Date : July 31, 2020

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 20G30-PTH46
Customer identification : Ginger Root co2 se - Nigeria / Germany - G40110204R
Type : CO2 extract
Source : *Zingiber officinale*
Customer : Plant Therapy

Analysis

Method: Dilution of a known amount with an appropriate solvent, and addition of a methyl octanoate internal standard for quantitation. Application of a correction factor[1]. Analysis with 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 : July 31, 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

Reference

(1) Cachet, T.; Brevard, H.; Chaintreau, A.; Demyttenaere, J.; French, L.; Gassenmeier, K.; Joulain, D.; Koenig, T.; Leijs, H.; Liddle, P.; et al. IOFI Recommended Practice for the Use of Predicted Relative-Response Factors for the Rapid Quantification of Volatile Flavouring *Compounds by GC-FID. Flavour Fragr. J. 2016, 31 (3), 191–194.*

Laboratoire PhytoChemia
628 Boulevard du Saguenay Ouest, Saguenay (Qc) G7J 1H4 | www.phytochemia.com

PHYSICOCHEMICAL DATA

Physical aspect: Brown liquid
Refractive index: 1.5057 ± 0.0003 (20 °C; method PC-MAT-016)

CONCLUSION

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

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ANALYSIS SUMMARY

Identification	(mg/g)	% of total volatiles	Classe
Hexanal	14.09	1.84	Aliphatic aldehyde
2-Heptanone	0.18	0.02	Aliphatic ketone
2-Heptanol	0.57	0.08	Aliphatic alcohol
Tricyclene	0.30	0.04	Monoterpene
α-Pinene	3.76	0.49	Monoterpene
Camphene	10.66	1.39	Monoterpene
α-Fenchene	0.09	0.01	Monoterpene
β-Pinene	0.53	0.07	Monoterpene
Sabinene	0.15	0.02	Monoterpene
6-Methyl-5-hepten-2-one	0.51	0.07	Aliphatic ketone
Myrcene	2.15	0.28	Monoterpene
α-Phellandrene	0.60	0.08	Monoterpene
Pseudolimonene	0.05	0.01	Monoterpene
Octanal	4.24	0.55	Aliphatic aldehyde
para-Cymene	0.17	0.02	Monoterpene
Limonene	2.90	0.38	Monoterpene
Unknown	0.16	0.02	Unknown
β-Phellandrene	10.43	1.36	Monoterpene
1,8-Cineole	8.36	1.09	Monoterpenic ether
2-Heptyl acetate	0.07	0.01	Aliphatic ester
γ-Terpinene	0.08	0.01	Monoterpene
Terpinolene	0.69	0.09	Monoterpene
2-Nonanone	0.40	0.05	Aliphatic ketone
Unknown	0.64	0.08	Oxygenated monoterpene
Rosefuran	0.76	0.10	Monoterpenic ether
Linalool	1.71	0.22	Monoterpenic alcohol
2-Nonanol	0.38	0.05	Aliphatic alcohol
(*E*)-4,8-Dimethylnona-1,3,7-triene	0.21	0.03	Terpene derivative
trans-Pinene hydrate	0.35	0.05	Monoterpenic alcohol
Unknown	0.15	0.02	Unknown
Camphor	0.61	0.08	Monoterpenic ketone
Camphene hydrate	0.36	0.05	Monoterpenic alcohol
exo-Isocitral	0.24	0.03	Monoterpenic aldehyde
Citronellal	0.33	0.04	Monoterpenic aldehyde
Borneol	4.92	0.64	Monoterpenic alcohol
Isoneral	0.38	0.05	Monoterpenic aldehyde
Terpinen-4-ol	0.52	0.07	Monoterpenic alcohol
para-Cymen-8-ol	0.32	0.04	Monoterpenic alcohol
α-Terpineol	2.61	0.34	Monoterpenic alcohol
Myrtenal	0.62	0.08	Monoterpenic aldehyde
Myrtenol	0.42	0.06	Monoterpenic alcohol
Decanal	8.35	1.09	Aliphatic aldehyde
2,3-Epoxyneral?	0.23	0.03	Monoterpenic aldehyde
Citronellol	2.02	0.26	Monoterpenic alcohol
Neral	12.08	1.58	Monoterpenic aldehyde
Unknown	0.59	0.08	Oxygenated monoterpene
Geraniol	3.53	0.46	Monoterpenic alcohol

