



PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: H90105

ESSENTIAL OIL: HELICHRYSUM ITALICUM ORGANIC

BOTANICAL NAME: HELICHRYSUM ITALICUM

ORIGIN: CROATIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF HELICHRYSUM ITALICUM OIL	%
α -PINENE	32.8
γ -CURCUMENE	14.1
β -CARYOPHYLLENE	5.3
ITALIDIONE ISOMER + β -SELINENE	5.0
NERYL ACETATE	4.3
LIMONENE	4.0
α -SELINENE	3.6
ITALICENE	3.4
ISOITALICENE	2.8
ITALIDIONE I	2.1
ITALIDIONE II	1.4
α -CURCUMENE	1.3
γ -SELINENE	1.3
ISOAMYL ANGELATE	1.3

Comments from Robert Tisserand: Light, spicy-honeyed odor profile. This is an alpha-pinene chemotype. Contains 7.6% total italidiones.

Date : October 27, 2017

SAMPLE IDENTIFICATION

Internal code : 17J17-PTH1-1-CC

Customer identification : Helichrysum Italicum Organic - Croatia - H90105610R

Type : Essential oil

Source : *Helichrysum italicum*

Customer : Croatia

ANALYSIS

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

Identifications double-checked by GC-MS

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2017-10-25

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.	
3-Pentanone	0.71	679	0.01	0.01	861	0.83	Aliphatic ketone
2-Methyl-3-pentanone	1.19	742	0.11	0.11	900	0.97	Aliphatic ketone
2-Methyl-2-heptene	1.59	794	0.11				Alkene
4-Methyl-3-hexanone	2.13	837	0.18	0.26	1003	1.46*	Aliphatic ketone
Bornylene	2.95	899	0.04	0.08	875	0.88	Monoterpene
α -Thujene	3.32	921	0.03	32.70	962	1.21*	Monoterpene
α -Pinene	3.48	930	32.84	[32.70]	962	1.21*	Monoterpene
α -Fenchene	3.69	943	0.42	0.47	997	1.41	Monoterpene
Camphene	3.72	944	0.15	[0.26]	1003	1.46*	Monoterpene
Thuja-2,4(10)-diene	3.81	949	0.02	0.04	1055	1.99*	Monoterpene
Sabinene	4.14	969	tr	[0.04]	1055	1.99*	Monoterpene
β -Pinene	4.21	973	0.62	0.58	1041	1.83	Monoterpene
Myrcene	4.49	989	0.10	0.07	1118	2.59	Monoterpene
6-Methyl-5-hepten-2-one	4.59	996	0.01	0.01	1278	4.81	Aliphatic ketone
α -Phellandrene	4.76*	1005	0.11	0.03	1113	2.51	Monoterpene
6-Methyl-5-hepten-2-ol	4.76*	1005	[0.11]	0.07	1414	7.02	Aliphatic alcohol
α -Terpinene	4.95	1015	0.25	0.33	1126	2.69	Monoterpene
para-Cymene	5.16	1027	0.15	0.23	1212	3.83	Monoterpene
Limonene	5.19	1029	3.99	4.46	1144	2.93*	Monoterpene
β -Phellandrene	5.22	1030	0.02	[4.46]	1144	2.93*	Monoterpene
1,8-Cineole	5.24	1031	0.47	[4.46]	1144	2.93*	Monoterp. ether
cis- β -Ocimene	5.36	1038	0.02	0.54	1193	3.56*	Monoterpene
trans- β -Ocimene	5.54	1048	0.05	0.03	1206	3.74	Monoterpene
Isobutyl angelate	5.66	1054	0.44	0.63	1239	4.24*	Aliphatic ester
γ -Terpinene	5.74	1058	0.53	[0.54]	1193	3.56*	Monoterpene
Terpinolene	6.21	1084	0.20	0.19	1227	4.06	Monoterpene
para-Cymenene	6.46	1098	0.02	0.01	1370	6.24	Monoterpene
2,4-Dimethyl-heptane-3,5-dione	6.58	1102	0.05	0.04	1458	8.06*	Aliphatic ketone
2-Methylbutyl 2-methylbutyrate	6.63	1104	0.15	[0.63]	1239	4.24*	Aliphatic ester
Linalool	6.72	1107	0.61	0.66	1498	9.00	Monoterp. alcohol
Nonanal	6.82	1111	0.04	0.03	1333	5.66	Aliphatic aldehyde
endo-Fenchol	7.18	1124	0.04	0.04	1510	9.37	Monoterp. alcohol
trans-Pinocarveol	7.65	1141	0.05	0.16	1567	11.48	Monoterp. alcohol
Camphor	7.79	1146	0.04	0.04	1420	7.16	Monoterp. ketone
Isoamyl angelate	7.90	1150	1.29	1.32	1344	5.83	Aliphatic ester
Borneol	8.68	1178	0.06	18.71	1633	14.31*	Monoterp. alcohol
Terpinen-4-ol	8.84	1184	0.24	0.24	1540	10.47*	Monoterp. alcohol
Dimethyl octanedione isomer	8.91	1186	0.21	5.97	1524	9.91*	β -diketone

