

## GC/MS BATCH NUMBER: H20106

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**ESSENTIAL OIL:** HELICHRYSUM ITALICUM  
**BOTANICAL NAME:** HELICHRYSUM ITALICUM  
**ORIGIN:** BOSNIA AND HERZEGOVINA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF HELICHRYSUM ITALICUM OIL	%
A-PINENE	21.2
NERYL ACETATE	13.1
ITALIDIONE II ISOMER I + ITALIDIONE II ISOMER II	7.2
β-SELINENE	5.4
β-CARYOPHYLLENE	5.4
α-SELINENE	3.7
ITALICENE	3.4
α-CURCUMENE	2.7
LIMONENE	2.4
ITALIDIONE I	2.2
7-epi-α-SELINENE + ZONARENE	1.2

**Date :** March 23, 2018

**CERTIFICATE OF ANALYSIS - GC PROFILING**

**SAMPLE IDENTIFICATION**

**Internal code :** 18C22-PTH5-1-CC

**Customer identification :** Helichrysum Italicum - Bosnia and Herzegovina - H2010678R

**Type :** Essential oil

**Source :** *Helichrysum italicum*

**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 :** Sarah-Eve Tremblay, M. Sc. A., Chimiste

**Analysis date :** March 22, 2018

Checked and approved by :



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

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*PHYSICOCHEMICAL DATA*

**Physical aspect:** Faintly yellow liquid

**Refractive index:**  $1.4768 \pm 0.0003$  (20 °C)

*CONCLUSION*

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

## ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
2-Methyl-3-buten-2-ol	tr	tr	Aliphatic alcohol
Isovaleral	tr	tr	Aliphatic aldehyde
2-Methylbutyral	tr	0.01	Aliphatic aldehyde
3-Pentanone	0.02	0.02*	Aliphatic ketone
2-Ethylfuran	tr	tr	Furan
2-Methylbutanol	tr	0.01*	Aliphatic alcohol
2-Methyl-3-pentanone	0.05	0.05	Aliphatic ketone
Unknown	0.01	0.01	Unknown
Unknown	0.02	[0.02]*	Unknown
Hexanal	tr	0.01	Aliphatic aldehyde
2-Methyl-2-heptene	0.07	0.07	Alkene
4-Methyl-3-hexanone	0.11	0.11	Aliphatic ketone
Hexanol	tr	0.01	Aliphatic alcohol
Isoamyl acetate	0.01	0.01	Aliphatic ester
Bornylene	0.04*	0.02	Monoterpene
Nonane	[0.04]*	0.02	Alkane
Isobutyl isobutyrate	tr	tr	Aliphatic ester
Hashishene	0.01	21.49*	Monoterpene
$\alpha$ -Thujene	0.01	0.02	Monoterpene
$\alpha$ -Pinene	21.21	[21.49]*	Monoterpene
$\alpha$ -Fenchene	0.40*	0.27	Monoterpene
Camphene	[0.40]*	0.14	Monoterpene
Thuja-2,4(10)-diene	0.02	0.02*	Monoterpene
Sabinene	0.40*	[0.02]*	Monoterpene
$\beta$ -Pinene	[0.40]*	0.40	Monoterpene
6-Methyl-5-hepten-2-one	0.01	0.01	Aliphatic ketone
<i>trans</i> -Dehydroxylinool oxide	0.06*	[0.01]*	Monoterpenic ether
2-Pentylfuran	[0.06]*	0.01*	Furan
Myrcene	[0.06]*	0.05	Monoterpene
6-Methyl-5-hepten-2-ol	0.02	0.11*	Aliphatic alcohol
Unknown	0.02	0.03*	Monoterpene
2-Carene	0.01	0.01	Monoterpene
$\alpha$ -Phellandrene	0.05*	[0.03]*	Monoterpene
Isobutyl 2-methylbutyrate	[0.05]*	0.05	Aliphatic ester
$\Delta^3$ -Carene	tr	tr	Monoterpene
(3Z)-Hexenyl acetate	0.01	0.01	Aliphatic ester
$\alpha$ -Terpinene	0.14	0.15	Monoterpene
para-Methylanisole	0.01	0.02*	Simple phenolic
para-Cymene	0.19	0.20	Monoterpene
Limonene	2.71*	2.40	Monoterpene
1,8-Cineole	[2.71]*	0.39*	Monoterpenic ether
$\beta$ -Phellandrene	[2.71]*	[0.39]*	Monoterpene
(Z)- $\beta$ -Ocimene	0.01	0.01	Monoterpene
(E)- $\beta$ -Ocimene	0.03	0.02	Monoterpene
Isobutyl angelate	0.29	0.31	Aliphatic ester
$\gamma$ -Terpinene	0.36	0.37	Monoterpene
Octanol	0.01	0.01	Aliphatic alcohol
Terpinolene	0.14	0.14	Monoterpene