Geranial	19.37	2.53	Monoterpenic aldehyde
Citronellyl formate	0.21	0.03	Monoterpenic ester
Bornyl acetate	0.80	0.11	Monoterpenic ester
2-Undecanone	1.22	0.16	Aliphatic ketone
2-Undecanol	0.31	0.04	Aliphatic alcohol
Carvacrol	0.66	0.09	Monoterpenic alcohol
3-Oxo-para-menth-1-en-7-al	0.19	0.02	Monoterpenic ketone
8-Hydroxy-neo-menthol	0.18	0.02	Monoterpenic alcohol
δ-Elemene	0.38	0.05	Sesquiterpene
Citronellyl acetate	0.95	0.12	Monoterpenic ester
Cyclosativene I	0.83	0.11	Sesquiterpene
Cyclosativene II	0.35	0.05	Sesquiterpene
Neryl acetate	0.36	0.05	Monoterpenic ester
α-Copaene	1.96	0.26	Sesquiterpene
Unknown	0.52	0.07	Unknown
β-Cubebene	0.24	0.03	Sesquiterpene
Geranyl acetate	3.92	0.51	Monoterpenic ester
β-Elemene	2.78	0.36	Sesquiterpene
Sesquithujene	1.00	0.13	Sesquiterpene
Dodecanal	0.54	0.07	Aliphatic aldehyde
β-Caryophyllene	0.58	0.08	Sesquiterpene
β-Copaene	0.24	0.03	Sesquiterpene
γ-Elemene	0.63	0.08	Sesquiterpene
trans-α-Bergamotene	0.45	0.06	Sesquiterpene
Nerylacetone?	0.49	0.06	Terpenic ketone
Sesquisabinene A	0.27	0.03	Sesquiterpene
α-Humulene	0.59	0.08	Sesquiterpene
allo-Aromadendrene	1.63	0.21	Sesquiterpene
Sesquisabinene B	1.00	0.13	Sesquiterpene
(*E*)-β-Farnesene	1.60	0.21	Sesquiterpene
Selina-4,11-diene	0.86	0.11	Sesquiterpene
γ-Muurolene	0.64	0.08	Sesquiterpene
Germacrene D	7.12	0.93	Sesquiterpene
ar-Curcumene	19.51	2.55	Sesquiterpene
Unknown	5.93	0.78	Sesquiterpene
epi-Cubebol	0.32	0.04	Sesquiterpenic alcohol
2-Tridecanone	0.35	0.05	Aliphatic ketone
Bicyclosesquiphellandrene?	11.31	1.48	Sesquiterpene
α-Zingiberene	118.30	15.46	Sesquiterpene
β-Bisabolene	26.56	3.47	Sesquiterpene
Cubebol	0.83	0.11	Sesquiterpenic alcohol
γ-Cadinene	2.00	0.26	Sesquiterpene
(3*E*,6*E*)-α-Farnesene	32.54	4.25	Sesquiterpene
7-epi-α-Selinene	0.76	0.10	Sesquiterpene
δ-Cadinene	1.82	0.24	Sesquiterpene
trans-Calamenene	0.16	0.02	Sesquiterpene
β-Sesquiphellandrene	45.85	5.99	Sesquiterpene
(*E*)-γ-Bisabolene	2.13	0.28	Sesquiterpene
Unknown	0.65	0.08	Oxygenated sesquiterpene
α-Elemol	1.86	0.24	Sesquiterpenic alcohol
Germacrene B	1.95	0.26	Sesquiterpene
cis-Sesquisabinene hydrate	0.86	0.11	Sesquiterpenic alcohol

