

**Schizandra Berry Essential Oil**

# **ESSENTIAL OIL ANALYSIS**

Laboratoire  
**PhytoChemia**





Date : June 29, 2017

SAMPLE IDENTIFICATION

Internal code : 17F08-FSE2-1-DM

Customer identification : Schizandra CO2 - Lot #911301

Type : Essential oil

Source : Schizandra spenantha

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 : 2017-06-19



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.	
1,2,3-Trimethylcyclopentene	1.14	735	0.01				Dinormonoterpene
Camphene	3.70	946	0.01	0.01	988	1.29	Monoterpene
Myrcene	4.47	992	0.06	0.05	1108	2.31	Monoterpene
Bornyl acetate	12.86	1282	0.01	0.01	1495	8.52	Monoterp. ester
δ-Elemene	15.04	1321	0.01				Sesquiterpene
α-Copaene	17.64	1360	0.09	0.10	1427	6.92	Sesquiterpene
Daucene	17.84	1363	0.02	0.02	1442	7.27	Sesquiterpene
β-Bourbonene	18.05	1366	0.01				Sesquiterpene
Sibirene	19.46	1388	0.02	0.02	1480	8.16	Sesquiterpene
α-Cedrene	20.15	1398	0.03	0.74	1502	8.68*	Sesquiterpene
β-Caryophyllene	20.50	1403	0.21	0.19	1511	8.91	Sesquiterpene
β-Gurjunene	20.69	1405	0.02	0.04	1528	9.33*	Sesquiterpene
α-Santalene	20.92	1408	0.80	[0.74]	1502	8.68*	Sesquiterpene
trans-α-Bergamotene	22.08	1422	0.02	[0.04]	1528	9.33*	Sesquiterpene
Germacrene D	25.48	1463	0.06	0.06	1614	12.44	Sesquiterpene
β-Himachalene	27.27	1484	0.64	0.51	1633	13.22	Sesquiterpene
Cuparene	27.99	1493	0.18	0.14	1693	16.29	Sesquiterpene
γ-Cadinene	28.60	1500	0.94	0.83	1660	14.63	Sesquiterpene
β-Bisabolene	28.75	1502	0.17	0.17	1651	14.16	Sesquiterpene
δ-Cadinene	29.21	1509	0.12	0.09	1665	14.86	Sesquiterpene
Germacrene B	31.04	1534	0.16	0.14	1705	16.92	Sesquiterpene
Caryophyllene oxide	33.69*	1571	0.11	0.03	1845	25.70	Sesquiterp. ether
(E)-Nerolidol	33.69*	1571	[0.11]	0.03	1980	34.36	Sesquiterp. alcohol
τ-Cadinol	37.25	1636	0.01	0.02	2076	38.19	Sesquiterp. alcohol
(Z)-α-Santalol	39.35	1688	0.07	0.06	2252	43.04	Sesquiterp. alcohol
(E)-α-Santalol	39.62	1694	0.31	0.16	2303	44.20	Sesquiterp. alcohol
(Z)-β-Santalol	40.76	1729	0.09	0.10	2344	45.11	Sesquiterp. alcohol
Unknown (m/z = 159, 94 (76), 91 (75), 177 (74), 79 (71), 117 (51)... 220 (3))	41.31	1746	1.76	1.69	2369	45.66	Oxygenated sesquiterp.
(E)-β-Santalol	41.45	1750	0.12	0.10	2354	45.36	Sesquiterp. alcohol
β-Acoradienol	41.66	1757	0.35				Sesquiterp. alcohol
Unknown (m/z 91, 79 (83), 105 (68), 109 (63), 41 (590), 93 (58), 107 (57)... 220 (6))	41.96	1767	0.58	0.60	2405	46.44	Sesquiterp. alcohol
Acoradienol isomer	42.77	1792	0.40				Sesquiterp. alcohol
Unknown (m/z = 91, 149 (63), 79 (62), 105 (61), 177 (53), 131 (51), 159 (50)... 220 (13))	42.92	1797	0.93	0.87	2478	47.94	Sesquiterp. alcohol



Unknown lignan (m/z = 135, 136 (28), 326 (14))	61.29	2638	0.20						Lignan
Anwulignan	61.81	2667	5.03	4.93	3509	65.08			Lignan
Deoxyschizandrin?	62.05	2681	5.99	6.04	3876	70.10			Lignan
Unknown lignan (m/z = 159...)	76.54	3507	12.63	16.97	4022	72.06			Lignan
<b>Total identified</b>			<b>30.46%</b>	<b>33.25%</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

