

Analysis Nerolina Essential Oil

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CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION 

Internal code : 18I25-FSE12-1-CC

Customer identification : Nerolina - Australia - EA120618

Type : Essential oil

Source : *Melaleuca quinquenervia* ct. Nerolina (linalool/nerolidol)

Customer : Flowers Shining Everywhere Inc.



ANALYSIS

Method: PC-PA-014-17J19 - Analysis of the composition of an essential oil, or other volatile liquid, by FAST GC-FID (in French); identifications validated by GC-MS.

Analyst : Lindsay Girard, B. Sc.

Analysis date : September 27, 2018



Checked and approved by :



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

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PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid
Refractive index: 1.4693 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.



ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Ethanol	0.48	0.60	Aliphatic alcohol
Isobutyral	0.03	0.04	Aliphatic aldehyde
2-Methyl-3-buten-2-ol	0.02	0.01	Aliphatic alcohol
Isovaleral	0.03	0.03	Aliphatic aldehyde
2-Methylbutyral	0.02	0.02	Aliphatic aldehyde
2-Pentanone	0.02	0.03	Aliphatic ketone
Isoamyl alcohol	0.01	0.07*	Aliphatic alcohol
2-Methylbutanol	tr	[0.07]*	Aliphatic alcohol
Methyl 2-methylbutyrate	0.01	0.02*	Aliphatic ester
Octene	0.01	tr	Alkene
Hexanal	0.01	0.01	Aliphatic aldehyde
(3Z)-Hexenol	0.16	0.18	Aliphatic alcohol
Hexanol	0.03	0.03	Aliphatic alcohol
Nonene	0.11	0.11	Alkene
Tricyclene	0.01	[0.02]*	Monoterpene
α -Thujene	0.01	tr	Monoterpene
α -Pinene	0.36	0.35	Monoterpene
Camphene	0.01	0.02	Monoterpene
Benzaldehyde	0.45	0.43*	Simple phenolic
Geranic oxide	0.01	0.01	Monoterpenic ether
Sabinene	0.06*	0.01	Monoterpene
β -Pinene	[0.06]*	0.06	Monoterpene
6-Methyl-5-hepten-2-one	0.08	0.08	Aliphatic ketone
trans-Dehydroxylinalool oxide	0.07	[0.07]*	Monoterpenic ether
Myrcene	0.04	0.04	Monoterpene
6-Methyl-5-hepten-2-ol	0.03	0.04	Aliphatic alcohol
α -Phellandrene	0.02	0.02	Monoterpene
cis-Dehydroxylinalool oxide	0.06	0.06	Monoterpenic ether
1,4-Cineole	0.01	0.07*	Monoterpenic ether
α -Terpinene	0.06	[0.07]*	Monoterpene
para-Cymene	0.10	0.11	Monoterpene
Limonene	0.82*	0.22	Monoterpene
1,8-Cineole	[0.82]*	0.58*	Monoterpenic ether
β -Phellandrene	[0.82]*	[0.58]*	Monoterpene
(Z)- β -Ocimene	0.10	0.10	Monoterpene
(E)- β -Ocimene	0.26	0.26	Monoterpene
γ -Terpinene	0.14	0.14	Monoterpene
cis-Linalool oxide (fur.)	0.31	0.30	Monoterpenic alcohol
Octanol	0.01	0.01*	Aliphatic alcohol
Terpinolene	0.39*	0.07	Monoterpene
trans-Linalool oxide (fur.)	[0.39]*	0.31	Monoterpenic alcohol
Linalool	39.47	39.87	Monoterpenic alcohol
trans-Pinocarveol	0.02	0.02	Monoterpenic alcohol
Isopulegol	0.01	[0.01]*	Monoterpenic alcohol
Nerol oxide	0.01	0.01	Aliphatic ether
Isoneral	0.01	0.01	Monoterpenic aldehyde
cis-Linalool oxide (pyr.)	0.04*	0.05	Monoterpenic alcohol
Borneol	[0.04]*	0.68*	Monoterpenic alcohol

