

# Ravensara Essential Oil

Laboratoire  
**Phyto**Chemia





Date : July 11, 2017

## SAMPLE IDENTIFICATION

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Customer I

Type : Essai

Source : Ra

Customer :

## ANALYSIS

Method : P

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Analyst : S)

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Checked an

Note: This re

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This report is

Essential oil, Ravensara aromatica  
Internal Code: 17G04-FSE9-1-DM

Customer Identification:  
Ravensara - South Africa - RAVA0514PFE

Report prepared for  
Flowers Shining Everywhere Inc.

## IDENTIFIED COMPOUNDS

Identification	Column: BPS			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Tricyclene	3.24	918	0.02	0.02	923	0.94	Monoterpene
α-Thujene	3.33	924	1.13	1.67	954	1.07	Monoterpene
α-Pinene	3.45	931	6.31	5.84	947	1.04	Monoterpene
Camphene	3.72*	947	1.61	1.58	1000	1.28	Monoterpene
α-Fenchene	3.72*	947	[1.61]	0.07	989	1.23	Monoterpene
Sabinene	4.24	975	17.62	17.83	1064	1.80	Monoterpene
β-Pinene	4.24	978	3.47	3.42	1044	1.61	Monoterpene
Myrcene	4.51	994	3.77	4.01	1118	2.31	Monoterpene
2-Carene	4.72	1006	0.03	4.66	1091	2.06*	Monoterpene
Δ3-Carene	4.80*	1010	6.82	[4.66]	1091	2.06*	Monoterpene
α-Phellandrene	4.80*	1010	[6.82]	2.31	1108	2.23	Monoterpene
meta-Cymene	4.96	1019	0.99	1.11	1123	2.38	Monoterpene
Limonene	5.24*	1034	15.69	14.18	1145	2.66	Monoterpene
para-Cymene	5.24*	1034	[15.69]	1.52	1205	3.43	Monoterpene
β-Phellandrene	5.25	1035	1.47	2.89	1148	2.70*	Monoterpene
1,8-Cineole	5.27	1036	0.96	[2.89]	1148	2.70*	Monoterp. ether
cis-β-Ocimene	5.37	1042	0.82	2.24	1187	3.19*	Monoterpene
Heptan-2-yl acetate	5.46	1046	0.06				Aliphatic ester
trans-β-Ocimene	5.55	1051	0.13	0.07	1199	3.37	Monoterpene
γ-Terpinene	5.74	1062	1.41	[2.24]	1187	3.19*	Monoterpene
cis-Sabinene hydrate	6.06	1079	0.08	0.10	1401	6.31	Monoterp. alcohol
Terpinolene	6.22	1088	0.51	0.51	1223	1.85	Monoterpene
Linalool	6.72	1110	2.54	2.59	1488	8.10*	Monoterp. alcohol
cis-para-Menth-2-en-1-ol	7.23	1129	0.11	[2.59]	1488	8.10*	Monoterp. alcohol
trans-para-Menth-2-en-1-ol	7.74	1147	0.07	0.10	1554	9.88	Monoterp. alcohol
Borneol	8.65	1181	0.25	0.76	1613	12.01*	Monoterp. alcohol
Terpinen-4-ol	8.85	1188	3.57	3.57	1529	9.06	Monoterp. alcohol
para-Cymen-8-ol	9.35	1204	0.08	0.05	1764	19.53	Monoterp. alcohol
α-Terpineol	9.47	1207	0.37	8.26	1629	12.56*	Monoterp. alcohol
Methylchavicol	9.50	1207	0.51	0.55	1565	10.23	Phenylpropanoid
α-Phellandrene epoxide	9.72	1212	0.03	0.01	1715	16.78	Monoterpene
trans-Piperitol	9.95	1217	0.05	0.48	1668	14.34*	Monoterp. alcohol
trans-Carveol	10.43	1228	0.03				Monoterp. alcohol
Bornyl acetate	12.94	1283	0.43	0.47	1500	8.37	Monoterp. ester
Dihydroedulan I	13.12	1287	0.09	0.11	1446	7.11	Eduan
δ-Eudesmol	15.37	1326	0.57	0.57	1422	6.62	Sesquiterpene
α-Terpinyl acetate	16.03	1336	0.38	[0.76]	1613	12.01*	Monoterp. ester
α-Cubebene	16.69	1346	0.26	0.34	1410	6.45	Sesquiterpene
α-Yangene	17.30	1355	0.06	0.05	1431	6.78	Sesquiterpene
Eugenol	17.61	1360	0.06	0.09	2026	35.66	Phenylpropanoid
α-Copaene	17.78	1362	1.16	1.18	1439	6.94	Sesquiterpene

