

GC/MS BATCH NUMBER: R10104

ESSENTIAL OIL: RAVENSARA
BOTANICAL NAME: RAVENSARA AROMATICA
ORIGIN: MADAGASCAR

KEY CONSTITUENTS PRESENT IN THIS BATCH OF RAVENSARA OIL	%
SABINENE	14.0
LIMONENE	13.8
GERMACRENE D	6.8
Δ^3 -CARENE	5.4
LINALOOL	5.2
α -PINENE	5.2
METHYLEUGENOL	5.1
β -CARYOPHYLLENE	4.6
MYRCENE	4.1
METHYL CHAVICOL (ESTRAGOLE)	3.1
β -PINENE	2.8
α -PHELLANDRENE	2.8
α -TERPINENE	2.0
γ -TERPINENE	1.7
cis- β -OCIMENE	1.4
CAMPHENE	1.2
δ -CADINENE	1.2
1,8-CINEOLE	1.01

Comments from Robert Tisserand:
Has a penetrating, sharp-fresh odor.
Constituents look typical.

Date : April 5, 2016

SAMPLE IDENTIFICATION

Internal code : 16C24-PTH7-1-DM

Customer identification : Ravensara - Madagascar - R1010457R

Type : Essential oil

Source : *Ravensara aromatica*

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 : 2016-04-02

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.	
α -Thujene	3.08	921	0.98	1.06	962	0.95	Monoterpene
α -Pinene	3.19	927	5.21	5.19	955	0.92	Monoterpene
Camphene	3.46*	943	1.31	1.23	1007	1.15	Monoterpene
α -Fenchene	3.46*	943	[1.31]	0.07	999	1.10	Monoterpene
Sabinene	3.91	971	14.00	14.14	1067	1.63	Monoterpene
β -Pinene	3.96	974	2.81	2.81	1046	1.46	Monoterpene
Myrcene	4.23	991	4.08	4.19	1122	2.12	Monoterpene
2-Carene	4.32	997	0.01	0.02	1077	1.70	Monoterpene
Δ 3-Carene	4.51*	1007	8.21	5.42	1099	1.88	Monoterpene
α -Phellandrene	4.51*	1007	[8.21]	2.81	1114	2.04	Monoterpene
Pseudolimonene	4.53	1009	0.76	0.71	1119	2.08	Monoterpene
α -Terpinene	4.67	1017	1.95	1.93	1128	2.19	Monoterpene
meta-Cymene	4.75	1021	0.10				Monoterpene
para-Cymene	4.85	1027	0.34	0.58	1215	3.21	Monoterpene
Limonene	4.93†	1031	15.50	13.79	1149	2.44	Monoterpene
β -Phellandrene	4.94†	1032	[15.50]	2.89	1153	2.49*	Monoterpene
1,8-Cineole	4.97	1034	1.07	[2.89]	1153	2.49*	Monoterp. ether
cis- β -Ocimene	5.08	1040	1.35	1.24	1195	2.98	Monoterpene
trans- β -Ocimene	5.25	1049	0.18	0.18	1209	3.13	Monoterpene
γ -Terpinene	5.43	1060	1.66	1.80	1194	2.96	Monoterpene
cis-Linalool oxide (fur.)	5.73	1076	0.01	0.02	1389	5.68	Monoterp. alcohol
cis-Sabinene hydrate	5.74	1077	0.22	0.35	1417	6.12*	Monoterp. alcohol
Terpinolene	5.89	1085	0.59	0.58	1229	3.42	Monoterpene
Linalool	6.35*	1108	5.21	5.26	1508	7.86*	Monoterp. alcohol
trans-Sabinene hydrate	6.35*	1108	[5.21]	0.16	1493	7.55	Monoterp. alcohol
cis-para-Menth-2-en-1-ol	6.80	1126	0.16	[5.26]	1508	7.86*	Monoterp. alcohol
trans-para-Menth-2-en-1-ol	7.25	1144	0.08	0.08	1558	9.30	Monoterp. alcohol
Borneol	8.02	1174	0.27	0.25	1624	11.39	Monoterp. alcohol
Terpinen-4-ol	8.24	1183	3.11	3.12	1538	8.70	Monoterp. alcohol
Methylchavicol	8.85*	1205	2.82	3.10	1590	10.28*	Phenylpropanoid
α -Terpineol	8.85*	1205	[2.82]	0.48	1634	11.84*	Monoterp. alcohol
Bornyl acetate	12.09	1281	0.29	0.37	1514	7.98	Monoterp. ester
Dihydroedulan I	12.20	1284	0.11	0.12	1450	6.74	Edulan
Bicycloelemene	14.32	1324	0.42	0.42	1424	6.25	Sesquiterpene
α -Cubebene	14.94	1334	0.35	0.22	1416	6.10	Sesquiterpene
α -Terpinyl acetate	15.55	1344	0.19	0.25	1619	11.18	Monoterp. ester
α -Ylangene	16.17	1354	0.18	[0.35]	1417	6.12*	Sesquiterpene
α -Copaene	16.55	1360	1.17	1.20	1439	6.53	Sesquiterpene
β -Cubebene	17.47	1375	0.55	0.60	1483	7.36	Sesquiterpene
β -Elemene	17.68	1378	0.43	0.50	1531	8.47	Sesquiterpene
β -Caryophyllene	19.32	1404	4.62	4.68	1529	8.42	Sesquiterpene