para-Cymenene	0.01	[0.02]*	Monoterpene
2-Nonanone	0.05	0.04*	Aliphatic ketone
2,4-Dimethylheptane-3,5-dione	0.04*	0.02	$\beta$ -Diketone
Isobutyl tiglate	[0.04]*	0.01	Aliphatic ester
Linalool	0.57	0.57	Monoterpenic alcohol
2-Methylbutyl 2-methylbutyrate	0.17*	0.09	Aliphatic ester
Nonanal	[0.17]*	0.06	Aliphatic aldehyde
Isoamyl isovalerate	0.02*	tr	Aliphatic ester
Verbenol analog?	[0.02]*	0.90*	Monoterpenic alcohol
endo-Fenchol	0.05	0.05	Monoterpenic alcohol
4-Hydroxy-4-methylcyclohex-2-enone	tr	0.01	Aliphatic alcohol
trans-Pinocarveol	0.06	0.05	Monoterpenic alcohol
trans-Verbenol	0.03	1.72*	Monoterpenic alcohol
Isoamyl angelate	0.02	[0.04]*	Aliphatic ester
para-Vinylanisole	0.04	0.32*	Simple phenolic
Nerol oxide	0.03	0.02*	Aliphatic ether
Pinocarvone	0.85*	0.48*	Monoterpenic ketone
2-Methylbutyl angelate	[0.85]*	0.83	Aliphatic ester
Borneol	0.06	11.16*	Monoterpenic alcohol
Unknown	0.02	0.03	Aliphatic ester
Terpinen-4-ol	0.22*	0.29*	Monoterpenic alcohol
Nonanol	[0.22]*	[1.72]*	Aliphatic alcohol
4,6-Dimethyloctane-3,5-dione epimer I	0.16	[0.29]*	$\beta$ -Diketone
4,6-Dimethyloctane-3,5-dione epimer II	0.19	[0.29]*	$\beta$ -Diketone
$\alpha$ -Terpineol	0.24	[11.16]*	Monoterpenic alcohol
2-Methylbutyl tiglate	0.03	[0.11]*	Aliphatic ester
Myrtenol	0.03	0.05	Monoterpenic alcohol
Unknown	0.02	0.59*	Unknown
Decanal	0.05*	0.03	Aliphatic aldehyde
Dodecane	[0.05]*	[0.01]*	Alkane
Nerol	0.47*	0.29	Monoterpenic alcohol
Unknown	[0.47]*		$\beta$ -Diketone
Hexyl 2-methylbutyrate?	0.03		Aliphatic ester
Hexyl isovalerate	0.01	0.01	Aliphatic ester
Isoamyl hexanoate	0.03*	[0.02]*	Aliphatic ester
3-Methylpentyl angelate	[0.03]*	0.02	Aliphatic ester
Unknown	0.08	[0.11]*	Aliphatic ester
Unknown	0.04*	0.08*	Aliphatic ester
Linalyl acetate	[0.04]*	tr	Monoterpenic ester
(3Z)-Hexenyl angelate	0.02*	0.07*	Aliphatic ester
Neryl formate	[0.02]*	[1.72]*	Monoterpenic ester
Hexyl angelate	0.36	[0.48]*	Aliphatic ester
2-Undecanone	0.04	0.05	Aliphatic ketone
Tridecane	0.05		Alkane
Myrtenyl acetate	0.01	0.17*	Monoterpenic ester
Hexyl tiglate	0.01	0.01	Aliphatic ester
Bicycloelemene	0.02	0.02	Sesquiterpene
$\alpha$ -Terpinyl acetate	0.12	0.15	Monoterpenic ester
Cyclosativene I	0.07	[0.11]*	Sesquiterpene

Cyclosativene II	0.28	0.43	Sesquiterpene
$\alpha$ -Ylangene	15.25*	[0.08]*	Sesquiterpene
Neryl acetate	[15.25]*	13.11*	Monoterpenic ester
$\alpha$ -Copaene	[15.25]*	1.53*	Sesquiterpene
Italicene isomer	[15.25]*	0.91	Sesquiterpene
7-Cubebene epimer?	[15.25]*	[1.53]*	Aliphatic alcohol
Geranyl acetate	0.26	0.35	Monoterpenic ester
Hexyl hexanoate	0.04	0.04	Aliphatic ester
$\alpha$ -Funebrene	0.14	0.17	Sesquiterpene
Isoitalicene	0.14	3.40*	Sesquiterpene
Italicene	3.35	[3.40]*	Sesquiterpene
Tetradecane	0.09*	0.02	Alkane
$\alpha$ -Gurjunene	[0.09]*	0.03	Sesquiterpene
Isocaryophyllene	0.09	[0.07]*	Sesquiterpene
$\beta$ -Caryophyllene	5.32*	5.42*	Sesquiterpene
<i>cis</i> - $\alpha$ -Bergamotene	[5.32]*	[0.90]*	Sesquiterpene
$\beta$ -Copaene	0.05	[0.90]*	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	0.87	[5.42]*	Sesquiterpene
Italidione I	2.34*		$\beta$ -Diketone
6,9-Guaiadiene	[2.34]*	0.07	Sesquiterpene
Unknown	[2.34]*	0.02	Sesquiterpene
Cadina-4,11-diene	[2.34]*	0.07	Sesquiterpene
$\alpha$ -Humulene	0.31	0.33	Sesquiterpene
Neryl propionate	1.28*	[0.59]*	Monoterpenic ester
( <i>E</i> )- $\beta$ -Farnesene	[1.28]*	0.75	Sesquiterpene
allo-Aromadendrene	[1.28]*	0.03	Sesquiterpene
$\alpha$ -Acoradiene	[1.28]*	0.08	Sesquiterpene
$\beta$ -Acoradiene	[1.28]	[0.32]*	Sesquiterpene
4,5-diepi-Aristolochene	0.36	[1.72]*	Sesquiterpene
Unknown	0.10	[1.72]*	Sesquiterpene
Selina-4,11-diene	1.48	[1.72]*	Sesquiterpene
$\alpha$ -Amorphene	0.19	[0.17]*	Sesquiterpene
Italidione II isomer I	21.20*	7.20*	$\beta$ -Diketone
$\gamma$ -Curcumene	[21.20]*	[11.16]*	Sesquiterpene
$\alpha$ -Curcumene	[21.20]*	2.68	Sesquiterpene
$\beta$ -Selinene	[21.20]*	5.72*	Sesquiterpene
Valencene	[21.20]*	0.24	Sesquiterpene
Italidione II isomer II	[21.20]*	[7.20]*	$\beta$ -Diketone
$\alpha$ -Selinene	5.99*	3.73	Sesquiterpene
Eudesma-2,4(15),11-triene	[5.99]*	0.01	Sesquiterpene
Italidione II analog	[5.99]	1.38*	$\beta$ -Diketone
$\delta$ -Amorphene	0.29	[5.72]*	Sesquiterpene
10-epi-Italicene ether	0.21*	0.04	Sesquiterpenic ether
$\gamma$ -Cadinene	[0.21]*	0.41*	Sesquiterpene
$\beta$ -Curcumene	[0.21]*	[13.11]*	Sesquiterpene
$\beta$ -Bisabolene	1.88*	[13.11]*	Sesquiterpene
7-epi- $\alpha$ -Selinene	[1.88]*	1.16*	Sesquiterpene
$\delta$ -Cadinene	0.94*	[1.16]*	Sesquiterpene
Sesquicineole	[0.94]*	[0.41]*	Sesquiterpenic ether
<i>trans</i> -Calamenene	[0.94]*	0.02	Sesquiterpene
Zonarene	[0.94]*	[1.16]*	Sesquiterpene
<i>cis</i> -Calamenene?	0.26*	tr	Sesquiterpene