4,6-Dimethyl-3,5-octanedione	8.97	1189	0.21	[0.24]	1540	10.47*	β-diketone
α-Terpineol	9.52	1204	0.28	[18.71]	1633	14.31*	Monoterp. alcohol
Unknown (m/z = 81, 168 (64), 67 (59), 140 (49) 41 (46))	9.86	1212	0.05				
Unknown (m/z = 81, 168 (53), 67 (49), 140 (47), 41 (44))	10.47	1225	0.15				
Nerol	10.63	1229	0.31	0.82	1730	19.66*	Monoterp. alcohol
Neral	11.38	1245	0.06	1.76	1604	12.83*	Monoterp. aldehyde
3-Methylamyl angelate	11.62*	1251	0.07	[0.04]	1458	8.06*	Aliphatic ester
cis-Isogeraniol	11.62*	1251	[0.07]	0.05	1754	21.28	Monoterp. alcohol
Hexyl angelate	13.29	1287	0.45	0.86	1616	13.43*	Aliphatic ester
α-Ylangene	17.20	1350	0.30	0.44	1426	7.33*	Sesquiterpene
2,6-Dimethyl-1,7-octadiene-3,6-diol	17.30	1351	0.23	0.23	1996	36.34	Monoterp. alcohol
Isoitalicene	17.81*	1359	2.60	2.82	1436	7.55	Sesquiterpene
α-Copaene	17.81*	1359	[2.60]	[0.44]	1426	7.33*	Sesquiterpene
Neryl acetate	18.05	1362	4.34	4.60	1664	15.96*	Monoterp. ester
Geranyl acetate	19.55	1385	0.12	1.32	1702	17.92*	Monoterp. ester
Italicene	19.78	1389	3.42	3.50	1478	8.55	Sesquiterpene
β-Caryophyllene	20.78*	1402	5.17	[5.97]	1524	9.91*	Sesquiterpene
cis-α-Bergamotene	20.78*	1402	[5.17]	0.67	1516	9.61	Sesquiterpene
trans-α-Bergamotene	22.25	1420	0.63	[5.97]	1524	9.91*	Sesquiterpene
6,9-Guaiadiene	22.67	1425	0.17	[0.24]	1540	10.47*	Sesquiterpene
Italidione I	23.38	1433	2.12	5.85	1803	24.55*	β-diketone
α-Humulene	23.50	1435	0.18	0.37	1587	12.21*	Sesquiterpene
allo-Aromadendrene	23.75	1438	0.08	0.08	1550	10.84	Sesquiterpene
α-Acoradiene	24.30	1444	0.33	[0.37]	1587	12.21*	Sesquiterpene
trans-β-Farnesene	24.64*	1448	0.49	[0.86]	1616	13.43*	Sesquiterpene
β-Acoradiene	24.64*	1448	[0.49]	0.28	1593	12.41	Sesquiterpene
Neryl propionate	24.89	1451	0.49	[0.82]	1730	19.66*	Monoterp. ester
γ-Selinene	25.26	1456	1.28	[1.76]	1604	12.83*	Sesquiterpene
Germacrene D	25.60	1460	0.19	[18.71]	1633	14.31*	Sesquiterpene
α-Amorphene	25.92	1464	0.33	[0.86]	1616	13.43*	Sesquiterpene
γ-Curcumene	26.46	1470	14.11	[18.71]	1633	14.31*	Sesquiterpene
Italidione isomer	26.60*	1472	4.99	[5.85]	1803	24.55*	β-diketone
β-Selinene	26.60*	1472	[4.99]	[18.71]	1633	14.31*	Sesquiterpene
ar-Curcumene	26.84	1475	1.33	[1.32]	1702	17.92*	Sesquiterpene
Italidione II	27.12*	1478	4.96	[5.85]	1803	24.55*	β-diketone
α-Selinene	27.12*	1478	[4.96]	3.57	1640	14.65*	Sesquiterpene
α-Muurolene	27.81	1486	0.28	[3.57]	1640	14.65*	Sesquiterpene
δ-Amorphene	27.94	1488	0.34	[3.57]	1640	14.65*	Sesquiterpene