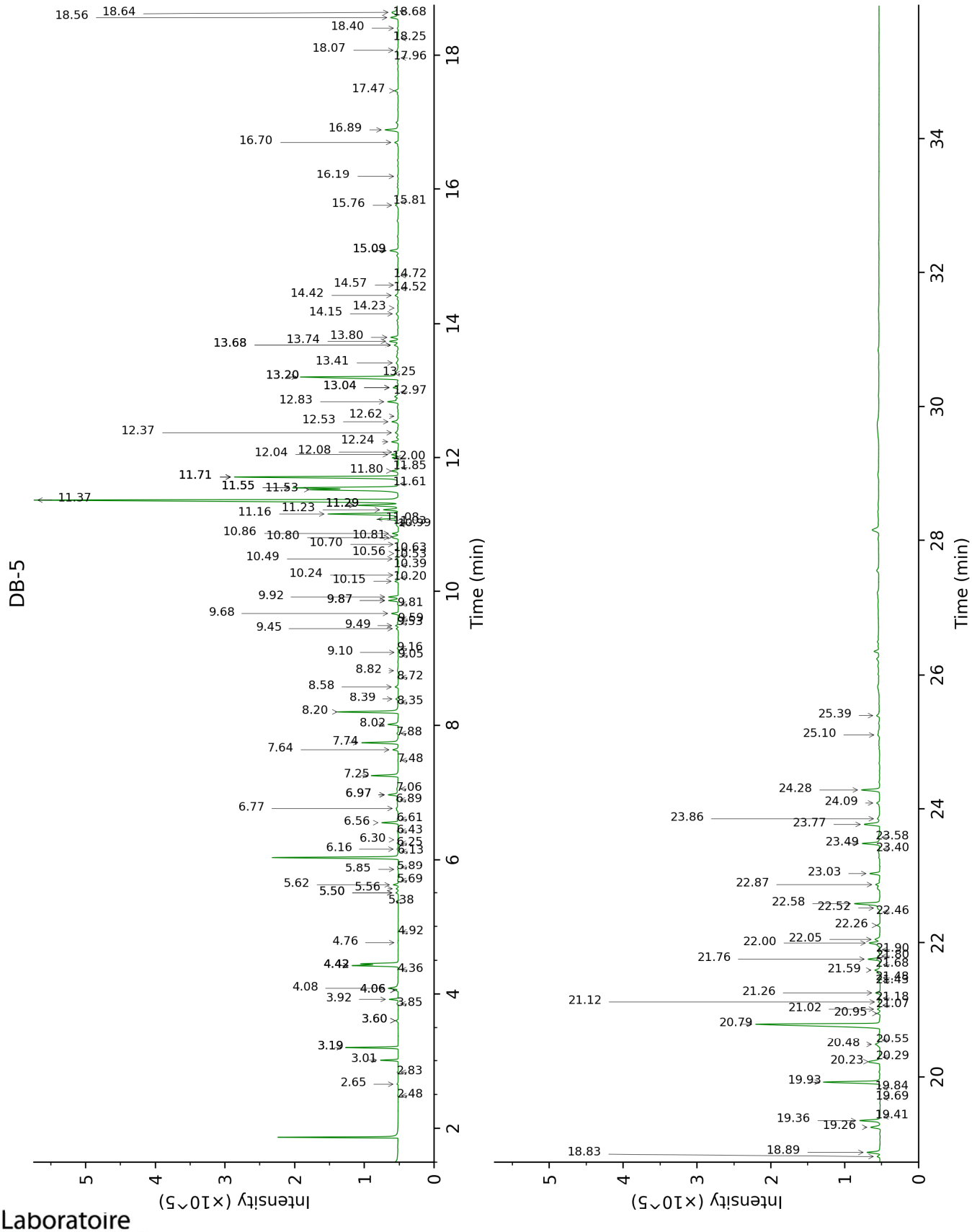
(*E*)-Nerolidol	2.14	0.28	Sesquiterpenic alcohol
ar-Turmerol	1.46	0.19	Sesquiterpenic alcohol
trans-Sesquisabinene hydrate	2.58	0.34	Sesquiterpenic alcohol
Unknown	0.22	0.03	Oxygenated sesquiterpene
cis-Zingiberenol	3.53	0.46	Sesquiterpenic alcohol
Unknown	0.81	0.11	Oxygenated sesquiterpene
γ-Eudesmol	0.70	0.09	Sesquiterpenic alcohol
trans-Zingiberenol	0.17	0.02	Sesquiterpenic alcohol
β-Eudesmol	1.90	0.25	Sesquiterpenic alcohol
Zingerone	43.27	5.65	Phenylbutanoid
α-Eudesmol	1.54	0.20	Sesquiterpenic alcohol
(3*E*,5*E*)-7-Hydroxyfarnesene	0.91	0.12	Sesquiterpenic alcohol
Zingerone methyl ether	0.38	0.05	Simple phenolic
α-Bisabolol	0.86	0.11	Sesquiterpenic alcohol
Unknown	3.29	0.43	Oxygenated sesquiterpene
Unknown	2.83	0.37	Oxygenated sesquiterpene
Unknown	1.14	0.15	Oxygenated sesquiterpene
Oplopanone	0.23	0.03	Sesquiterpenic alcohol
Xanthorizzhol?	1.38	0.18	Sesquiterpenic alcohol
Unknown	0.46	0.06	Oxygenated sesquiterpene
Unknown	0.57	0.07	Oxygenated sesquiterpene
Unknown	0.68	0.09	Oxygenated sesquiterpene
Unknown	3.33	0.44	Oxygenated sesquiterpene
Cryptomeridiol	0.83	0.11	Sesquiterpenic alcohol
Unknown	1.67	0.22	Oxygenated sesquiterpene
Unknown	0.86	0.11	Oxygenated sesquiterpene
Unknown	0.52	0.07	Oxygenated sesquiterpene
Geranyl-para-cymene	1.15	0.15	Diterpene
Palmitic acid	5.41	0.71	Aliphatic acid
(*E*,*E*)-Geranyllinalool	1.25	0.16	Diterpenic alcohol
[4]-Shogaol	0.59	0.08	Gingerol derivative
Unknown	0.82	0.11	Gingerol derivative
Unknown	0.55	0.07	Gingerol derivative
Unknown	0.41	0.05	Oxygenated diterpene
Linoleic acid	2.71	0.35	Aliphatic acid
Oleic acid	2.95	0.38	Aliphatic acid
cis-Vaccenic acid?	0.36	0.05	Aliphatic acid
[4]-Gingerol	1.19	0.16	Gingerol derivative
[4]-Isogingerol?	5.67	0.74	Gingerol derivative
[6]-Isoshogaol?	4.28	0.56	Gingerol derivative
[6]-Paradol	8.05	1.05	Gingerol derivative
Methyl [6]-isoshogaol?	0.16	0.02	Gingerol derivative
Methyl [6]-paradol?	0.42	0.05	Gingerol derivative
[6]-Dihydroparadol?	0.54	0.07	Gingerol derivative
[6]-Shogaol	22.03	2.88	Gingerol derivative
Methyl [6]-shogaol	6.33	0.83	Gingerol derivative
Acetoxy-[6]-dihydroparadol	0.35	0.05	Gingerol derivative
Diacetoxy-[4]-gingerdiol	3.13	0.41	Gingerol derivative
Geranyl laurate	0.53	0.07	Monoterpenic ester
[6]-Gingerol	68.62	8.97	Gingerol derivative
[6]-Isogingerol?	1.03	0.13	Gingerol derivative
[8]-Isoshogaol	0.94	0.12	Gingerol derivative