Methyleugenol	20.26	1416	5.13	4.91	1943	30.11	Phenylpropanoid
α-Humulene	21.90	1436	0.94	[3.10]	1590	10.28*	Sesquiterpene
allo-Aromadendrene	22.15	1439	0.41	0.53	1567	9.55	Sesquiterpene
γ-Murolene	23.54	1456	0.06	0.03	1613	10.96	Sesquiterpene
Germacrene D	24.15	1463	6.76	7.02	1630	11.68	Sesquiterpene
β-Selinene	24.77	1471	0.18	[0.48]	1634	11.84*	Sesquiterpene
Bicyclogermacrene	25.21*	1476	0.38	0.27	1647	12.43	Sesquiterpene
α-Selinene	25.21*	1476	[0.38]	0.10	1638	12.05	Sesquiterpene
4-epi-Cubebol	25.75	1483	0.12	0.11	1811	21.11	Sesquiterp. alcohol
Valencene	26.09*	1487	0.62	0.43	1669	13.41	Sesquiterpene
α-Murolene	26.09*	1487	[0.62]	0.11	1651	12.61	Sesquiterpene
γ-Cadinene	26.94	1497	0.20	0.17	1673	13.61	Sesquiterpene
Cubebol	27.43	1503	0.08	0.08	1858	24.35	Sesquiterp. alcohol
δ-Cadinene	27.63	1506	1.16	1.21	1680	13.91	Sesquiterpene
trans-Calamenene	27.88	1509	0.10	0.12	1726	16.10	Sesquiterpene
trans-Cadina-1,4-diene	28.65	1519	0.07	0.08	1696	14.67	Sesquiterpene
α-Elemol	30.82	1548	0.67	0.71	2004	33.77	Sesquiterp. alcohol
Elemicin	32.46	1569	0.62	0.49	2153	39.30	Phenylpropanoid
Guaiol	34.07	1590	0.14	0.16	2009	34.09	Sesquiterp. alcohol
γ-Eudesmol	35.80	1621	0.18	0.15	2074	36.74	Sesquiterp. alcohol
τ-Cadinol	36.41	1635	0.06	0.06	2078	36.88	Sesquiterp. alcohol
τ-Murolol	36.54	1638	0.07	0.06	2093	37.43	Sesquiterp. alcohol
β-Eudesmol	36.77*	1643	0.27	0.13	2117	38.24	Sesquiterp. alcohol
α-Murolol	36.77*	1643	[0.27]	0.13	2114	38.13	Sesquiterp. alcohol
α-Cadinol	37.00	1649	0.13	0.13	2131	38.71	Sesquiterp. alcohol
Total identified			98.65%	99.01%			

*: Two or more compounds are coeluting on this column

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

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

Note: no correction factor was applied

OTHER DATA

Physical aspect : Light yellow liquid

Refractive index : 1.4805 ± 0.0003 (20 °C)

CONCLUSION

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