γ -Cadinene	28.85	1499	0.37	0.42	1674	16.48*	Sesquiterpene
β -Bisabolene	29.02*	1501	0.65	[4.60]	1664	15.96*	Sesquiterpene
Italidione II isomer	29.02*	1501	[0.65]	[5.85]	1803	24.55*	β -diketone
β -Curcumene	29.15	1503	0.38	[0.42]	1674	16.48*	Sesquiterpene
δ -Cadinene	29.51	1508	0.73	0.82	1679	16.72*	Sesquiterpene
<i>trans</i> - γ -Bisabolene	30.30	1519	0.20	[0.82]	1679	16.72*	Sesquiterpene
β -Sesquiphellandrene	30.65	1524	0.12	[1.32]	1702	17.92*	Sesquiterpene
<i>trans</i> - α -Bisabolene	31.96	1542	0.06	[1.32]	1702	17.92*	Sesquiterpene
Italicene ether	32.26	1547	0.08				Sesquiterp. ether
Caryophyllene oxide	33.91*	1570	0.48	0.07	1849	27.86	Sesquiterp. ether
Italidione III	33.91*	1570	[0.48]	[5.85]	1803	24.55*	β -diketone
Italidione III isomer	34.18	1574	0.16				β -diketone
Italidione III isomer II	34.27	1575	0.14				β -diketone
Italidione III isomer III	34.46	1578	0.11				β -diketone
Guaiol	35.44	1591	0.07	0.08	2002	36.61	Sesquiterp. alcohol
Copaborneol	35.88	1598	0.22				Sesquiterp. alcohol
Rosifoliol analog?	36.09	1602	0.18	0.11	2013	37.08	Sesquiterp. alcohol
Neryl angelate?	37.05	1626	0.10				Monoterp. ester
β -Eudesmol	37.98	1649	0.06	0.10	2111	40.17	Sesquiterp. alcohol
Selin-11-en-4- α -ol	38.14	1653	0.15	0.16	2135	40.84	Sesquiterp. alcohol
Unknown dione (m/z = 98, 41 (50), 83 (46), 82 (43), 137 (43)... 202 (5), 220 (3), 238 (1), 281 (2))	42.96	1792	0.12				β -diketone
Total identified			97.79%	97.04%			