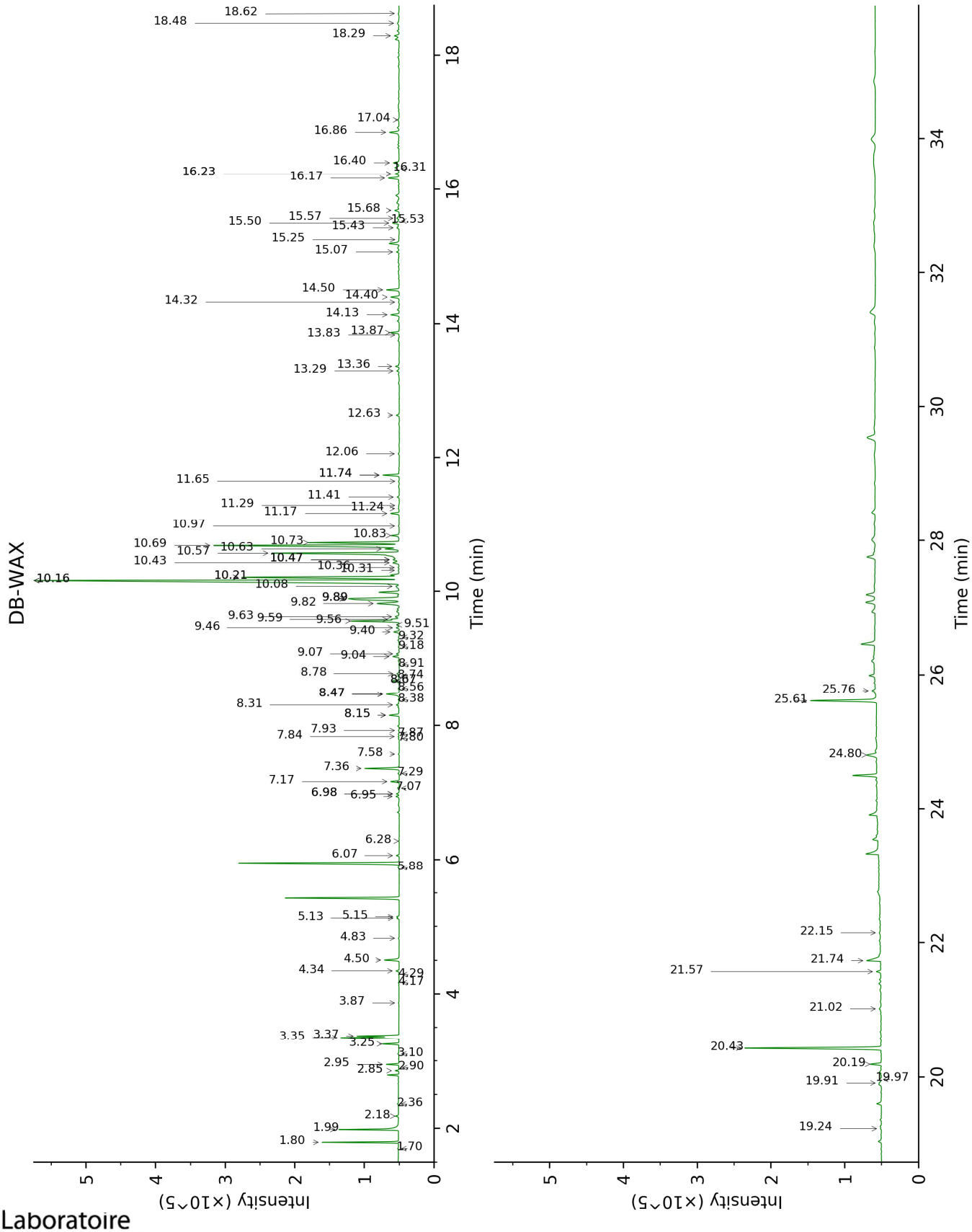
Unknown	0.47	0.06	Gingerol derivative
Methyl [6]-gingerol	0.75	0.10	Gingerol derivative
1-(4'-Hydroxy-3'-methoxyphenyl)-7-dodecen-3-one?	0.37	0.05	Gingerol derivative
[8]-Paradol	1.68	0.22	Gingerol derivative
Acetoxy-[6]-gingerol	0.51	0.07	Gingerol derivative
Unknown	0.44	0.06	Gingerol derivative
[6]-Gingerdiol isomer I	2.99	0.39	Gingerol derivative
[6]-Gingerdiol isomer II	0.30	0.04	Gingerol derivative
[8]-Shogaol	4.67	0.61	Gingerol derivative
5-Acetoxy-[6]-gingerdiol	1.00	0.13	Gingerol derivative
Methyl 5-acetoxy-[6]-gingerdiol	0.92	0.12	Gingerol derivative
Diacetoxy-[6]-gingerdiol	6.88	0.90	Gingerol derivative
[8]-Gingerdione	2.92	0.38	Gingerol derivative
1-Dehydro-[6]-gingerdione	1.33	0.17	Gingerol derivative
[8]-Gingerol	0.38	0.05	Gingerol derivative
1-(4'-Hydroxy-3'-methoxyphenyl)-7-tetradecen-3-one?	0.85	0.11	Gingerol derivative
[10]-Isoshogaol	11.61	1.52	Gingerol derivative
[10]-Paradol	1.69	0.22	Gingerol derivative
Unknown	4.33	0.57	Gingerol derivative
Unknown	0.29	0.04	Gingerol derivative
[10]-Shogaol	7.03	0.92	Gingerol derivative
Unknown	1.13	0.15	Gingerol derivative
[10]-Gingerdione	7.76	1.01	Gingerol derivative
1-Dehydro-[8]-gingerdione	1.20	0.16	Gingerol derivative
[12]-Isoshogaol?	1.53	0.20	Gingerol derivative
Unknown	7.51	0.98	Gingerol derivative
[12]-Shogaol	1.08	0.14	Gingerol derivative
[12]-Gingerdione	1.33	0.17	Gingerol derivative
Consolidated total	**720.67 mg/g**	**94.16%**	

