

Analysis Sage, Desert Essential Oil

Laboratoire
PhytoChemia



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Date : August 11, 2017

SAMPLE IDENTIFICATION

Internal code : 17G28-FSE7-1-CC

Customer identification : Desert Sage - USA - HOA-92216

Type : Essential oil

Source : *Artemisia tridentata*

Customer : Flowers Shining Everywhere Inc.



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 : 2017-08-04



Checked and approved by :

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



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Unknown (m/z = 79, 91 (2), 77 (70), 96 (61), 93 (47), 41 (45), 135 (38)...) livinglibationv	6.93	1118	0.19				livinglibationv + ★ ★ ★ ●	
Unknown (m/z = 67, 123 (66), 68 (62), 138 (59), 95 (57), 82 (49)...) livinglibationv	7.03	1121	0.33					
Chrysanthenone?	7.16	1126	0.15					Monoterp. ketone
Methyl santolinate	7.36	1134	3.67	[3.68]	1362	5.61*		Monoterp. ester
Unknown (m/z = 119, 79 (58), 91 (58), 41 (41), 43 (40), 77 (37), 93 (35)...) livinglibationv	7.50	1139	0.31				livinglibationv + ★ ★ ★ ●	
Camphor	7.94	1155	34.10	34.19	1427	6.62		Monoterp. ketone
Unknown (m/z = 79, 93 (64), 81 (63), 53 (58), 41 (57), 91 (54), 43 (53)...) livinglibationv	8.28	1167	1.51				livinglibationv + ★ ★ ★ ●	
cis-Chrysanthenol	8.54	1177	0.24					Monoterp. alcohol
Borneol	8.73	1184	1.94	2.31	1612	11.65		Monoterp. alcohol
Artemisyl acetate	8.83	1187	0.13					Monoterp. ester
Terpinen-4-ol	8.89	1189	1.02	4.20	1528	8.85*		Monoterp. alcohol
Myrtenal	9.38	1205	0.24	[4.20]	1528	8.85*		Monoterp. aldehyde
Myrtenol	9.53	1208	0.36	0.44	1700	15.54		Monoterp. alcohol
α-Terpineol	9.67	1211	0.05	0.21	1622	12.02		Monoterp. alcohol
Unknown (m/z = 68, 67 (34), 96 (15), 41 (14), 81 (11), 69 (9)...) livinglibationv	11.06	1242	0.32					
Unknown (m/z = 119, 43 (92), 91 (50), 93 (33), 79 (31), 77 (24), 105 (24), 41 (20)...) livinglibationv	11.15	1244	0.16				livinglibationv + ★ ★ ★ ●	
Unknown (m/z = 119, 91 (55), 43 (53), 79 (22), 105 (22), 41 (19), 134 (17)...) livinglibationv	11.52	1252	0.36					
Unknown (m/z = 95, 43 (30), 67 (26), 121 (22), 93 (15), 55 (12)...) livinglibationv	11.93	1261	0.11				livinglibationv + ★ ★ ★ ●	
Unknown (m/z = 69, 41 (50), 68 (14), 67 (9), 164 (8), 81 (6), 109 (6)...) livinglibationv	12.06	1264	0.11				livinglibationv + ★ ★ ★ ●	
Unknown (m/z = 68, 67 (34), 41 (12), 69 (9), 79 (9), 79 (9), 43 (8), 53 (8)...) livinglibationv	12.42	1272	0.22					
Unknown (m/z = 43, 119 (92), 91 (44), 93 (35), 79 (33), 77 (24), 105 (24)...) livinglibationv	12.51	1274	0.33				livinglibationv + ★ ★ ★ ●	