<i>trans</i> -Cadina-1,4-diene	[0.26]*	0.04*	Sesquiterpene
( <i>E</i> )- $\gamma$ -Bisabolene	[0.26]*	[1.16]*	Sesquiterpene
Italicene ether	[0.26]*	0.10	Sesquiterpenic ether
Phenylethyl angelate?	0.06*	0.03	Phenolic ester
Selina-3,7(11)-diene	[0.06]*	[0.04]*	Sesquiterpene
( <i>E</i> )- $\alpha$ -Bisabolene	0.16	0.11	Sesquiterpene
Isocaryophyllene epoxide B	0.11	0.12	Sesquiterpenic ether
( <i>E</i> )-Nerolidol	0.19*	0.14*	Sesquiterpenic alcohol
$\beta$ -Calacorene	[0.19]*		Sesquiterpene
Italidione III isomer I	0.54	[1.38]*	$\beta$ -Diketone
Italidione III isomer II	0.48	[1.38]*	$\beta$ -Diketone
Italidione III isomer III	0.34		$\beta$ -Diketone
Guaiol	0.18	0.18	Sesquiterpenic alcohol
Eudesm-5-en-11-ol	0.23	0.28	Sesquiterpenic alcohol
Copaborneol	0.30	0.27*	Sesquiterpenic alcohol
Unknown	0.11	0.11	Oxygenated sesquiterpene
Unknown	0.14	0.13	Unknown
Neryl angelate?	0.01		Monoterpenic ester
1- <i>epi</i> -Cubenol	0.07*	[0.14]*	Sesquiterpenic alcohol
Caryophylladienol I	[0.07]*	0.03	Sesquiterpenic alcohol
$\gamma$ -Eudesmol	0.14*	[0.27]*	Sesquiterpenic alcohol
Unknown	[0.14]*	0.04	Oxygenated sesquiterpene
Caryophylladienol II	[0.14]*	0.02	Sesquiterpenic alcohol
$\tau$ -Cadinol	0.11*	0.04	Sesquiterpenic alcohol
$\tau$ -Muurolol	[0.11]*	0.03	Sesquiterpenic alcohol
$\alpha$ -Muurolol	0.09*	0.03	Sesquiterpenic alcohol
$\beta$ -Eudesmol	[0.09]*	0.03	Sesquiterpenic alcohol
Selin-11-en-4 $\alpha$ -ol	0.25*	0.18	Sesquiterpenic alcohol
$\alpha$ -Eudesmol	[0.25]*	0.14	Sesquiterpenic alcohol
Bulnesol	0.02	0.03	Sesquiterpenic alcohol
$\beta$ -Bisabolol	0.15	0.14	Sesquiterpenic alcohol
<i>epi</i> - $\alpha$ -Bisabolol	0.01	0.03	Sesquiterpenic alcohol
$\alpha$ -Bisabolol	0.04	0.06	Sesquiterpenic alcohol
Neryl 4-methylvalerate?	0.03	0.02	Monoterpenic ester
Unknown	0.05	0.07	Unknown
Geranyl 4-methylvalerate?	0.09	0.11	Monoterpenic ester
Unknown	0.02		Oxygenated sesquiterpene
Unknown	0.01	0.02	Oxygenated sesquiterpene
Unknown	0.03		Oxygenated sesquiterpene
Unknown	0.02	0.04	Oxygenated sesquiterpene
Unknown	0.06	0.01	Oxygenated sesquiterpene
Unknown	0.04	0.05	Oxygenated sesquiterpene
Unknown	0.05	0.04	Oxygenated sesquiterpene
Unknown	0.22	0.22	Oxygenated sesquiterpene
Unknown	0.15		Unknown
Unknown		0.15	Sesquiterpene
<b>Total identified</b>	<b>96.81%</b>	<b>96.70%</b>	