Individual compounds contents were corrected following the method of Cachet et al., 2016 (Flavour and Fragrance Journal guidelines).
Unknown compounds are expressed in equivalents of internal standard without correction.

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.


DB-5
Intensity (×10^5)
Time (min)
18.56
18.64
18.68
18.40
18.25
18.07
17.96
17.47
16.89
16.70
16.19
15.76
15.81
15.09
14.72
14.57
14.52
14.42
14.23
14.15
13.74
13.80
13.68
13.41
13.25
13.20
13.04
12.97
12.83
12.62
12.53
12.37
12.24
12.08
12.04
12.00
11.80
11.85
11.71
11.61
11.55
11.53
11.37
11.29
11.23
11.16
10.86
10.80
10.81
10.70
10.63
10.56
10.49
10.39
10.24
10.20
10.15
9.92
9.87
9.81
9.68
9.59
9.45
9.49
9.10
9.16
9.05
8.82
8.72
8.58
8.39
8.35
8.20
8.02
7.88
7.74
7.64
7.48
7.25
7.06
6.97
6.89
6.77
6.61
6.56
6.43
6.30
6.25
6.16
6.13
5.85
5.89
5.62
5.69
5.56
5.50
5.38
4.92
4.76
4.42
4.36
4.08
4.06
3.92
3.85
3.60
3.19
3.01
2.83
2.65
2.48
25.39
25.10
24.28
24.09
23.86
23.77
23.58
23.49
23.40
23.03
22.87
22.58
22.52
22.46
22.26
22.00
22.05
21.90
21.80
21.76
21.68
21.59
21.48
21.45
21.26
21.18
21.12
21.07
21.02
20.95
20.79
20.55
20.48
20.29
20.23
19.93
19.84
19.69
19.41
19.36
19.26
18.83
18.89


DB-WAX
Intensity (×10^5)
Time (min)
18.62
18.48
18.29
17.04
16.86
16.40
16.31
16.23
16.17
15.68
15.57
15.53
15.50
15.43
15.25
15.07
14.50
14.40
14.32
14.13
13.83
13.87
13.29
13.36
12.63
12.06
11.74
11.65
11.41
11.29
11.24
11.17
10.97
10.83
10.73
10.69
10.63
10.57
10.47
10.43
10.31
10.21
10.16
10.08
9.89
9.82
9.63
9.59
9.56
9.51
9.46
9.40
9.32
9.18
9.07
9.04
8.91
8.78
8.74
8.56
8.47
8.38
8.31
8.15
7.93
7.87
7.84
7.80
7.58
7.36
7.29
7.17
7.07
6.98
6.95
6.28
6.07
5.88
5.15
5.13
4.83
4.50
4.34
4.29
4.17
3.87
3.37
3.35
3.25
3.10
2.95
2.90
2.85
2.36
2.18
1.99
1.80
1.70
25.76
25.61
24.80
22.15
21.74
21.57
21.02
20.43
20.19
19.97
19.91
19.24

