

Angelica archangelica

ESSENTIAL OIL ANALYSIS

Laboratoire
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SAMPLE IDENTIFICATION

Internal code : 17E10-FSE2-1-DM

Customer identification : Angelica Root - Lot #HEL17D441

Type : Essential oil

Source : Angelica archangelica

Customer : Flowers Shining Everywhere Inc.



ANALYSIS

Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2017-05-18

Checked and approved by :



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




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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
<i>trans</i> -1,3-Pentadiene	0.38	635	0.18	0.17	235	0.33	Alkene
Heptane	0.79	690	0.03				Alkane
Toluene	1.31	758	0.05	24.17	952	1.14*	Simple phenolic
Hashishene	3.23	917	0.02	[24.17]	952	1.14*	Monoterpene
α -Thujene	3.31	923	0.78	1.20	957	1.16	Monoterpene
α -Pinene	3.46	931	24.52	[24.17]	952	1.14*	Monoterpene
Camphene	3.70*	946	1.27	1.24	1000	1.37	Monoterpene
α -Fenchene	3.70*	946	[1.27]	0.04	993	1.32	Monoterpene
Thuja-2,4(10)-diene	3.79	951	0.26	3.53	1054	1.89*	Monoterpene
Sabinene	4.14	972	3.34	[3.53]	1054	1.89*	Monoterpene
β -Pinene	4.20	975	1.21	1.20	1038	1.72	Monoterpene
Myrcene	4.49	992	5.50	5.52	1118	2.47*	Monoterpene
2-Carene	4.58	998	0.18	16.29	1084	2.23*	Monoterpene
Pseudolimonene	4.70	1005	0.07	8.78	1112	2.39*	Monoterpene
Δ^3 -Carene	4.80*	1010	25.06	[16.29]	1084	2.23*	Monoterpene
α -Phellandrene	4.80*	1010	[25.06]	[8.78]	1112	2.39*	Monoterpene
α -Terpinene	4.94	1018	0.91	0.97	1122	2.53	Monoterpene
meta-Cymene	5.07	1025	0.28	[5.52]	1118	2.47*	Monoterpene
β -Phellandrene	5.20*	1032	11.29	10.76	1150	2.88*	Monoterpene
Limonene	5.20*	1032	[11.29]	7.54	1142	2.79	Monoterpene
para-Cymene	5.20*	1032	[11.29]	1.31	1208	3.64	Monoterpene
1,8-Cineole	5.23	1034	7.96	[10.76]	1150	2.88*	Monoterp. ether
<i>cis</i> - β -Ocimene	5.35	1040	1.81	1.25	1188	3.38	Monoterpene
<i>trans</i> - β -Ocimene	5.54	1051	5.21	5.17	1203	3.57	Monoterpene
γ -Terpinene	5.71	1060	1.43	2.06	1185	3.35	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	5.95	1073	tr	0.01	1382	6.26	Monoterp. alcohol
Isoterpinolene	6.10	1081	0.71	0.68	1218	3.78	Monoterpene
Terpinolene	6.18	1086	1.27	1.27	1223	3.85	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	6.29	1092	0.01	0.01	1409	6.67	Monoterp. alcohol
para-Cymenene	6.37	1096	0.07	0.07	1364	5.99	Monoterpene
6,7-Epoxymyrcene	6.50	1102	0.04	0.05	1356	5.84	Monoterp. ether
Linalool	6.62	1107	0.02	0.22	1489	8.55*	Monoterp. alcohol
Octen-3-yl acetate	6.81	1113	0.02	0.02	1325	5.36	Aliphatic ester
<i>cis</i> -para-Menth-2-en-1-ol	7.14	1126	0.22	[0.22]	1489	8.55*	Monoterp. alcohol
<i>cis</i> -Limonene oxide	7.28	1131	0.02	0.02	1368	6.05	Monoterp. ether
<i>trans</i> -Limonene oxide	7.44	1136	0.03	0.04	1391	6.40	Monoterp. ether
<i>trans</i> -Pinocarveol	7.49	1138	0.03	0.03	1569	11.07	Monoterp. alcohol
1-Terpineol	7.60	1142	0.04	0.08	1517	9.20*	Monoterp. alcohol
<i>cis</i> -para-Mentha-2,8-dien-1-ol	7.64	1144	0.12	0.13	1595	12.03	Monoterp. alcohol
Camphor	7.79	1149	0.03	0.03	1417	6.82	Monoterp. ketone