*: 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

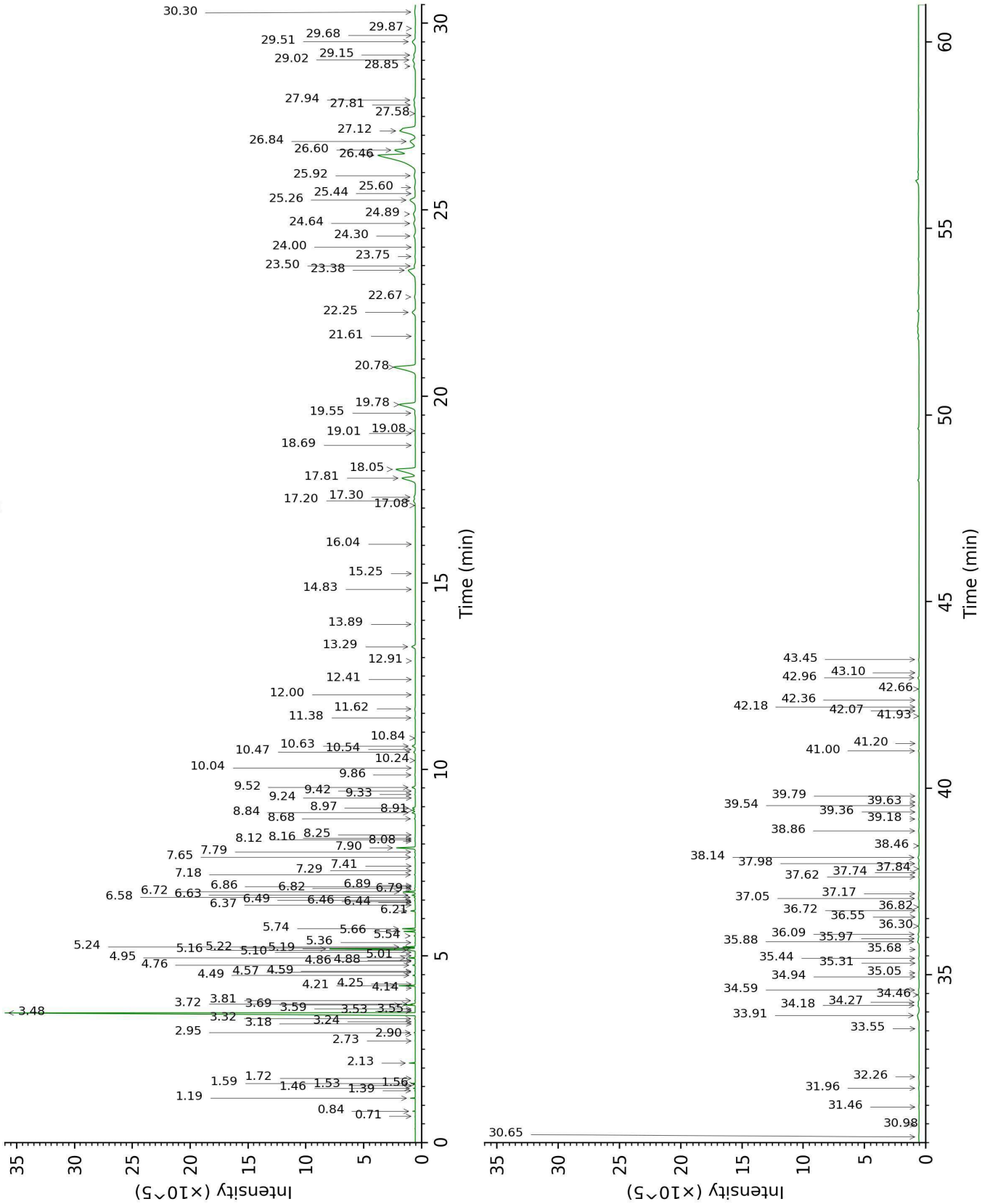
Physical aspect : Faintly yellow liquid

Refractive index : 1.4783 \pm 0.0003 (20 °C)

CONCLUSION

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

17J17-PTH1-1-CC_BP5



17J17-PTH1-1-CC_WAX