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	mg/g	R.T	R.I	mg/g
Hexanal	1.46	808	14.09	1.98	1051	13.86
2-Heptanone	2.48	895	0.18	3.10	1147	0.29
2-Heptanol	2.65	908	0.57	5.13	1296	0.54
Tricyclene	2.83	920	0.30	1.36	985	0.20
α-Pinene	3.01	932	3.76	1.47	999	3.54
Camphene	3.20*	944	10.99	1.80	1032	10.66
α-Fenchene	3.20*	944	[10.99]	1.70	1023	0.09
β-Pinene	3.60*	972	0.75	2.18	1071	0.53
Sabinene	3.60*	972	[0.75]	2.36	1089	0.15
6-Methyl-5-hepten-2-one	3.86	989	0.51	5.15	1298	0.62
Myrcene	3.92	993	2.15	2.95	1135	2.06
α-Phellandrene	4.06*	1002	0.64	2.85	1128	0.60
Pseudolimonene	4.06*	1002	[0.64]	2.90	1132	0.05
Octanal	4.08	1004	4.24	4.50	1252	4.13
para-Cymene	4.36	1022	0.17	4.17	1228	0.17
Limonene	4.42*†	1026	21.16	3.25	1159	2.90
Unknown [m/z 59, 43 (11), 109 (10), 41 (10), 127 (8)...]	4.42*†	1026	[27.67]	6.28	1379	0.16
β-Phellandrene	4.42*†	1026	[21.16]	3.35	1166	10.43
1,8-Cineole	4.42*†	1026	[24.04]	3.37	1169	8.36
2-Heptyl acetate	4.76	1047	0.07	4.29	1236	0.16
γ-Terpinene	4.92	1057	0.08	3.87	1206	0.12
Terpinolene	5.38	1086	0.69	4.34	1240	0.63
2-Nonanone	5.50*	1094	0.97	5.88	1350	0.40
Unknown [m/z 96, 109 (55), 79 (41), 67 (38), 41 (36)... 150 (3)]	5.50*	1094	[1.12]	8.74	1564	0.64
Rosefuran	5.56	1098	0.76	6.07	1363	0.75
Linalool	5.62	1102	1.71	8.15*	1518	2.80
2-Nonanol	5.69	1106	0.38	7.80	1492	0.25
(*E*)-4,8-Dimethylnona-1,3,7-triene	5.85	1117	0.21	4.83	1275	0.21
trans-Pinene hydrate	5.89	1119	0.35	7.93	1501	0.27
Unknown [m/z 83, 43 (99), 97 (75), 59 (44)...]	6.13	1135	0.15			
Camphor	6.16	1137	0.61	7.29	1452	0.36
Camphene hydrate	6.25	1142	0.36	8.56	1549	0.38
exo-Isocitral	6.30	1146	0.24	7.58	1473	0.23
Citronellal	6.43	1154	0.33	7.07	1436	0.46
Borneol	6.56	1162	4.92	9.89*	1654	20.84
Isoneral	6.61	1166	0.38	7.87	1497	0.31
Terpinen-4-ol	6.77	1176	0.52	8.67*	1558	2.35
para-Cymen-8-ol	6.89	1184	0.32	11.65	1800	0.25
α-Terpineol	6.97*	1189	3.20	9.89*	1654	[20.84]
Myrtenal	6.97*	1189	[3.34]	8.78	1566	0.62
Myrtenol	7.06	1195	0.42	10.98	1744	0.25
Decanal	7.26	1208	8.35	7.36	1457	8.16
2,3-Epoxyneral?	7.48	1224	0.23			

Citronellol	7.64	1232	2.02	10.83	1732	2.17
Neral	7.74	1239	12.08	9.56	1628	12.10
Unknown [m/z 109, 119 (84), 91 (81), 134 (55)... 137 (27)...]	7.88	1248	0.59	11.41	1780	0.65
Geraniol	8.02	1257	3.53	11.74*	1808	4.03
Geranial	8.20	1269	19.37	10.21*	1680	46.34
Citronellyl formate	8.35	1279	0.21	8.91	1577	0.17
Bornyl acetate	8.39	1282	0.80	8.31	1530	0.84
2-Undecanone	8.58	1295	1.22	8.67*	1558	[2.27]
2-Undecanol	8.72	1304	0.31	10.36	1692	0.31
Carvacrol	8.82	1311	0.66	15.53	2160	0.24
3-Oxo-para-menth-1-en-7-al	9.05	1327	0.19			
8-Hydroxy-neo-menthol	9.10	1331	0.18	14.32	2042	0.29
δ-Elemene	9.16	1335	0.38	6.98*	1430	0.63
Citronellyl acetate	9.45	1355	0.95	9.51	1623	0.73
Cyclosativene I	9.49	1359	0.83	6.95	1427	0.86
Cyclosativene II	9.53	1361	0.35	6.98*	1430	[0.63]
Neryl acetate	9.59	1365	0.36	10.32	1688	0.33
α-Copaene	9.68	1371	1.96	7.17	1443	1.80
Unknown [m/z 139, 69 (63), 83 (53), 43 (49), 41 (39)...]	9.82	1381	0.52	16.23*	2231	1.58
β-Cubebene	9.87*	1385	2.96	7.84	1494	0.24
Geranyl acetate	9.87*	1385	[3.77]	10.63	1715	3.92
β-Elemene	9.92	1389	2.78	8.47*	1542	3.61
Sesquithujene	10.15	1405	1.00	8.15*	1518	[2.42]
Dodecanal	10.20	1409	0.54	10.08	1669	1.52
β-Caryophyllene	10.24	1412	0.58	8.47*	1542	[3.61]
β-Copaene	10.39	1423	0.24	8.38	1536	0.32
γ-Elemene	10.49	1430	0.63	9.08	1589	0.68
trans-α-Bergamotene	10.53	1434	0.45	8.47*	1542	[3.61]
Nerylacetone?	10.56	1436	0.49	11.74*	1808	[3.89]
Sesquisabinene A	10.63	1440	0.27	9.18	1597	0.23
α-Humulene	10.70	1446	0.59	9.32	1609	0.21
allo-Aromadendrene	10.80	1453	1.63	9.04	1586	1.48
Sesquisabinene B	10.82	1454	1.00	9.40	1615	1.29
(*E*)-β-Farnesene	10.86	1458	1.60	9.59	1630	1.42
Selina-4,11-diene	10.99	1468	0.86	9.46	1620	0.70
γ-Muurolene	11.03	1470	0.64	9.63	1633	1.09
Germacrene D	11.08	1474	7.12	9.82	1649	6.48
ar-Curcumene	11.16	1480	19.51	10.73	1723	17.52
Unknown [m/z 161, 91 (100), 105 (93), 79 (89), 93 (89), 107 (79)... 204 (34)]	11.23	1485	5.93	10.16*	1676	151.44
epi-Cubebol	11.29*	1490	13.01	12.06	1836	0.32
2-Tridecanone	11.29*	1490	[12.95]	11.24	1766	0.35
Bicyclosesquiphellandrene?	11.29*	1490	[11.93]	9.89*	1654	[18.02]
α-Zingiberene	11.37	1496	118.30	10.16*	1676	[113.75]
β-Bisabolene	11.52	1507	26.56	10.21*	1680	[39.24]
Cubebol	11.55*	1510	31.19	12.63	1886	0.83
γ-Cadinene	11.55*	1510	[28.60]	10.43	1698	2.00

