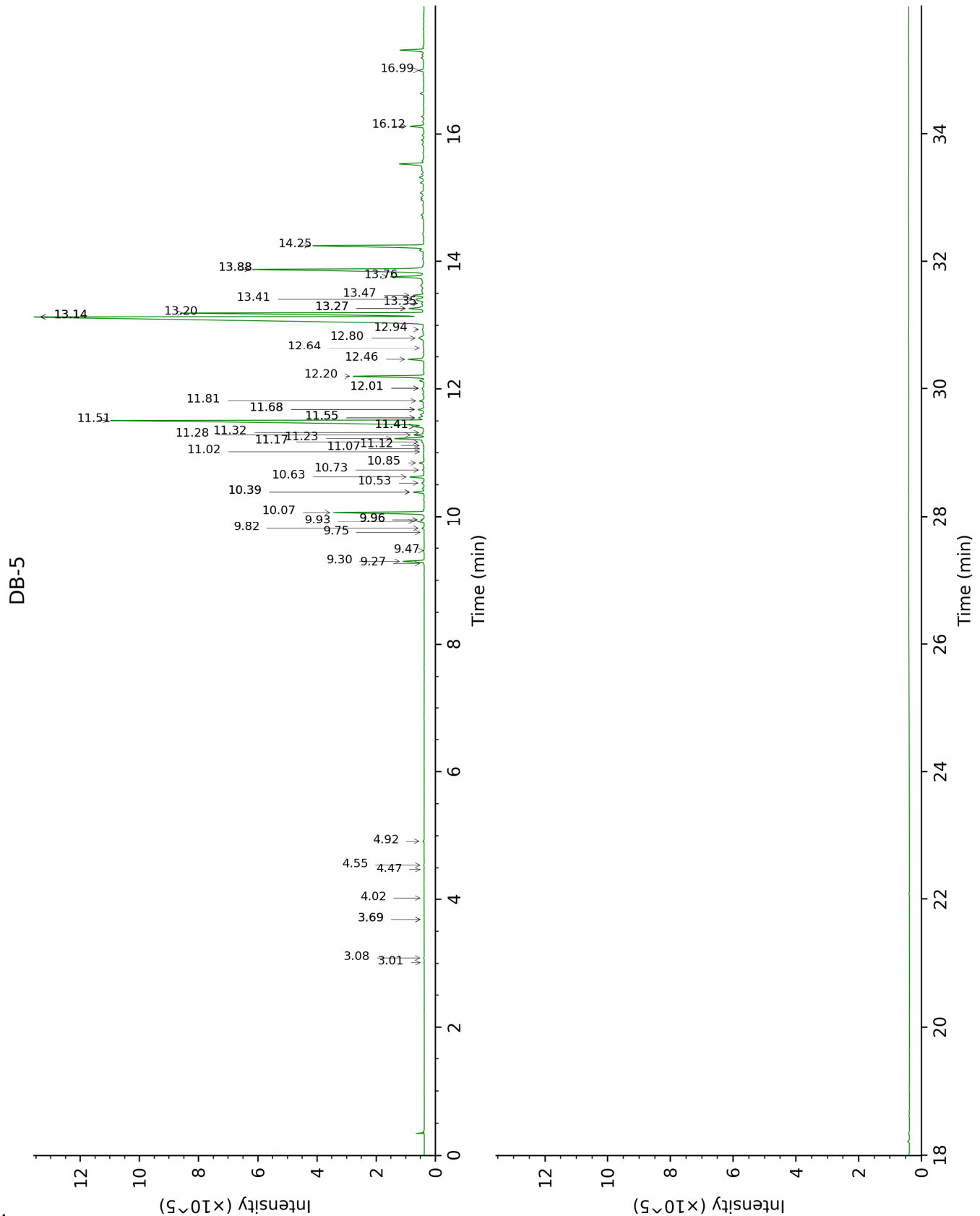
*: Two or more compounds are coeluting on this column