\*: Two or more compounds are coeluting on this column

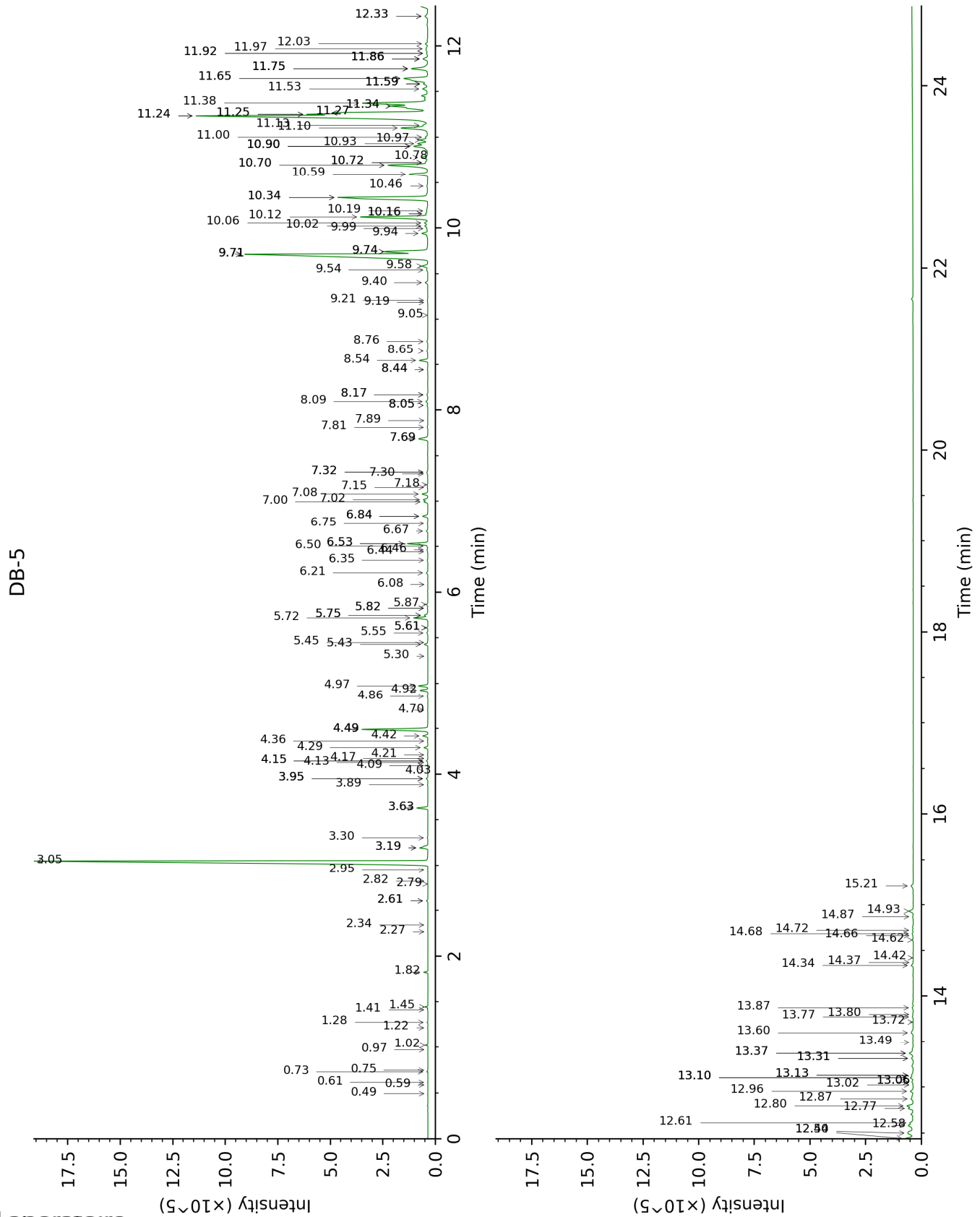
[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