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Isobutylal	0.44	644	0.01				Aliphatic aldehyde
Methacrolein	0.46	646	0.13	0.13	688	0.50	Aliphatic aldehyde
2-Methylfuran	0.50	652	0.03				Furan
Isobutanol	0.60	665	0.03				Aliphatic alcohol
Methyl 2-methylbutyrate	1.48	781	0.01				Aliphatic ester
Nonene	2.81	890	0.05	0.05	867	0.73	Alkene
Santolinatriene	2.98	903	1.59	1.62	966	1.10	Monoterpene
Tricyclene	3.25	919	0.41	0.42	924	0.92	Monoterpene
α -Thujene	3.34	924	0.10	1.79	947	1.02*	Monoterpene
α -Pinene	3.45	931	1.78	[1.79]	947	1.02*	Monoterpene
Camphene	3.75	949	8.25	8.15	1003	1.27	Monoterpene
Thuja-2,4(10)-diene	3.83	953	0.09	0.06	1053	1.70*	Monoterpene
Sabinene	4.17	973	0.06	[0.06]	1053	1.70*	Monoterpene
Artemiseole	4.25	979	9.87	9.26	1128	2.39*	Monoterp. ether
Myrcene	4.51	994	0.10	0.08	1102	2.25	Monoterpene
Δ^3 -Carene	4.79*	1009	1.14	0.05	1082	2.01	Monoterpene
α -Phellandrene	4.79*	1009	[1.14]	0.69	1097	2.18	Monoterpene
Yomogi alcohol	4.79*	1009	[1.14]	0.47	1330	5.12	Monoterp. alcohol
α -Terpinene	4.98	1020	0.31	[9.26]	1128	2.39*	Monoterpene
para-Cymene	5.19	1031	1.38	1.22	1204	3.36	Monoterpene
1,8-Cineole	5.29*	1037	11.25	11.55	1148	2.64*	Monoterp. ether
Limonene	5.29*	1037	[11.25]	[11.55]	1148	2.64*	Monoterpene
Santolina alcohol	5.36	1041	0.11	0.07	1348	5.39	Monoterp. alcohol
cis- β -Ocimene	5.38	1042	0.02	0.49	1186	3.14*	Monoterpene
trans- β -Ocimene	5.57	1052	0.14	0.09	1200	3.31	Monoterpene
Santolina epoxide?	5.66	1057	0.04				Monoterp. alcohol
γ -Terpinene	5.76	1062	0.52	[0.49]	1186	3.14*	Monoterpene
Bergamal	5.79	1064	0.19	0.13	1303	4.73	Aliphatic aldehyde
Artemisia ketone	5.82	1066	1.00	0.91	1286	4.48	Monoterp. ketone
Unknown (m/z = 82, 67 (75), 71 (61), 43 (34), 41 (32), 79 (14), ...)	6.07*	1079	0.81				
Unknown (m/z = 95, 67 (55), 55 (28), 41 (23), 93 (14), 68 (14), ...)	6.07*	1079	[0.81]				
Unknown (m/z = 95, 67 (49), 55 (26), 41 (20), 79 (13), 93 (13), ...)	6.12	1082	0.41				
Artemisia alcohol	6.24	1089	0.12	0.23	1440	6.83	Monoterp. alcohol
Terpinolene	6.26	1090	0.13	0.12	1222	3.59	Monoterpene
para-Cymenene	6.42	1099	0.09	3.68	1362	5.61*	Monoterpene

Bornyl acetate	13.00	1285	0.67	0.78	1499	8.19	Monoterp. ester
Myrtenyl acetate	15.31	1325	0.02	0.03	1605	11.42	Monoterp. ester
α -Copaene	17.82	1363	0.51	0.46	1444	6.90	Sesquiterpene
Unknown (m/z = 119, 43 (45), 91 (43), 105 (20), 41 (19), 79 (17), 134 (15)...))	18.71	1376	0.13				
Isobornyl isobutyrate	19.24	1384	0.12				
β -Caryophyllene	20.78	1406	2.72	[4.20]	1528	8.85*	Sesquiterpene
β -Copaene	21.66	1417	0.04	0.03	1508	8.39	Sesquiterpene
Aromadendrene	22.11	1422	0.05	[4.20]	1528	8.85*	Sesquiterpene
α -Humulene	23.54	1439	0.16	0.13	1569	10.13	Sesquiterpene
γ -Muurolene	25.23	1460	0.07	0.04	1601	11.27	Sesquiterpene
Germacrene D	25.83	1467	3.23	3.67	1631	12.33*	Sesquiterpene
γ -Curcumene	26.21	1471	0.60	[3.67]	1631	12.33*	Sesquiterpene
Bicyclogermacrene	27.02	1481	0.31	0.51	1652	13.11*	Sesquiterpene
α -Muurolene	27.80	1491	0.17	[0.51]	1652	13.11*	Sesquiterpene
γ -Cadinene	28.86	1504	0.14	0.13	1665	13.74	Sesquiterpene
δ -Cadinene	29.52	1513	0.50	0.58	1682	14.61	Sesquiterpene
(E)-Nerolidol	33.93*	1574	0.26	0.06	1993	33.75	Sesquiterp. alcohol
Caryophyllene oxide	33.93*	1574	[0.26]	0.13	1855	24.72	Sesquiterp. ether
Spathulenol	34.12	1577	0.42	0.42	2029	35.29	Sesquiterp. alcohol
τ -Muurolol	37.74	1648	0.04	0.06	2090	37.76	Sesquiterp. alcohol
α -Cadinol	38.18	1659	0.13	0.14	2130	38.99	Sesquiterp. alcohol
Total identified			91.34%	89.78%			

*: 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: Clear liquid

Refractive index: 1.4698 \pm 0.0003 (20 °C)

CONCLUSION

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

Essential oil, *Artemisia tridentata*
Internal Code: 17G28-FSE7-1-CC

Customer Identification:
Desert Sage - USA - HOA-92216

Report prepared for
Flowers Shining Everywhere Inc.