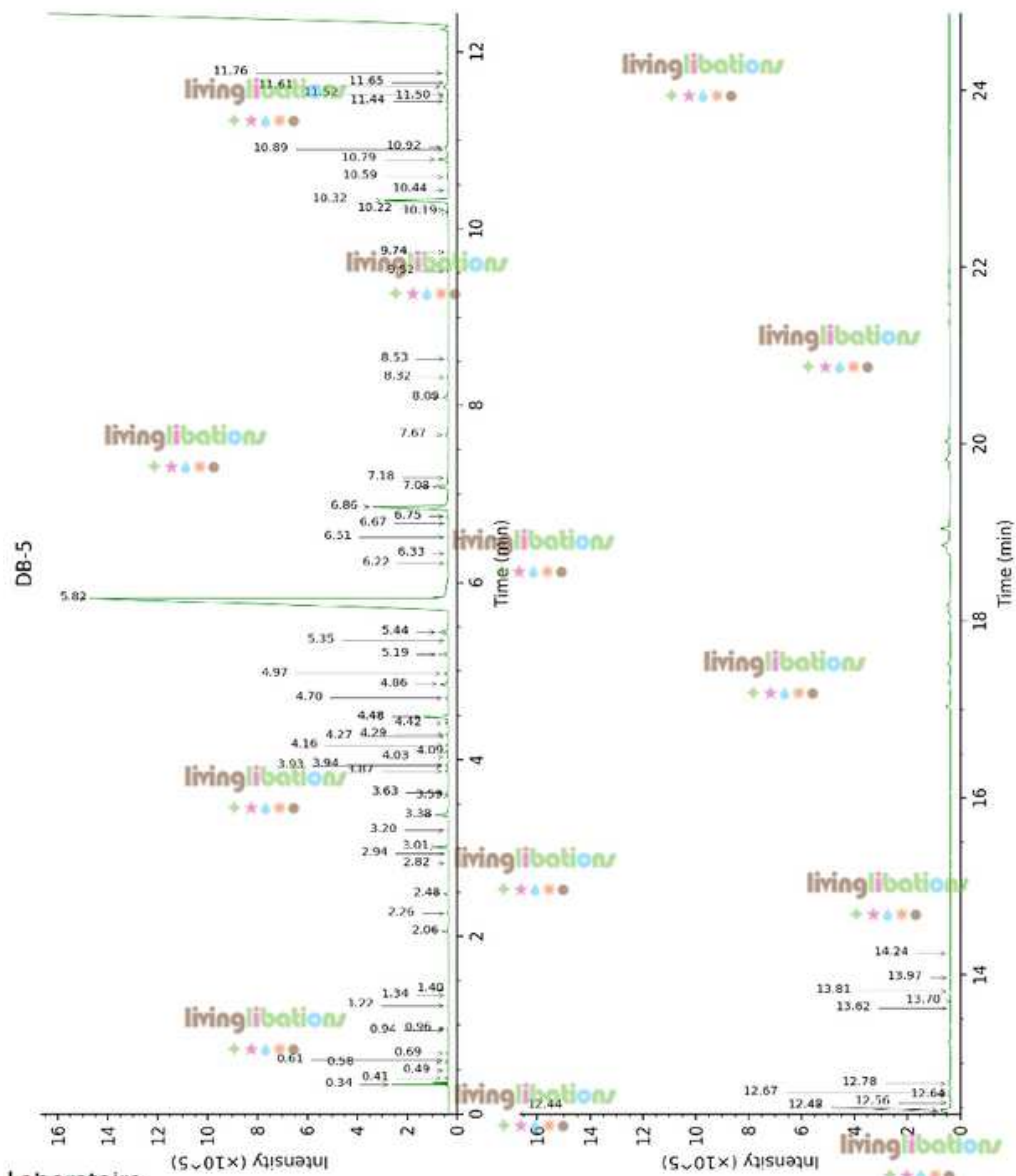
Terpinen-4-ol	3.24*	3.14	Monoterpenic alcohol
<i>trans</i> -Linalool oxide (pyr.)	[3.24]*	0.22*	Monoterpenic alcohol
α -Terpineol	0.60	[0.68]*	Monoterpenic alcohol
Hodiendiol	0.02	0.30*	Monoterpenic alcohol
Nerol	0.09	0.11	Monoterpenic alcohol
Geraniol	0.24	0.23	Monoterpenic alcohol
Unknown	0.02	0.02	Unknown
Methyl thiobenzoate?	0.02		Simple phenolic
Eugenol	0.04	0.05	Phenylpropanoid
Hodiendiol derivative III	0.01*		Oxygenated monoterpene
α -Copaene	[0.01]*	[0.43]*	Sesquiterpene
Methyleugenol	0.01		Phenylpropanoid
Isocaryophyllene	0.02	0.03*	Sesquiterpene
β -Caryophyllene	2.52	2.49	Sesquiterpene
<i>cis</i> - α -Bergamotene	0.01	[0.03]*	Sesquiterpene
Aromadendrene	0.06	0.05	Sesquiterpene
α -Humulene	0.40	0.38	Sesquiterpene
Cabreuva oxide A?	0.10		Sesquiterpenic ether
allo-Aromadendrene	0.16	0.04	Sesquiterpene
(3Z,6E)- α -Farnesene	0.09	0.17*	Sesquiterpene
Unknown	0.01	0.02	Sesquiterpene
(Z)- α -Bisabolene	0.04	0.05	Sesquiterpene
β -Bisabolene	0.30*	[0.17]*	Sesquiterpene
(3E,6E)- α -Farnesene	[0.30]*	[0.22]*	Sesquiterpene
(Z)- γ -Bisabolene	0.05	0.04	Sesquiterpene
δ -Cadinene	0.13*	0.03	Sesquiterpene
<i>trans</i> -Calamenene	[0.13]*	0.03	Sesquiterpene
(E)-Nerolidol	43.95	43.28	Sesquiterpenic alcohol
Unknown	0.30	0.30	Unknown
Caryophyllene oxide	0.32	[0.30]*	Sesquiterpenic ether
Globulol	0.04	0.07	Sesquiterpenic alcohol
Viridiflorol	0.07	0.08	Sesquiterpenic alcohol
Humulene epoxide I	0.03	0.02	Sesquiterpenic ether
Humulene epoxide II	0.06	0.09	Sesquiterpenic ether
Unknown	0.02		Unknown
(2Z,6Z)-Farnesol	0.02	0.04	Sesquiterpenic alcohol
α -Bisabolol	0.03	0.03	Sesquiterpenic alcohol
Cedroxyde	0.03	0.04	Synthetic
(2E,6E)-Farnesol	0.06	0.08	Sesquiterpenic alcohol
Total identified	96.65%	96.16%	