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Plus que des analyses... des conseils

Page 2 of 6



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Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Tricyclene	3.24	918	0.02	0.02	923	0.94	Monoterpene
$\alpha$ -Thujene	3.33	924	1.13	1.67	954	1.07	Monoterpene
$\alpha$ -Pinene	3.45	931	6.31	5.84	947	1.04	Monoterpene
Camphene	3.72*	947	1.61	1.58	1000	1.28	Monoterpene
$\alpha$ -Fenchene	3.72*	947	[1.61]	0.07	989	1.23	Monoterpene
Sabinene	4.24	975	17.62	17.83	1064	1.80	Monoterpene
$\beta$ -Pinene	4.24	978	3.47	3.42	1044	1.61	Monoterpene
Myrcene	4.51	994	3.77	4.01	1118	2.31	Monoterpene
2-Carene	4.72	1006	0.03	4.66	1091	2.06*	Monoterpene
$\Delta^3$ -Carene	4.80*	1010	6.82	[4.66]	1091	2.06*	Monoterpene
$\alpha$ -Phellandrene	4.80*	1010	[6.82]	2.31	1108	2.23	Monoterpene
meta-Cymene	4.96	1019	0.99	1.11	1123	2.38	Monoterpene
Limonene	5.24*	1034	15.69	14.18	1145	2.66	Monoterpene
para-Cymene	5.24*	1034	[15.69]	1.52	1205	3.43	Monoterpene
$\beta$ -Phellandrene	5.25	1035	1.47	2.89	1148	2.70*	Monoterpene
1,8-Cineole	5.27	1036	0.96	[2.89]	1148	2.70*	Monoterp. ether
cis- $\beta$ -Ocimene	5.37	1042	0.82	2.24	1187	3.19*	Monoterpene
Heptan-2-yl acetate	5.46	1046	0.06				Aliphatic ester
trans- $\beta$ -Ocimene	5.55	1051	0.13	0.07	1199	3.37	Monoterpene
$\gamma$ -Terpinene	5.74	1062	1.41	[2.24]	1187	3.19*	Monoterpene
cis-Sabinene hydrate	6.06	1079	0.08	0.10	1401	6.31	Monoterp. alcohol
Terpinolene	6.22	1088	0.51	0.51	1223		Monoterpene
Linalool	6.72	1110	2.54	2.59	1488	8.10*	Monoterp. alcohol
cis-para-Menth-2-en-1-ol	7.23	1129	0.11	[2.59]	1488	8.10*	Monoterp. alcohol
trans-para-Menth-2-en-1-ol	7.74	1147	0.07	0.10	1554	9.88	Monoterp. alcohol
Borneol	8.65	1181	0.25	0.76	1613	12.01*	Monoterp. alcohol
Terpinen-4-ol	8.85	1188	3.57	3.57	1529	9.06	Monoterp. alcohol
para-Cymen-8-ol	9.35	1204	0.08	6.05	1764	19.53	Monoterp. alcohol
$\alpha$ -Terpineol	9.47	1207	0.37	8.26	1629	12.56*	Monoterp. alcohol
Methylchavicol	9.50	1207	0.51	0.55	1565	10.23	Phenylpropanoid
$\alpha$ -Phellandrene epoxide	9.72	1212	0.03	0.01	1715	16.78	Monoterpene
trans-Piperitol	9.95	1217	0.05	0.48	1668	14.34*	Monoterp. alcohol
trans-Carveol	10.43	1228	0.03				Monoterp. alcohol
Bornyl acetate	12.94	1283	0.43	0.47	1500	8.37	Monoterp. ester
Dihydroedulan I	13.12	1287	0.09	0.11	1446	7.11	Edulan
$\delta$ -Elemene	15.37	1326	0.57	0.57	1422	6.62	Sesquiterpene
$\alpha$ -Terpinyl acetate	16.03	1336	0.38	[0.76]	1613	12.01*	Monoterp. ester
$\alpha$ -Cubebene	16.69	1346	0.26	0.34	1410	6.45	Sesquiterpene
$\alpha$ -Ylangene	17.30	1355	0.06	0.05	1431	6.78	Sesquiterpene
Eugenol	17.61	1360	0.06	0.09	2026	35.66	Phenylpropanoid
$\alpha$ -Copaene	17.78	1362	1.16	1.18	1439	6.94	Sesquiterpene