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

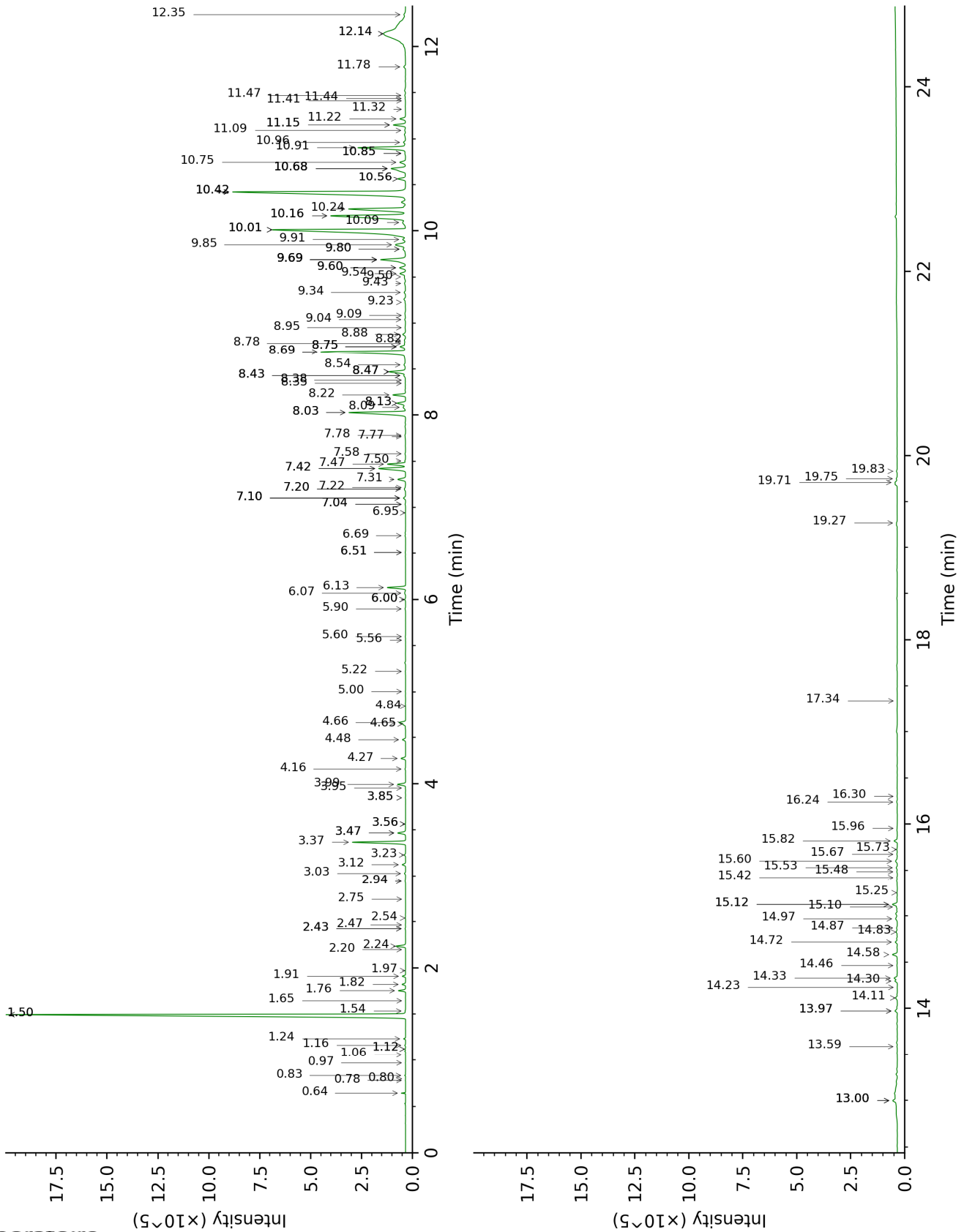
Note: no correction factor was applied

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DB-WAX



FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
2-Methyl-3-buten-2-ol	0.49	606	tr	1.65	1014	tr
Isovaleral	0.59	639	tr	0.80	886	tr
2-Methylbutyral	0.62	649	tr	0.78	879	0.01
3-Pentanone	0.73	689	0.02	1.12*	943	0.02
2-Ethylfuran	0.75	695	tr	0.97	919	tr
2-Methylbutanol	0.97	732	tr	3.56*	1177	0.01
2-Methyl-3-pentanone	1.02	739	0.05	1.24	960	0.05
Unknown [m/z 73, 41 (54), 87 (50), 56 (47), 54 (29), 55 (25), 100 (23)... 115? (6)]	1.22	768	0.01	1.06	933	0.01
Unknown [m/z 73, 87 (52), 41 (45), 56 (42), 100 (29)...]	1.28	776	0.02	1.12*	943	[0.02]
Hexanal	1.41	796	tr	1.97	1045	0.01
2-Methyl-2-heptene	1.45	801	0.07	0.64	833	0.07
4-Methyl-3-hexanone	1.82	833	0.11	1.91	1039	0.11
Hexanol	2.27	871	tr	5.56	1321	0.01
Isoamyl acetate	2.34	877	0.01	2.47	1092	0.01
Bornylene	2.61*	900	0.04	1.16	949	0.02
Nonane	2.61*	900	[0.04]	0.83	898	0.02
Isobutyl isobutyrate	2.79	912	tr	2.20	1066	tr
Hashishene	2.82	914	0.01	1.50*	999	21.49
α-Thujene	2.95	923	0.01	1.54	1003	0.02
α-Pinene	3.05	930	21.21	1.50*	999	[21.49]
α-Fenchene	3.19*	939	0.40	1.76	1024	0.27
Camphene	3.19*	939	[0.40]	1.82	1030	0.14
Thuja-2,4(10)-diene	3.30	947	0.02	2.43*	1088	0.02
Sabinene	3.63*	968	0.40	2.43*	1088	[0.02]
β-Pinene	3.63*	968	[0.40]	2.24	1070	0.40
6-Methyl-5-hepten-2-one	3.89	985	0.01	5.22	1296	0.01
<i>trans</i> -Dehydroxylinalool oxide	3.95*	990	0.06	3.56*	1177	[0.01]
2-Pentylfuran	3.95*	990	[0.06]	3.85*	1198	0.01
Myrcene	3.95*	990	[0.06]	3.03	1136	0.05
6-Methyl-5-hepten-2-ol	4.03	995	0.02	7.10*	1432	0.11
Unknown [m/z = 123, 43 (16), 152	4.09	999	0.02	2.94*	1129	0.03