*: Two or more compounds are coeluting on this column

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

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied



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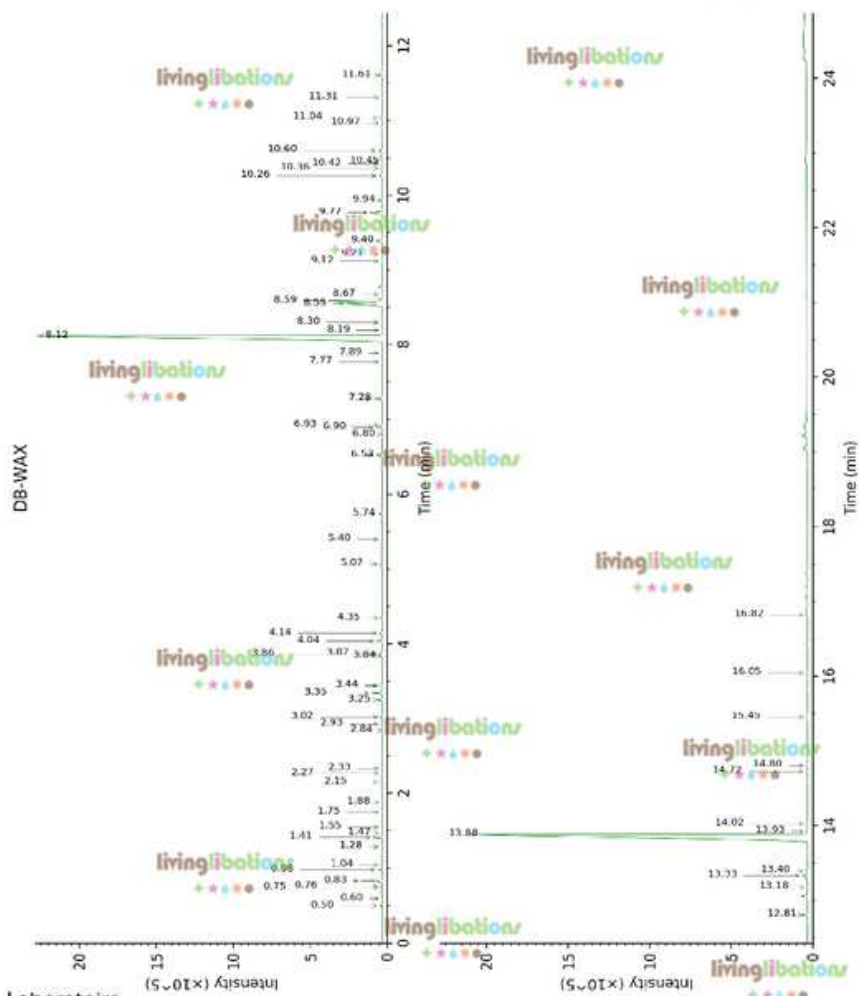
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FULL ANALYSIS DATA