(3*E*,6*E*)-α-Farnesene	11.55*	1510	[28.60]	10.57	1710	32.54
7-epi-α-Selinene	11.61	1514	0.76	10.47*	1701	1.71
δ-Cadinene	11.71*	1522	47.84	10.47*	1701	[1.71]
trans-Calamenene	11.71*	1522	[45.02]	11.29	1770	0.16
β-Sesquiphellandrene	11.71*	1522	[47.84]	10.68	1719	45.85
(*E*)-γ-Bisabolene	11.80	1529	2.13	10.47*	1701	[1.71]
Unknown [m/z 177, 159 (67), 41 (43), 91 (43), 43 (41)... 220 (t)]	11.85	1533	0.65	13.36	1952	1.09
α-Elemol	12.00	1545	1.86	14.13	2025	2.28
Germacrene B	12.04	1548	1.95	11.17	1760	1.90
cis-Sesquisabinene hydrate	12.08	1551	0.86	13.29	1946	0.78
(*E*)-Nerolidol	12.24	1563	2.14	13.87	1999	2.15
ar-Turmerol	12.37	1574	1.46	15.68	2175	1.21
trans-Sesquisabinene hydrate	12.53	1587	2.58	14.40	2050	2.27
Unknown [m/z 132, 118 (89), 145 (85), 119 (79), 117 (60)...]	12.62	1593	0.22	13.83	1996	0.16
cis-Zingiberenol	12.83	1610	3.53	14.50	2060	3.30
Unknown [m/z 119, 85 (92), 105 (37), 120 (36), 91 (28)... 218 (6)]	12.98	1622	0.81	16.31	2239	0.75
γ-Eudesmol	13.04*	1628	1.57	15.07	2114	0.70
trans-Zingiberenol	13.04*	1628	[1.57]	15.25	2132	0.17
β-Eudesmol	13.20*	1641	35.34	15.50	2157	1.90
Zingerone	13.20*	1641	[44.86]	20.43	2698	43.27
α-Eudesmol	13.25	1645	1.54	15.43	2150	0.77
(3*E*,5*E*)-7-Hydroxyfarnesene	13.41	1658	0.91	16.40	2248	1.77
Zingerone methyl ether	13.68*	1681	1.84	19.24	2557	0.38
α-Bisabolol	13.68*	1681	[1.50]	15.57	2164	0.86
Unknown [m/z 137, 119 (70), 84 (69), 41 (68), 69 (53), 55 (45), 109 (38)... 222 (2)]	13.74	1685	3.29	16.17	2224	3.65
Unknown [m/z 69, 41 (59), 118 (33), 43 (32), 55 (31)... 234? (t)]	13.80	1690	2.83	16.86	2296	3.60
Unknown [m/z 119, 91 (31), 105 (29), 41 (25), 133 (23), 158 (21)...]	14.15	1720	1.14	17.04	2315	0.56
Oplopanone	14.23	1727	0.23	18.29	2450	1.54
Xanthorizzhol?	14.42	1744	1.38			
Unknown [m/z 82, 43 (85), 91 (67), 93 (66), 41 (66), 69 (59), 106 (47)... 218 (5)...]	14.52	1752	0.46			
Unknown [m/z 43, 82 (100), 41 (86), 69 (76), 93 (72), 91 (72)... 218 (4)...]	14.58	1757	0.57			
Unknown [m/z 79, 41 (77), 135 (75), 69 (74), 43 (70)... 220 (9)]	14.72	1769	0.68	18.62	2487	0.44
Unknown [m/z 69, 43 (95),	15.09*	1801	3.96	20.19	2669	3.33

