

## GC/MS BATCH NUMBER: C40102

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**ESSENTIAL OIL:** CARROT SEED

**BOTANICAL NAME:** DAUCUS CAROTA

**ORIGIN:** INDIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF CARROT SEED OIL	%
CAROTOL	74.7
DAUCOL	2.8
DAUCENE	2.7
$\beta$ -BISABOLENE	1.8
trans- $\beta$ -FARNESENE	1.5

Comments from Robert Tisserand: This is a good quality Indian Carrot seed oil, and has a substantial percentage of the major constituent, carotol.

**Date :** March 11, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16C01-PTH1-1-HM

**Customer identification :** Carrot Seed - India - C4010257s1R

**Type :** Essential oil

**Source :** *Daucus carota*

**Customer :** Plant Therapy


*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 :** 2016-03-07

Checked and approved by :



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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.	
Hexanal	1.33	805	tr	0.01	1028	1.29	Aliphatic aldehyde
$\alpha$ -Pinene	2.80	923	0.44	0.45	944	0.93	Monoterpene
Camphene	3.07	940	0.04	0.03	1012	1.17	Monoterpene
Thuja-2,4(10)-diene	3.16	946	0.02	0.06	1067	1.61*	Monoterpene
Sabinene	3.48	967	0.04	[0.06]	1067	1.61*	Monoterpene
$\beta$ -Pinene	3.53	969	0.27	0.26	1049	1.47	Monoterpene
Myrcene	3.84	989	0.33	0.33	1120	2.12	Monoterpene
Limonene	4.47*	1026	0.31	0.25	1144	2.40	Monoterpene
para-Cymene	4.47*	1026	[0.31]	0.05	1213	3.24	Monoterpene
$\beta$ -Phellandrene	4.47*	1026	[0.31]	0.01	1150	2.48	Monoterpene
para-Cymenene	5.70	1096	0.02	0.02	1373	5.55	Monoterpene
<i>trans</i> -Sabinene hydrate	5.98	1108	0.07	0.02	1500	7.80	Monoterp. alcohol
Linalool	6.07	1112	0.02	0.03	1512	8.12	Monoterp. alcohol
<i>cis</i> -para-Menth-2-en-1-ol	6.36	1125	0.01	0.01	1510	8.04	Monoterp. alcohol
<i>trans</i> -Pinocarveol	6.66	1139	0.04	0.04	1577	10.06	Monoterp. alcohol
<i>trans</i> -para-Menth-2-en-1-ol	6.83	1147	0.02	0.02	1564	9.66	Monoterp. alcohol
(2E)-Nonenal	7.19	1163	0.03				Aliphatic aldehyde
Myrtenal	7.97	1198	0.04	0.05	1534	8.79	Monoterp. aldehyde
Verbenone	8.40	1209	0.01	0.03	1610	11.14	Monoterp. ketone
Neral	9.71	1244	0.03	0.02	1612	11.20	Monoterp. aldehyde
Geranial	10.89	1276	0.02	1.82	1659	13.28*	Monoterp. aldehyde
Daucene	15.08	1355	2.70	2.63	1434	6.58	Sesquiterpene
Unknown (m/z = 159, 177 (73), 93 (73), 107 (67), 91 (57)... 220? (6))	15.18	1357	0.14				Oxygenated sesquiterpene
Daucene isomer	15.56	1364	0.38	0.37	1488	7.59	Sesquiterpene
$\beta$ -Caryophyllene	17.39	1396	0.52	0.57	1520	8.35	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	18.85	1415	0.59	0.62	1527	8.56	Sesquiterpene
<i>cis</i> - $\beta$ -Farnesene	19.31	1421	0.09	0.10	1583	10.25	Sesquiterpene
Acora-3,9-diene?	20.39	1435	0.23				
<i>trans</i> - $\beta$ -Farnesene	21.12	1445	1.47	1.32	1618	11.47	Sesquiterpene
Dehydroaromadendrene	21.26	1446	0.55	0.59	1607	10.97	Sesquiterpene
ar-Curcumene	23.00	1469	0.13	0.12	1697	14.97	Sesquiterpene
Isodaucene	23.33	1473	0.81	0.78	1635	12.22	Sesquiterpene
Germacrene A	24.00	1482	0.21	0.22	1690	14.64	Sesquiterpene
$\beta$ -Bisabolene	25.07	1495	1.84	[1.82]	1659	13.28*	Sesquiterpene
Dauca-4(11),8-diene	26.31	1510	0.16				Sesquiterpene
Methyl (E)-isoeugenol	26.51	1512	0.34	0.39	2101	38.03	Phenylpropanoid
Unknown (m/z = 135, 159 (98), 107 (92), 177 (86), 121 (86), 91 (80)... 220 (23))	29.46	1548	1.59	4.28	1938	30.24*	Oxygenated sesquiterpene

Caryophyllene oxide	30.26	1557	0.54	0.52	1850	24.28	Sesquiterp. ether
Carotol	33.09*	1591	79.26	74.72	1923	29.32	Sesquiterp. alcohol
Unknown, not seen in MS (carrot)	33.09*	1591	[79.26]	[4.28]	1938	30.24*	Oxygenated sesquiterpene
10-epi- $\gamma$ -Eudesmol	33.41	1595	0.04	0.04	1986	33.26	Sesquiterp. alcohol
Muurolo-4,10(14)-dien-1- $\beta$ -ol analog?	33.86	1604	0.35				Sesquiterp. alcohol
Muurolo-4,10(14)-dien-1- $\beta$ -ol?	34.19	1611	0.20				Sesquiterp. alcohol
$\gamma$ -Eudesmol	34.91	1626	0.07	0.08	2076	37.11	Sesquiterp. alcohol
Daucol	35.51	1639	2.79	2.73	2188	40.52	Sesquiterp. alcohol
Unknown (m/z = 59, 95 (64), 93 (44), 107 (41)... 204 (29), 207? (24))	36.53	1660	0.51				Oxygenated sesquiterpene
Drimenol	40.40	1759	0.12	0.15	2367	44.75	Sesquiterp. alcohol
Heptanal	2.57	910	0.01	0.01	1133	2.27	Aliphatic aldehyde
<b>Total identified</b>			<b>95.16%</b>	<b>93.75%</b>			

\*: 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 :** Yellow liquid

**Refractive index :** 1.4933  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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