Identification	Column DB-5			livingColumn DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Ethanol	0.34	495	0.48	0.83	904	0.60
Isobutylal	0.41	534	0.03	0.50	775	0.04
2-Methyl-3-buten-2-ol	0.49	604	0.02	1.55	1011	0.01
Isovaleral	0.58	637	0.03	0.76	884	0.03
2-Methylbutylal	0.61	647	0.02	0.75	878	0.02
2-Pentanone	0.68	675	0.02	1.04	938	0.03
Isoamyl alcohol	0.94	728	0.01	3.44*	1177	0.07
2-Methylbutanol	0.96	731	tr	3.44*	1177	[0.07]
Methyl 2-methylbutyrate	1.22	768	0.01	1.28*	977	0.02
Octene	1.34	786	0.01	0.60	824	tr
Hexanal	1.40	795	0.01	1.88	1044	0.01
(3Z)-Hexenol	2.06	852	0.16	5.74	1343	0.18
Hexanol	2.26	870	0.03	5.40	1319	0.03
Nonene	2.48	889	0.11	0.98	928	0.11
Tricyclene	2.82	914	0.01	1.28*	977	[0.02]
α -Thujene	2.94	921	0.01	1.47	1004	tr
α -Pinene	3.01	926	0.36	1.41	997	0.35
Camphene	3.20	939	0.01	1.75	1031	0.02
Benzaldehyde	3.38	950	0.45	7.28*	1456	0.43
Geranic oxide	3.59	965	0.01	2.27	1082	0.01
Sabinene	3.63*	967	0.06	2.33	1088	0.01
β -Pinene	3.63*	967	[0.06]	2.15	1070	0.06
6-Methyl-5-hepten-2-one	3.87	983	0.08	5.07	1295	0.08
trans-Dehydroxylinalool oxide	3.93	988	0.07	3.44*	1177	[0.07]
Myrcene	3.94	988	0.04	2.93	1137	0.04
6-Methyl-5-hepten-2-ol	4.08	994	0.03	6.93	1430	0.04
α -Phellandrene	4.09	998	0.02	2.84	1130	0.02
cis-Dehydroxylinalool oxide	4.16	1003	0.06	3.86	1208	0.06
1,4-Cineole	4.27	1009	0.01	3.02*	1144	0.07
α -Terpinene	4.29	1010	0.06	3.02*	1144	[0.07]
para-Cymene	4.42	1018	0.10	4.14	1228	0.11
Limonene	4.48*	1023	0.82	3.25	1162	0.22
1,8-Cineole	4.48*	1023	[0.82]	3.34*	1169	0.58
β -Phellandrene	4.48*	1023	[0.82]	3.34*	1169	[0.58]
(Z)- β -Ocimene	4.70	1036	0.10	3.84	1207	0.10
(E)- β -Ocimene	4.86	1046	0.26	4.04	1221	0.26
γ -Terpinene	4.97	1053	0.14	3.87	1209	0.14
cis-Linalool oxide (fur.)	5.19	1067	0.31	6.53	1400	0.30
Octanol	5.35	1077	0.01	8.19*	1525	0.01