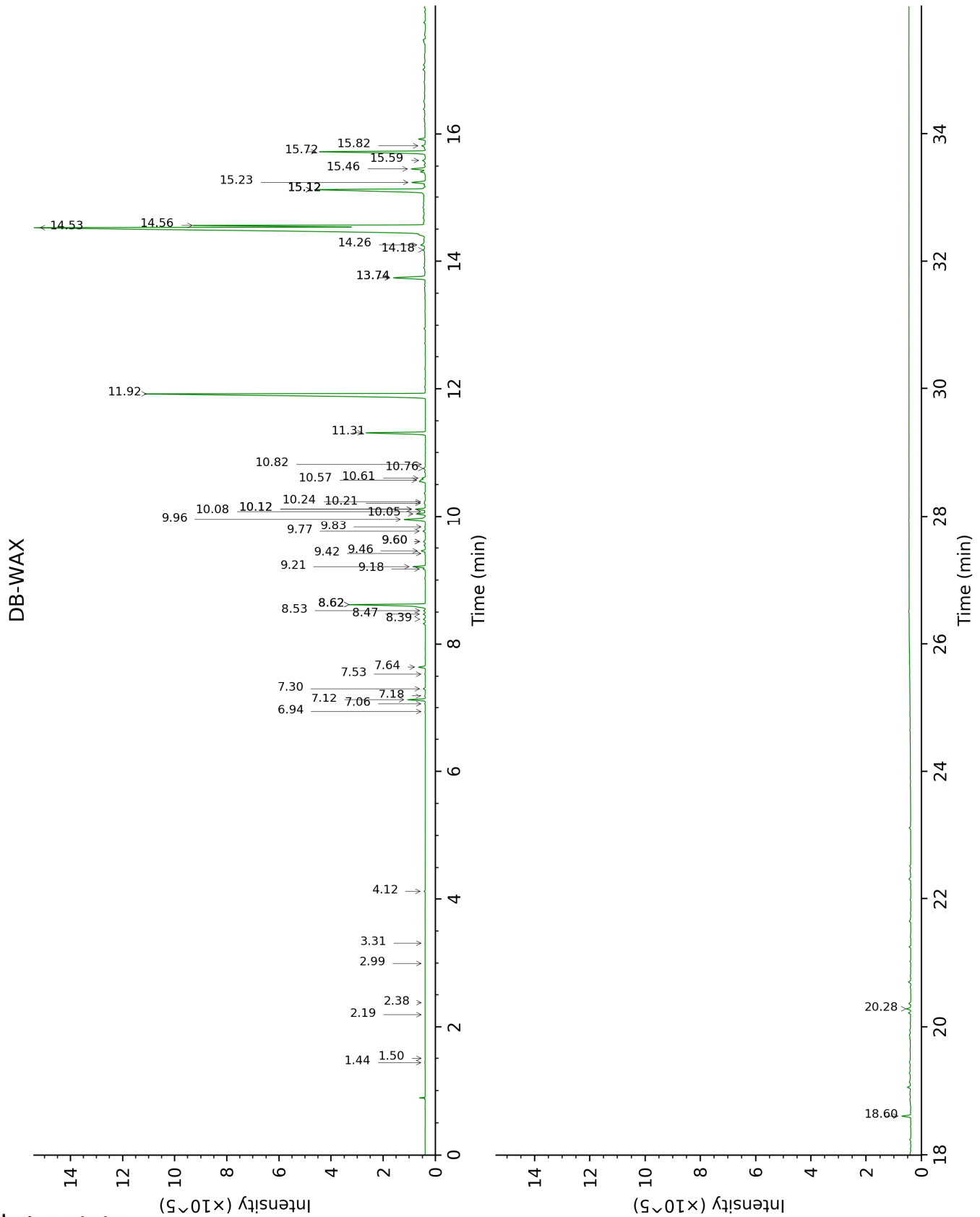
[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