$\beta$ -Bourbonene	18.18	1368	0.07	0.09	1457	7.35	Sesquiterpene
$\beta$ -Cubebene	18.74	1377	0.52	0.58	1477	7.83	Sesquiterpene
$\beta$ -Elemene	18.99	1381	0.72	5.90	1527	9.01*	Sesquiterpene
$\beta$ -Caryophyllene*	20.76	1406	5.03	[5.90]	1527	9.01*	Sesquiterpene
Methyleugenol	21.69	1417	1.56	1.51	1931	30.85	Phenylpropanoid
$\alpha$ -Humulene	23.48	1439	1.25	1.26	1584	10.92	Sesquiterpene
9-epi- $\beta$ -Caryophyllene	23.73	1442	0.57	[0.48]	1668	14.34*	Sesquiterpene
$\gamma$ -Murolene	25.15	1459	0.06	0.03	1597	11.43	Sesquiterpene
Germacrene D	25.85	1467	7.65	[8.26]	1629	12.56*	Sesquiterpene
$\beta$ -Selinene	26.31	1473	0.11	[8.26]	1629	12.56*	Sesquiterpene
4-epi-Cubebol	26.93*	1480	0.34	0.17	1806	22.23	Sesquiterp. alcohol
Bicyclogermacrene	26.93*	1480	[0.34]	0.25	1647	13.29	Sesquiterpene
$\alpha$ -Murolene	27.51	1487	0.19	0.12	1651	13.51	Sesquiterpene
$\gamma$ -Cadinene	28.75	1502	0.16	0.17	1672	14.55	Sesquiterpene
Cubebol	29.24	1509	0.17	0.16	1851	25.15	Sesquiterp. alcohol
$\delta$ -Cadinene	29.43	1512	0.89	0.91	1677	14.83	Sesquiterpene
$\alpha$ -Elemol	32.65	1557	0.91	0.94	2000	34.56	Sesquiterp. alcohol
*Elemidin	33.86*	1573	0.89	0.60	2141	39.66	Phenylpropanoid
Caryophyllene oxide	33.86*	1573	[0.89]	0.12	1857	25.51	Sesquiterp. ether
Guaiol	35.34	1594	0.10	0.14	2008	34.87	Sesquiterp. alcohol
$\gamma$ -Eudesmol	37.01	1630	0.37	0.21	2065	37.38	Sesquiterp. alcohol
$\tau$ -Cadinol	37.52	1643	0.07	0.08	2071	37.52	Sesquiterp. alcohol
$\tau$ -Murolol	37.64	1646	0.08	0.09	2087	38.05	Sesquiterp. alcohol
$\beta$ -Eudesmol	37.88	1652	0.41	0.37	2113	38.82	Sesquiterp. alcohol
$\alpha$ -Eudesmol	38.08	1657	0.29	0.23	2127	39.26	Sesquiterp. alcohol
Cryptomeridiol	43.65	1823	0.12	0.12	2598	49.89	Sesquiterp. alcohol
<b>Total identified</b>			<b>95.44%</b>	<b>96.73%</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:**  $1.4805 \pm 0.0003$  (20 °C)

#### CONCLUSION

No adulterant, contaminant or diluent were detected using this method. This sample, although containing a bit less methylchavicol, would correspond to the "group 3" chemotype defined by Andrianoelisoa et al<sup>1</sup>.

#### REFERENCE

- (1) Andrianoelisoa, H. S.; Menut, C.; de Chatelperron, P. C.; Saracco, J.; Ramadoss, P.; Danthu, P. Intraspecific Chemical Variability and Highlighting of Chemotypes of Leaf Essential Oils from Ravensara Aromatica Sonnerat, a Tree Endemic to Madagascar. *Flavour Fragr. J.* **2006**, *21* (5), 833-838.