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<i>trans</i> -Calamenene	11.76*	1517	[0.13]	11.31	1779	0.03
(<i>E</i>)-Nerolidol	12.44	1570	43.95	13.88	2013	43.28
Unknown [m/z 109, 69 (75), 43 (55), 41 (29), 93 (28), 55 (26), 71 (22)...]	12.47	1572	0.30	13.33	1962	0.30
Caryophyllene oxide	12.48	1573	0.32	12.81*	1913	[0.30]
Globulol	12.56	1579	0.04	13.93	2017	0.07
Viridiflorol	12.64	1586	0.07	14.02	2027	0.08
Humulene epoxide I	12.67	1588	0.03	13.18	1947	0.02
Humulene epoxide II	12.78	1596	0.06	13.40	1968	0.09
Unknown [m/z 91, 93 (81), 79 (81), 41 (79), 69 (76), 105 (66)...]	13.62	1666	0.02			
(2 <i>Z</i> ,6 <i>Z</i>)-Farnesol	13.70	1672	0.02	16.04	2229	0.04
α -Bisabolol	13.81	1682	0.03	15.45	2168	0.03
Cedroxyde	13.97	1694	0.03	14.72	2095	0.04
(2 <i>E</i> ,6 <i>E</i>)-Farnesol	14.24	1718	0.06	16.82	2311	0.08
Total identified		96.65%			96.16%	
Total reported		96.99%			96.50%	

*: 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

tr: The compound has been detected below 0.005% of total signal.

Notation: correction factor was applied
R.T.: Retention time (minutes)
RI: Retention index

Essential oil, *Melaleuca quinquenervia* ct. Nerolina (linalool/nerolidol)
Internal code: 18I25-FSE12-1-CC

Nerolina - Australia - EA120618

Report prepared for
Flowers Shining Everywhere Inc.

Terpinolene	5.44*	1083	0.39	4.35	1243	0.07
trans-Linalool oxide (fur.)	5.44*	1083	[0.39]	6.90	1427	0.31
Linalool	5.92	1107	39.47	8.12	1519	39.87
trans-Pinocarveol	6.22	1132	0.02	9.21	1605	0.02
Isopulegol	6.33	1139	0.01	8.19*	1525	[0.01]
Nerol oxide	6.51	1151	0.01	6.80	1420	0.01
Isoneral	6.67	1161	0.01	7.89	1501	0.01
cis-Linalool oxide (pyr.)	6.75*	1166	0.04	10.36	1698	0.05
Borneol	6.75*	1166	[0.04]	9.77*	1650	0.68
Terpinen-4-ol	6.86*	1173	3.24	8.59	1556	3.14
trans-Linalool oxide (pyr.)	6.86*	1173	[3.24]	10.60*	1718	0.22
α-Terpineol	7.08	1187	0.60	9.77*	1650	0.68
Hodiendiol	7.18	1194	0.02	12.81*	1913	0.30
Nerol	7.67	1226	0.09	11.04	1756	0.11
Geraniol	8.09	1254	0.24	11.60	1805	0.23
Unknown [m/z 192, 93 (76), 177 (59), 121 (49), 136 (45), 91 (39)...]	8.32	1269	0.02	7.77	1493	0.02
Methyl thiobenzoate?	8.53	1283	0.02			
Eugenol	9.52	1352	0.04	14.80	2103	0.05
Hodiendiol derivative III	9.74*	1367	0.01			
α-Copaene	9.74*	1367	[0.01]	7.28*	1456	[0.43]
Methyleugenol	10.19	1399	0.01			
Isocaryophyllene	10.22	1401	0.02	8.30*	1533	0.03
β-Caryophyllene	10.32	1409	2.52	8.55	1553	2.49
cis-α-Bergamotene	10.44	1418	0.01	8.30*	1533	[0.03]
Aromadendrene	10.59	1429	0.06	8.67	1562	0.05
α-Humulene	10.78	1443	0.40	9.40	1620	0.38
Cabreuva oxide A?	10.90	1452	0.10			
allo-Aromadendrene (3Z,6E)-α-Farnesene	10.92	1454	9.16	9.12	1597	0.04
Unknown [m/z 151, 67 (52), 69 (46), 41 (34), 95 (32), 55 (30), 105 (30)... 204 (3)]	11.44	1492	0.09	10.26*	1690	0.17
(Z)-α-Bisabolene	11.52	1498	0.04	10.42	1703	0.05
β-Bisabolene (3E,6E)-α-Farnesene	11.61*	1505	0.30	10.26*	1690	[0.17]
(Z)-γ-Bisabolene	11.61*	1505	10.30	10.60*	1718	[0.22]
δ-Cadinene	11.65	1508	0.05	9.94	1664	0.04
	11.76*	1517	0.13	10.45	1706	0.08

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