α -Phellandren-8-ol	8.49	1175	0.12			Monoterp. alcohol
(3E,5Z)-1,3,5-Undecatriene	8.59	1179	0.13	0.13	1340 5.61	Alkene
Terpinen-4-ol	8.70	1183	0.68	0.73	1527 9.54	Monoterp. alcohol
Cryptone	9.09	1197	0.03	0.04	1563 10.85	Monoterp. ketone
para-Cymen-8-ol	9.18	1200	0.03	0.03	1763 20.88	Monoterp. alcohol
α -Terpineol	9.25	1202	0.11	0.07	1623 13.09	Monoterp. alcohol
α -Phellandrene epoxide	9.32	1203	0.06	0.08	1717 18.01	Monoterpene
trans-Piperitol	9.81	1214	0.08	0.08	1669 15.48	Monoterp. alcohol
Phellandral	12.74	1279	0.05	0.15	1618 12.92*	Monoterp. aldehyde
Bornyl acetate	12.84	1281	0.56	0.59	1500 8.79	Monoterp. ester
trans-Sabinyl acetate	13.43	1294	0.14	0.15	1565 10.94	Monoterp. ester
Unknown (m/z = 111, 126 (90), 43 (86), 71 (50), 109 (32)...) 	15.75	1331	0.05	0.06	2109 39.54	
α -Ylangene	17.14	1352	0.01	0.01	1422 6.94	Sesquiterpene
α -Copaene	17.60	1359	0.23	0.26	1429 7.10	Sesquiterpene
β -Elemene	18.79	1378	0.04	0.05	1522 9.36	Sesquiterpene
β -Caryophyllene	20.44	1402	0.04	[0.08]	1517 9.20*	Sesquiterpene
α -Humulene	23.21	1435	0.26	0.28	1576 11.36	Sesquiterpene
trans- β -Farnesene	24.38	1449	0.03	0.03	1612 12.70	Sesquiterpene
Germacrene D	25.40	1462	0.11	[0.15]	1618 12.92*	Sesquiterpene
α -Murolene	27.43	1486	0.06	0.06	1642 14.09	Sesquiterpene
Cuparene	27.61	1488	0.03	0.04	1724 18.31	Sesquiterpene
β -Bisabolene	28.65	1501	0.02	0.03	1654 14.71	Sesquiterpene
δ -Cadinene	29.12	1507	0.06	0.08	1666 15.30	Sesquiterpene
α -Copaen-11-ol	31.43	1540	0.15	0.16	1958 33.83	Sesquiterp. alcohol
α -Elemol	32.26	1551	0.07	0.07	1994 35.44	Sesquiterp. alcohol
Caryophyllene oxide	33.63*	1570	0.09	0.06	1838 25.90	Sesquiterp. ether
Spathulenol	33.63*	1570	[0.09]	0.01	2018 36.50	Sesquiterp. alcohol
Tridecanolide	36.18	1610	0.31	0.31	1913 31.30	Lactone
Exaltolide	43.30	1810	0.18	0.19	2116 39.77	Lactone
Osthole	51.33	2135	0.20	0.24	3118 59.53	Coumarin
Total identified			97.87%	97.79%		