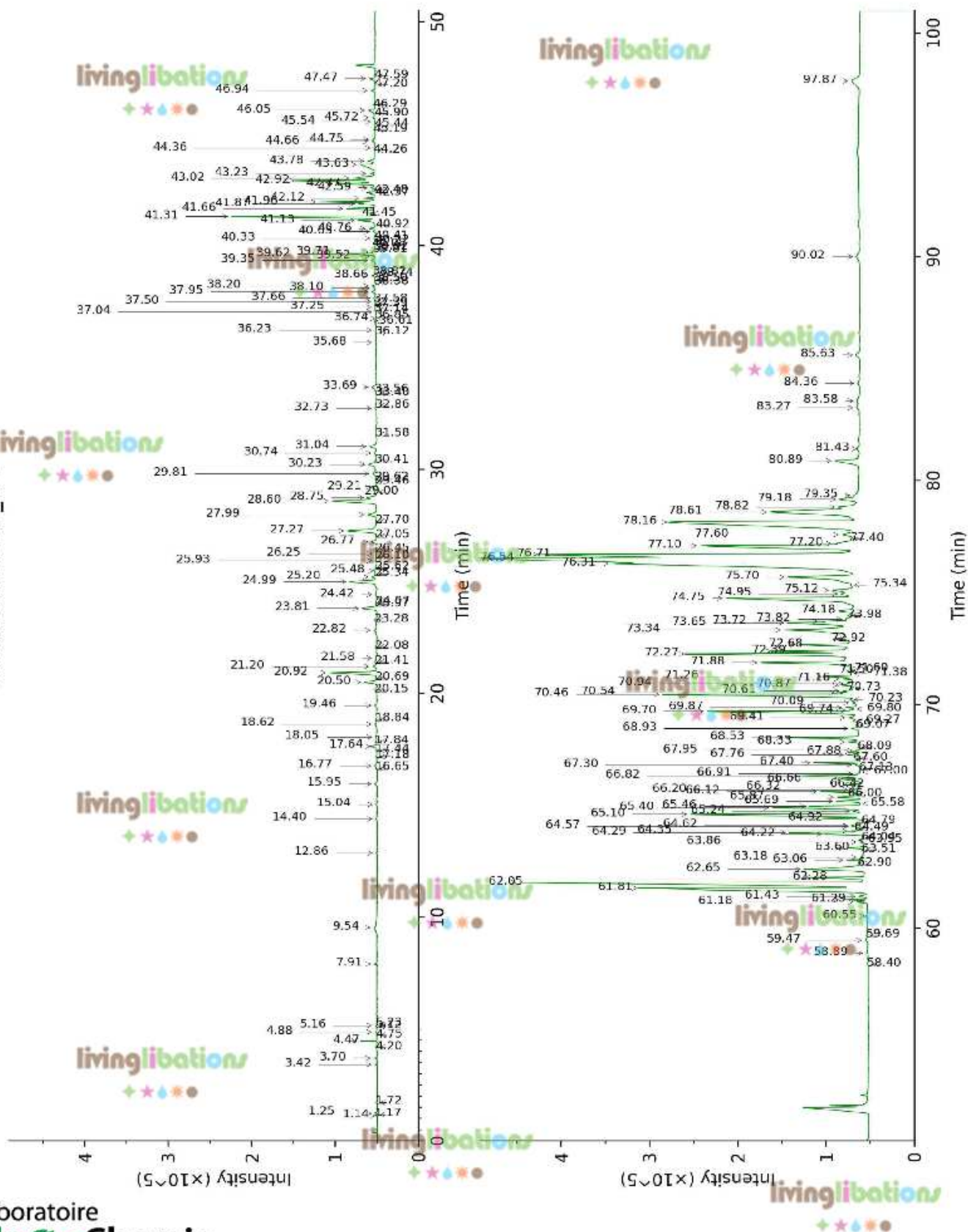
**Physical aspect :** Yellow liquid

**Refractive index :** 1.4915 ± 0.0003 (20 °C)

#### CONCLUSION

- No adulterant, contaminant or diluent were detected using this method. The volatile (pre 1800 RI) fraction of the sample corresponds to the stated composition for this species. As expected in a CO2 extract (as opposed to an oil), several non-volatiles are also present. This species is well-known for producing an array of lignans. They are prominently present on the chromatograms in FID; however, most of them do not show up properly on GC-MS, a phenomenon that has already been described by other investigators. Most of the non-reported peaks in the identification table thus correspond to lignans, in line with expectations for this species.

17F08-FSE2-1-DM\_BP5



17F08-FSE2-1-DM\_WAX