(14), 124 (9), 137 (6)]						
2-Carene	4.13	1002	0.01	2.54	1099	0.01
α-Phellandrene	4.15*	1003	0.05	2.94*	1129	[0.03]
Isobutyl 2-methylbutyrate	4.15*	1003	[0.05]	3.23	1151	0.05
Δ3-Carene	4.17	1004	tr	2.74	1114	tr
(3Z)-Hexenyl acetate	4.21	1007	0.01	5.00	1281	0.01
α-Terpinene	4.29	1012	0.14	3.12	1143	0.15
para-Methylanisole	4.36	1016	0.01	6.51*	1388	0.02
para-Cymene	4.42	1020	0.19	4.27	1229	0.20
Limonene	4.49*	1024	2.71	3.37	1162	2.40
1,8-Cineole	4.49*	1024	[2.71]	3.47*	1170	0.39
β-Phellandrene	4.49*	1024	[2.71]	3.47*	1170	[0.39]
(Z)-β-Ocimene	4.70	1038	0.01	3.95	1206	0.01
(E)-β-Ocimene	4.86	1047	0.03	4.16	1221	0.02
Isobutyl angelate	4.92	1052	0.29	4.66	1256	0.31
γ-Terpinene	4.97	1055	0.36	3.99	1209	0.37
Octanol	5.30	1075	0.01	8.34	1525	0.01
Terpinolene	5.43	1084	0.14	4.48	1243	0.14
para-Cymenene	5.45	1085	0.01	6.51*	1388	[0.02]
2-Nonanone	5.55	1091	0.05	6.00*	1352	0.04
2,4-Dimethylheptane-3,5-dione	5.61*	1095	0.04	7.77	1481	0.02
Isobutyl tiglate	5.61*	1095	[0.04]	5.60	1323	0.01
Linalool	5.72	1102	0.57	8.22	1516	0.57
2-Methylbutyl 2-methylbutyrate	5.75*	1104	0.17	4.65	1255	0.09
Nonanal	5.75*	1104	[0.17]	6.07	1357	0.06
Isoamyl isovalerate	5.82*	1108	0.02	4.84	1269	tr
Verbenol analog?	5.82*	1108	[0.02]	8.47*	1535	0.90
endo-Fenchol	5.87	1111	0.05	8.54	1541	0.05
4-Hydroxy-4-methylcyclohex-2-enone	6.08	1125	tr	14.23	2028	0.01
trans-Pinocarveol	6.21	1133	0.06	9.43	1610	0.05
trans-Verbenol	6.35	1142	0.03	9.69*	1630	1.72
Isoamyl angelate	6.44	1148	0.02	6.00*	1352	[0.04]
para-Vinylanisole	6.46	1150	0.04	9.60*	1623	0.32
Nerol oxide	6.50	1152	0.03	7.04*	1427	0.02
Pinocarpone	6.53*	1154	0.85	8.13*	1509	0.48
2-Methylbutyl angelate	6.53*	1154	[0.85]	6.13	1361	0.83
Borneol	6.67	1163	0.06	10.01*	1657	11.16
Unknown [m/z 83, 100 (34), 55 (33), 43 (21), 84 (21)...]	6.75	1168	0.02	5.90	1345	0.03
Terpinen-4-ol	6.84*	1173	0.22	8.75*	1556	0.29

Nonanol	6.84*	1173	[0.22]	9.69*	1630	[1.72]
4,6-Dimethyloctane-3,5-dione epimer I	7.00	1184	0.16	8.75*	1556	[0.29]
4,6-Dimethyloctane-3,5-dione epimer II	7.02	1185	0.19	8.75*	1556	[0.29]
α-Terpineol	7.08	1189	0.24	10.01*	1657	[11.16]
2-Methylbutyl tiglate	7.15	1194	0.03	7.10*	1432	[0.11]
Myrtenol	7.18	1196	0.03	11.09	1746	0.05
Unknown [m/z 95, 93 (32), 121 (24), 79 (22), 91 (21), 105 (16)... 154 (2)]	7.30	1203	0.02	11.15*	1751	0.59
Decanal	7.32*	1204	0.05	7.50	1462	0.03
Dodecane	7.32*	1204	[0.05]	3.85*	1198	[0.01]
Nerol	7.69*	1229	0.47	11.22	1757	0.29
Unknown [m/z 113, 57 (55), 85 (16), 170 (16)]	7.69*	1229	[0.47]			
Hexyl 2-methylbutyrate?	7.81	1237	0.03			
Hexyl isovalerate	7.89	1242	0.01	6.94	1420	0.01
Isoamyl hexanoate	8.05*	1253	0.03	7.04*	1427	[0.02]
3-Methylpentyl angelate	8.05*	1253	[0.03]	7.58	1468	0.02
Unknown [m/z 83, 55 (29), 57 (24), 100 (21), 104 (13)...]	8.09	1256	0.08	7.10*	1432	[0.11]
Unknown [m/z 83, 55 (30), 57 (23), 100 (20), 98 (14)...]	8.17*	1261	0.04	7.20*	1440	0.08
Linalyl acetate	8.17*	1261	[0.04]	8.38	1528	tr
(3Z)-Hexenyl angelate	8.44*	1280	0.02	8.43*	1532	0.07
Neryl formate	8.44*	1280	[0.02]	9.69*	1630	[1.72]
Hexyl angelate	8.54	1286	0.36	8.13*	1509	[0.48]
2-Undecanone	8.65	1293	0.04	8.78	1559	0.05
Tridecane	8.76	1301	0.05			
Myrtenyl acetate	9.05	1321	0.01	9.80*	1640	0.17
Hexyl tiglate	9.19	1331	0.01	9.09	1582	0.01
Bicycloelemene	9.21	1332	0.02	7.22	1441	0.02
α-Terpinyl acetate	9.40	1346	0.12	9.91	1648	0.15
Cyclosativene I	9.54	1356	0.07	7.10*	1432	[0.11]
Cyclosativene II	9.58	1359	0.28	7.31	1447	0.43
α-Ylangene	9.71*†	1368	15.25	7.20*	1440	[0.08]
Neryl acetate	9.71*†	1368	[15.25]	10.42*	1690	13.11
α-Copaene	9.71*†	1368	[15.25]	7.42*	1456	1.53