*: Two or more compounds are coeluting on this column

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

Note: no correction factor was applied

OTHER DATA

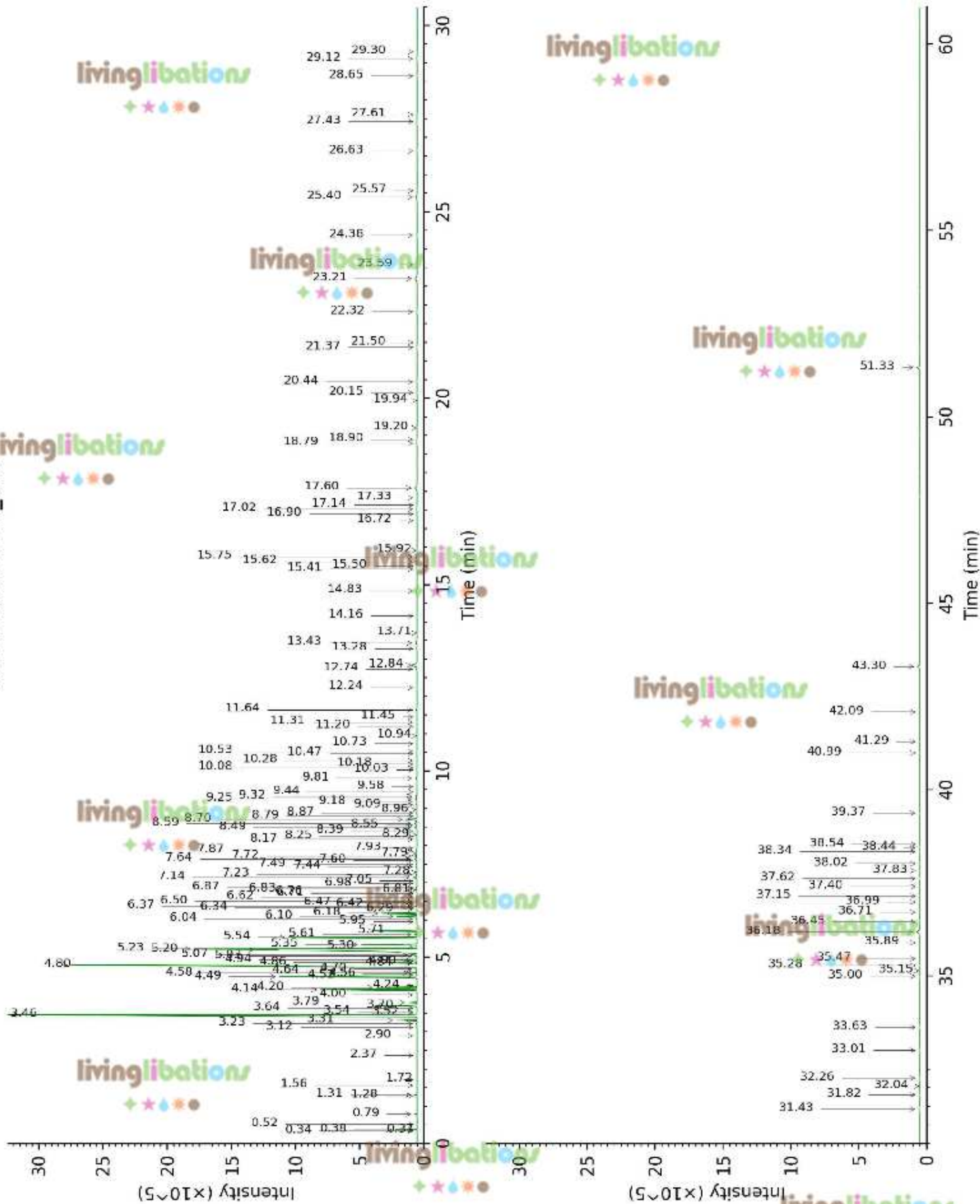
Physical aspect : Faintly green

Refractive index : 1.4730 \pm 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent were detected using this method.

17E10-FSE2-1-DM_BP5



17E10-FSE2-1-DM_WAX