41 (84), 109 (78), 95 (54), 93 (49)... 177 (36), 220 (2)...]						
Cryptomeridiol	15.09*	1801	[3.51]	19.97	2642	0.83
Unknown [m/z 109, 69 (58), 43 (56), 41 (42), 135 (37), 55 (27)... 220 (5)]	15.76	1862	1.67	21.57	2839	1.50
Unknown [m/z 137, 218 (84), 119 (72), 69 (64), 175 (61), 41 (60), 93 (58)]	15.81	1867	0.86	21.02	2769	1.08
Unknown [m/z 125, 41 (86), 151 (78), 109 (67), 69 (63)... 236 (22)]	16.19	1901	0.52	22.15	2912	0.67
Geranyl-para-cymene	16.70	1950	1.15	16.23*	2231	[1.13]
Palmitic acid	16.89	1968	5.41	21.74	2859	6.21
(*E*,*E*)-Geranyllinalool	17.47	2024	1.25	18.48	2471	0.87
[4]-Shogaol	17.96	2073	0.59			
Unknown [m/z 135, 150 (34), 77 (13), 163 (11)... 262 (2)]	18.07	2084	0.82			
Unknown [m/z 137, 203 (15), 138 (11), 105 (11), 41 (9)... 274 (7), 286? (1)]	18.25	2101	0.55			
Unknown [m/z 69, 41 (44), 121 (37), 107 (36), 81 (33)... 272 (2)]	18.40	2117	0.41			
Linoleic acid	18.56	2134	2.71			
Oleic acid	18.64	2142	2.95			
cis-Vaccenic acid?	18.68	2146	0.36			
[4]-Gingerol	18.83	2161	1.19			
[4]-Isogingerol?	18.89	2168	5.67			
[6]-Isoshogaol?	19.26	2206	4.28	24.80	3272	4.49
[6]-Paradol	19.36	2217	8.05			
Methyl [6]-isoshogaol?	19.41	2223	0.16			
Methyl [6]-paradol?	19.69	2253	0.42			
[6]-Dihydroparadol?	19.84	2270	0.54	25.76	3413	1.18
[6]-Shogaol	19.92	2278	22.03	25.61	3390	20.26
Methyl [6]-shogaol	20.23	2311	6.33			
Acetoxy-[6]-dihydroparadol	20.29	2319	0.35			
Diacetoxy-[4]-gingerdiol	20.48	2340	3.13			
Geranyl laurate	20.54	2347	0.53	19.91	2636	0.65
[6]-Gingerol	20.79	2375	68.62			
[6]-Isogingerol?	20.95	2393	1.03			
[8]-Isoshogaol	21.02	2400	0.94			
Unknown [m/z 137, 138 (9), 316 (6), 122 (5)]	21.07	2406	0.47			
Methyl [6]-gingerol	21.12	2412	0.75			
1-(4'-Hydroxy-3'-methoxyphenyl)-7-dodecen-3-one?	21.18	2419	0.37			
[8]-Paradol	21.26	2428	1.68			
Acetoxy-[6]-gingerol	21.43	2448	0.51			
Unknown [m/z 137, 316	21.48	2454	0.44			

(31), 109 (24), 179 (21), 150 (20)]				
[6]-Gingerdiol isomer I	21.60	2468	2.99	
[6]-Gingerdiol isomer II	21.68	2477	0.30	
[8]-Shogaol	21.76	2487	4.67	
5-Acetoxy-[6]-gingerdiol	21.80	2492	1.00	
Methyl 5-acetoxy-[6]-gingerdiol	21.90	2503	0.92	
Diacetoxy-[6]-gingerdiol	22.00	2515	6.88	
[8]-Gingerdione	22.05	2522	2.92	
1-Dehydro-[6]-gingerdione	22.26	2547	1.33	
[8]-Gingerol	22.46	2571	0.38	
1-(4'-Hydroxy-3'-methoxyphenyl)-7-tetradecen-3-one?	22.52	2578	0.85	
[10]-Isoshogaol	22.58	2586	11.61	
[10]-Paradol	22.87	2621	1.69	
Unknown [m/z 137, 109 (24), 207 (24), 43 (24)... 344 (14)]	23.03	2641	4.33	
Unknown [m/z 137, 55 (23), 41 (21), 69 (18), 150 (17), 135 (14)... 330 (12)]	23.40	2688	0.29	
[10]-Shogaol	23.49	2699	7.03	
Unknown [m/z 137, 205 (13), 332 (9), 122 (7)]	23.58	2711	1.13	
[10]-Gingerdione	23.77	2736	7.76	
1-Dehydro-[8]-gingerdione	23.86	2746	1.20	
[12]-Isoshogaol?	24.09	2777	1.53	
Unknown [m/z 137, 138 (8), 122 (6), 372 (6)]	24.28	2802	7.51	
[12]-Shogaol	25.10	2912	1.08	
[12]-Gingerdione	25.39	2952	1.33	

*: 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
Individual compounds contents were corrected following the method of Cachet et al., 2016 (Flavour and Fragrance Journal guidelines).
Unknown compounds are expressed in equivalents of internal standard without correction.
R.T.: Retention time (minutes)
R.I.: Retention index