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

Note: no correction factor was applied

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FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
α -Thujene	3.01	925	tr	1.50	998	tr
α -Pinene	3.08	930	0.01	1.44	990	0.01
β -Pinene	3.68*	970	0.01	2.19	1065	tr
Sabinene	3.68*	970	[0.01]	2.38	1083	tr
Myrcene	4.02	992	0.01	2.99	1132	0.01
para-Cymene	4.47	1020	0.01			
Limonene	4.55	1025	0.01	3.31	1156	0.01
(E)- β -Ocimene	4.92	1049	0.04	4.12	1216	0.04
δ -Elemene isomer	9.27	1334	0.01	7.06	1427	0.03
δ -Elemene	9.30	1337	0.70	7.12	1431	0.69
α -Cubebene	9.47	1349	0.03	6.94	1418	0.02
α -Ylangene	9.75	1369	0.01	7.18	1436	0.04
α -Copaene	9.82	1373	0.08	7.30	1445	0.08
β -Bourbonene	9.92	1381	0.25	7.64	1470	0.29
1,5-diepi- β -Bourbonene	9.96*	1383	0.11	7.53	1462	0.03
<i>cis</i> - β -Elemene	9.96*	1383	[0.11]	8.47	1532	0.09
β -Elemene	10.07	1392	3.18	8.62*	1544	3.64
β -Caryophyllene	10.39*	1415	0.41	8.62*	1544	[3.64]
<i>cis</i> - α -Bergamotene	10.39*	1415	[0.41]	8.39	1526	0.09
β -Copaene	10.53	1425	0.09	8.52	1537	0.08
γ -Elemene	10.63	1432	0.50	9.21	1589	0.52
Isogermacrene D	10.74	1440	0.07	9.18	1587	0.10
α -Humulene	10.84	1449	0.19	9.46	1609	0.19
4,5-diepi-Aristolochene	11.02	1462	0.03	9.60*	1621	0.11
Unknown [m/z 119, 91 (85), 93 (77), 105 (76), 79 (61), 134 (60), 94 (49), 204 (46)]	11.07	1466	0.03	9.60*	1621	[0.11]
<i>trans</i> -Cadina-1(6),4-diene	11.12	1469	0.04	9.42	1606	0.03
γ -Muurolene	11.17	1473	0.11	9.77	1634	0.11
Germacrene D	11.23	1477	1.13	9.96	1650	1.18
β -Selinene	11.28	1482	0.35	10.05	1656	0.36
δ -Selinene	11.32	1484	0.08	9.83	1639	0.04
Bicyclogermacrene	11.41*	1491	0.40	10.24	1672	0.05
α -Selinene	11.41*	1491	[0.40]	10.12*	1662	0.43
Curzerene	11.51	1498	17.59	11.92	1814	18.67
δ -Amorphene	11.55*	1501	0.29	10.12*	1662	[0.43]
ϵ -Amorphene	11.55*	1501	[0.29]	10.21	1670	0.06
γ -Cadinene	11.68*	1511	0.25	10.58	1699	0.16
(Z)- γ -Bisabolene	11.68*	1511	[0.25]	10.08	1659	0.03
δ -Cadinene	11.81	1522	0.18	10.60	1702	0.15
Unknown [m/z 189, 204 (92), 161 (65), 133 (51), 105 (51), 91 (51), 119 (45)]	12.01*	1538	0.10	10.76	1714	0.10

Selina-3,7(11)-diene	12.01*	1538	[0.10]	10.82	1720	0.01
Germacrene B	12.20	1552	2.57	11.31	1762	2.71
Furanoedesma-1,4-diene	12.46	1573	0.57	13.74*	1978	1.78
Viridiflorol	12.64	1587	0.05	14.18	2019	0.07
β-Elemenone	12.80	1600	0.40	14.26	2026	0.20
Selin-6-en-4α-ol	12.94	1611	0.16	15.82	2179	0.16
Furanoedesma-1,3-diene	13.14*	1627	33.53	14.53	2052	37.31
γ-Eudesmol	13.14*	1627	[33.53]	15.12*	2110	6.71
Lindstrene	13.20	1632	10.47	14.56	2055	9.69
τ-Muurolol	13.27*	1638	0.68	15.23	2121	0.63
τ-Cadinol	13.27*	1638	[0.68]	15.12*	2110	[6.71]
α-Eudesmol	13.35	1645	0.17	15.59	2156	0.13
Furanodiene	13.41	1650	0.52			
Isofuranogermacrene	13.47	1655	0.46			
α-Elemyl acetate	13.76	1679	1.53	13.74*	1978	[1.78]
Methoxyfuranodiene analog	13.88*	1689	8.66	15.12*	2110	[6.71]
Germacrone	13.88*	1689	[8.66]	15.46	2143	0.65
2-Methoxyfuranodiene	14.25	1720	4.66	15.72	2170	4.95
2-Acetoxyfuranodiene	16.12	1886	0.52	18.60	2477	0.38
Unknown [m/z 197, 108 (83), 212 (50), 43 (42), 169 (38), 183 (31), 155 (30), 79 (26), 105 (26)]	16.99	1968	0.20	20.28	2673	0.21
Total identified		91.20%			92.78%	
Total reported		91.43%			93.09%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

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