Italicene isomer	9.74*†	1370	[15.25]	7.47	1459	0.91
7-Cubebene epimer?	9.74*†	1370	[15.25]	7.42*	1456	[1.53]
Geranyl acetate	9.94	1384	0.26	10.75	1717	0.35
Hexyl hexanoate	10.00	1388	0.04	9.04	1579	0.04
α-Funebrene	10.02	1390	0.14	8.08	1505	0.17
Isoitalicene	10.06	1392	0.14	8.03*	1501	3.40
Italicene	10.12	1397	3.35	8.03*	1501	[3.40]
Tetradecane	10.16*	1399	0.09	6.69	1402	0.02
α-Gurjunene	10.16*	1399	[0.09]	7.78	1482	0.03
Isocaryophyllene	10.19	1402	0.09	8.43*	1532	[0.07]
β-Caryophyllene	10.34*	1412	5.32	8.69*	1552	5.42
cis-α-Bergamotene	10.34*	1412	[5.32]	8.47*	1535	[0.90]
β-Copaene	10.46	1422	0.05	8.47*	1535	[0.90]
trans-α-Bergamotene	10.59	1432	0.87	8.69*	1552	[5.42]
Italidione I	10.70*†	1439	2.34			
6,9-Guaiadiene	10.70*†	1439	[2.34]	8.82	1562	0.07
Unknown [m/z 91, 161 (92), 105 (85), 119 (63), 133 (53), 79 (49), 204 (46)]	10.72*†	1441	[2.34]	8.95	1572	0.02
Cadina-4,11-diene	10.72*†	1441	[2.34]	9.34	1602	0.07
α-Humulene	10.78	1446	0.31	9.54	1618	0.33
Neryl propionate	10.90*†	1455	1.28	11.15*	1751	[0.59]
(E)-β-Farnesene	10.90*†	1455	[1.28]	9.85	1644	0.75
allo-Aromadendrene	10.90*†	1455	[1.28]	9.23	1593	0.03
α-Acoradiene	10.90*†	1455	[1.28]	9.50	1616	0.08
β-Acoradiene	10.93†	1457	[1.28]	9.60*	1623	[0.32]
4,5-diepi-Aristolochene	10.97	1460	0.36	9.69*	1630	[1.72]
Unknown [m/z 119, 91 (85), 93 (77), 105 (76), 79 (61), 134 (60), 94 (49), 204 (46)]	11.00	1462	0.10	9.69*	1630	[1.72]
Selina-4,11-diene	11.10	1470	1.48	9.69*	1630	[1.72]
α-Amorphene	11.13	1472	0.19	9.80*	1640	[0.17]
Italidione II isomer I	11.24*†	1479	21.20	12.14*	1836	7.20
γ-Curcumene	11.24*†	1479	[21.20]	10.01*	1657	[11.16]
ar-Curcumene	11.25*†	1481	[21.20]	10.91	1730	2.68
β-Selinene	11.25*†	1481	[21.20]	10.16*	1669	5.72
Valencene	11.27*†	1482	[21.20]	10.09	1663	0.24
Italidione II isomer II	11.27*†	1482	[21.20]	12.14*	1836	[7.20]
α-Selinene	11.34*†	1487	5.99	10.24	1675	3.73
Eudesma-2,4(15),11-triene	11.34*†	1487	[5.99]	11.32	1766	0.01
Italidione II	11.38†	1490	[5.99]	13.00*	1913	1.38

analog						
δ-Amorphene	11.53	1501	0.29	10.16*	1669	[5.72]
10-epi-Italicene ether	11.59*	1506	0.21	11.47	1778	0.04
γ-Cadinene	11.59*	1506	[0.21]	10.56*	1701	0.41
β-Curcumene	11.59*	1506	[0.21]	10.42*	1690	[13.11]
β-Bisabolene	11.65*	1510	1.88	10.42*	1690	[13.11]
7-epi-α-Selinene	11.65*	1510	[1.88]	10.68*	1711	1.16
δ-Cadinene	11.75*	1519	0.94	10.68*	1711	[1.16]
Sesquicineole	11.75*	1519	[0.94]	10.56*	1701	[0.41]
trans-Calamenene	11.75*	1519	[0.94]	11.44	1775	0.02
Zonarene	11.75*	1519	[0.94]	10.68*	1711	[1.16]
cis-Calamenene?	11.86*	1527	0.26	11.41	1773	tr
trans-Cadina-1,4-diene	11.86*	1527	[0.26]	10.85*	1725	0.04
(E)-γ-Bisabolene	11.86*	1527	[0.26]	10.68*	1711	[1.16]
Italicene ether	11.86*	1527	[0.26]	11.78	1805	0.10
Phenylethyl angelate?	11.92*	1532	0.06	14.46	2050	0.03
Selina-3,7(11)-diene	11.92*	1532	[0.06]	10.85*	1725	[0.04]
(E)-α-Bisabolene	11.97	1536	0.16	10.96	1735	0.11
Isocaryophyllene epoxide B	12.02	1540	0.11	12.35	1855	0.12
(E)-Nerolidol	12.33*	1564	0.19	13.97*	2003	0.14
β-Calacorene	12.33*	1564	[0.19]			
Italidione III isomer I	12.44	1573	0.54	13.00*	1913	[1.38]
Italidione III isomer II	12.50	1577	0.48	13.00*	1913	[1.38]
Italidione III isomer III	12.58	1584	0.34			
Guaiol	12.61	1586	0.18	14.33	2037	0.18
Eudesm-5-en-11-ol	12.77	1598	0.23	14.58	2062	0.28
Copaborneol	12.80	1601	0.30	15.12*	2115	0.27
Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)]	12.87	1607	0.11	14.72	2075	0.11
Unknown [m/z 182, 109 (58), 69 (50), 41 (42), 43 (40), 139 (31)... 235 (17), 250 (1)...]	12.96	1614	0.14	14.30	2034	0.13
Neryl angelate?	13.02	1619	0.01			
1-epi-Cubenol	13.06*	1622	0.07	13.97*	2003	[0.14]
Caryophylladienol I	13.06*	1622	[0.07]	16.24	2228	0.03
γ-Eudesmol	13.10*	1626	0.14	15.12*	2115	[0.27]
Unknown [m/z	13.10*	1626	[0.14]	14.87	2090	0.04

179, 161 (66), 119 (44), 95 (38), 105 (35)... 204 (24), 222 (1)]						
Caryophylladienol II	13.10*	1626	[0.14]	16.30	2234	0.02
τ-Cadinol	13.13*	1628	0.11	15.10	2112	0.04
τ-Muurolol	13.13*	1628	[0.11]	15.25	2128	0.03
α-Muurolol	13.31*	1643	0.09	15.42	2144	0.03
β-Eudesmol	13.31*	1643	[0.09]	15.67	2170	0.03
Selin-11-en-4α-ol	13.37*	1648	0.25	15.82	2184	0.18
α-Eudesmol	13.37*	1648	[0.25]	15.60	2162	0.14
Bulnesol	13.49	1658	0.02	15.48	2151	0.03
β-Bisabolol	13.60	1667	0.15	14.97	2099	0.14
epi-α-Bisabolol	13.72	1676	0.01	15.73	2175	0.03
α-Bisabolol	13.77	1681	0.04	15.53	2155	0.06
Neryl 4-methylvalerate?	13.80	1683	0.03	13.59	1967	0.02
Unknown [m/z 196, 69 (62), 109 (58), 41 (54), 139 (41)... 249 (21)...]	13.87	1689	0.05	14.83	2085	0.07
Geranyl 4-methylvalerate?	14.34	1729	0.09	14.11	2017	0.11
Unknown [m/z 43, 69 (32), 198 (29), 41 (27), 93 (26)... 202 (20)...]	14.37	1732	0.02			
Unknown [m/z 82, 125 (40), 41 (35), 69 (31), 67 (27)... 236? (t)]	14.42	1736	0.01	15.96	2198	0.02
Unknown [m/z 136, 121 (74), 135 (55), 218 (36), 148 (33), 40 (42)... 236? (1)]	14.62	1753	0.03			
Unknown [m/z 109, 138 (71), 82 (42), 123 (41), 127 (38)...]	14.66	1757	0.02	19.27	2561	0.04
Unknown [m/z 96, 41 (29), 178 (28), 43 (27)... 236 (2)]	14.68	1759	0.06	17.34	2344	0.01
Unknown [m/z 109, 127 (46), 138 (45), 82 (34), 81 (31)... 236? (t)]	14.72	1762	0.04	19.75	2617	0.05
Unknown [m/z 109, 138 (75), 123 (45), 127 (42), 81 (30)...]	14.87	1775	0.05	19.83	2627	0.04



Unknown [m/z 98, 82 (77), 83 (42), 137 (37), 41 (28)... 238 (1)]	14.93	1780	0.22	19.71	2612	0.22
Unknown [m/z 43, 82 (69), 41 (66), 93 (62), 96 (55), 55 (49), 67 (45), 154 (44)...]	15.21	1804	0.15			
Unknown [m/z 41, 69 (90), 79 (78), 93 (72), 91 (70)...204]				8.88	1566	0.15
<b>Total identified</b>		<b>96.81%</b>			<b>96.70%</b>	
<b>Total reported</b>		<b>97.99%</b>			<b>97.52%</b>	

\*: Two or more compounds are coeluting on this column

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