



GC/MS BATCH NUMBER: CB7101

ESSENTIAL OIL: COPAIBA ORGANIC
BOTANICAL NAME: COPAIFERA OFFICINALIS
ORIGIN: BRAZIL

KEY CONSTITUENTS PRESENT IN THIS BATCH OF COPAIBA ORGANIC OIL	%
β-CARYOPHYLLENE	38.5
GERMACRENE D	9.9
trans-α-BERGAMOTENE	6.3
α-COPAENE	5.4
α-HUMULENE	5.1
δ-CADINENE	3.0
METHYL KOLAVENATE	2.8
β-BISABOLENE	2.1
GERMACRENE B	1.5
β-ELEMENE	1.2
VIRIDIFLORENE	1.1
β-SELINENE	1.0

Comments from Robert Tisserand: Beautiful balsamic, lemon-wood odor quality. Contains approximately 12% of heavier molecules (diterpene acids) which are not found in the essential oil.

Date : January 11, 2018

SAMPLE IDENTIFICATION

Internal code : 18A04-PTH2-1-CC

Customer identification : Copaiba Organic - Brazil - CB710167R

Type : Essential oil

Source : *Copaifera officinalis*

Customer : Plant Therapy

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 : 2018-01-11

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.	
Limonene	5.18	1028	tr	tr	1135	2.59	Monoterpene
cis- β -Ocimene	5.36	1037	0.19	0.18	1180	3.17	Monoterpene
trans- β -Ocimene	5.54	1047	0.01	0.01	1199	3.37	Monoterpene
allo-Ocimene	7.24	1125	0.03	0.03	1314	5.04	Monoterpene
δ -Elemene	15.36	1321	0.28	0.25	1408	6.52	Sesquiterpene
α -Cubebene	16.04	1331	0.76	0.65	1398	6.33	Sesquiterpene
Cycloisosativene	17.08	1347	0.02	0.02	1411	6.58	Sesquiterpene
α -Ylangene	17.30	1350	0.09	0.08	1414	6.65	Sesquiterpene
α -Copaene	17.87	1359	5.39	4.98	1424	6.85	Sesquiterpene
Cyperene	18.77	1372	0.76	0.61	1469	7.75	Sesquiterpene
β -Elemene	19.04	1376	1.15	5.73	1522	9.20*	Sesquiterpene
7-epi-Sesquithujene	19.35	1381	0.17				Sesquiterpene
β -Caryophyllene	21.11	1405	38.53	36.57	1519	9.11	Sesquiterpene
γ -Elemene	22.02	1416	0.16	0.15	1560	10.42	Sesquiterpene
trans- α -Bergamotene	22.41	1421	6.32	[5.73]	1522	9.20*	Sesquiterpene
cis- β -Farnesene	23.06	1429	0.50	0.41	1571	10.77	Sesquiterpene
α -Humulene	23.66	1436	5.11	4.95	1577	10.97	Sesquiterpene
allo-Aromadendrene	23.84	1438	0.47	0.46	1551	10.14	Sesquiterpene
9-epi- β -Caryophyllene	24.24	1443	0.16	0.11	1659	14.64	Sesquiterpene
trans- β -Farnesene	24.64	1447	0.31	2.08	1602	11.96*	Sesquiterpene
Germacrene D	25.99*	1463	12.25	9.92	1614	12.51	Sesquiterpene
γ -Muurolene	25.99*	1463	[12.25]	[2.08]	1602	11.96*	Sesquiterpene
Viridiflorene	26.46*	1469	1.77	1.06	1617	12.64	Sesquiterpene
β -Selinene	26.46*	1469	[1.77]	1.01	1622	12.89	Sesquiterpene
α -Selinene	27.08*	1476	1.84	0.79	1631	13.30	Sesquiterpene
Bicyclogermacrene	27.08*	1476	[1.84]	0.46	1633	13.42	Sesquiterpene
α -Muurolene	27.81	1485	0.53	0.27	1644	13.93	Sesquiterpene
γ -Cadinene	28.87	1498	0.95	0.77	1657	14.53	Sesquiterpene
β -Bisabolene	29.05	1500	2.12	1.76	1648	14.11	Sesquiterpene
δ -Cadinene	29.60	1508	3.00	2.65	1665	14.90	Sesquiterpene
trans-Calamenene	29.91	1512	0.09	0.07	1721	18.02	Sesquiterpene
trans- γ -Bisabolene	30.36	1519	0.39	0.29	1683	15.75	Sesquiterpene
trans-Cadina-1,4-diene	30.66	1523	0.22	0.22	1695	16.39	Sesquiterpene
β -Sesquiphellandrene	30.87	1526	0.15	0.12	1691	16.13	Sesquiterpene
α -Cadinene	31.01	1528	0.17	1.35	1709	17.26*	Sesquiterpene
trans- α -Bisabolene	31.99	1542	0.24	[1.35]	1709	17.26*	Sesquiterpene
Germacrene B	32.20	1545	1.45	[1.35]	1709	17.26*	Sesquiterpene
Maaliol	33.23	1559	0.15	0.08	1877	28.57	Sesquiterp. alcohol
Caryophyllenyl alcohol	33.81	1567	0.18				Sesquiterp. alcohol
Caryophyllene oxide	33.92	1569	0.09	0.06	1842	26.00	Sesquiterp. ether
Globulol	34.45	1577	0.07	0.06	1962	33.72	Sesquiterp. alcohol

Viridiflorol	34.95	1584	0.11	0.10	1968	34.09	Sesquiterp. alcohol
Junenol	36.08	1601	0.94	0.88	1918	31.14	Sesquiterp. alcohol
1,10-diepi-Cubenol	36.72	1617	0.11	0.20	1947	32.85*	Sesquiterp. alcohol
Cubenol	37.34	1632	0.10	[0.20]	1947	32.85*	Sesquiterp. alcohol
τ -Cadinol	37.64	1639	0.20	0.17	2060	37.86	Sesquiterp. alcohol
τ -Muurolol	37.75	1642	0.40	0.37	2075	38.39	Sesquiterp. alcohol
α -Muurolol	37.88	1645	0.50	0.44	2089	38.90	Sesquiterp. alcohol
Selin-11-en-4- α -ol	38.02	1649	0.10	0.12	2124	39.87	Sesquiterp. alcohol
α -Cadinol	38.20	1653	0.70	0.53	2116	39.64	Sesquiterp. alcohol
Manool	49.44	2042	0.20	0.18	2531	49.09	Sesquiterp. alcohol
Linoleic acid	52.03	2156	0.10	0.15	3083	58.80	Fatty acid
Stearic acid	52.98	2199	0.16	0.10	3064	58.49	Fatty acid
Copalol	54.76	2284	0.23				Diterp. alcohol
Kolavenol	55.01	2296	0.10				Diterp. alcohol
Methyl kolavenate	56.19	2354	2.76				Diterp. ester
<i>C. officinalis</i> biomarker	59.17	2507	0.94				Diterp. acid?
<i>C. officinalis</i> biomarker	61.23	2619	0.22				Diterp. acid?
<i>C. officinalis</i> biomarker	62.90	2712	0.80	1.49	4039	84.85	Diterp. acid?
Total identified			94.74%	82.94%			

*: 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

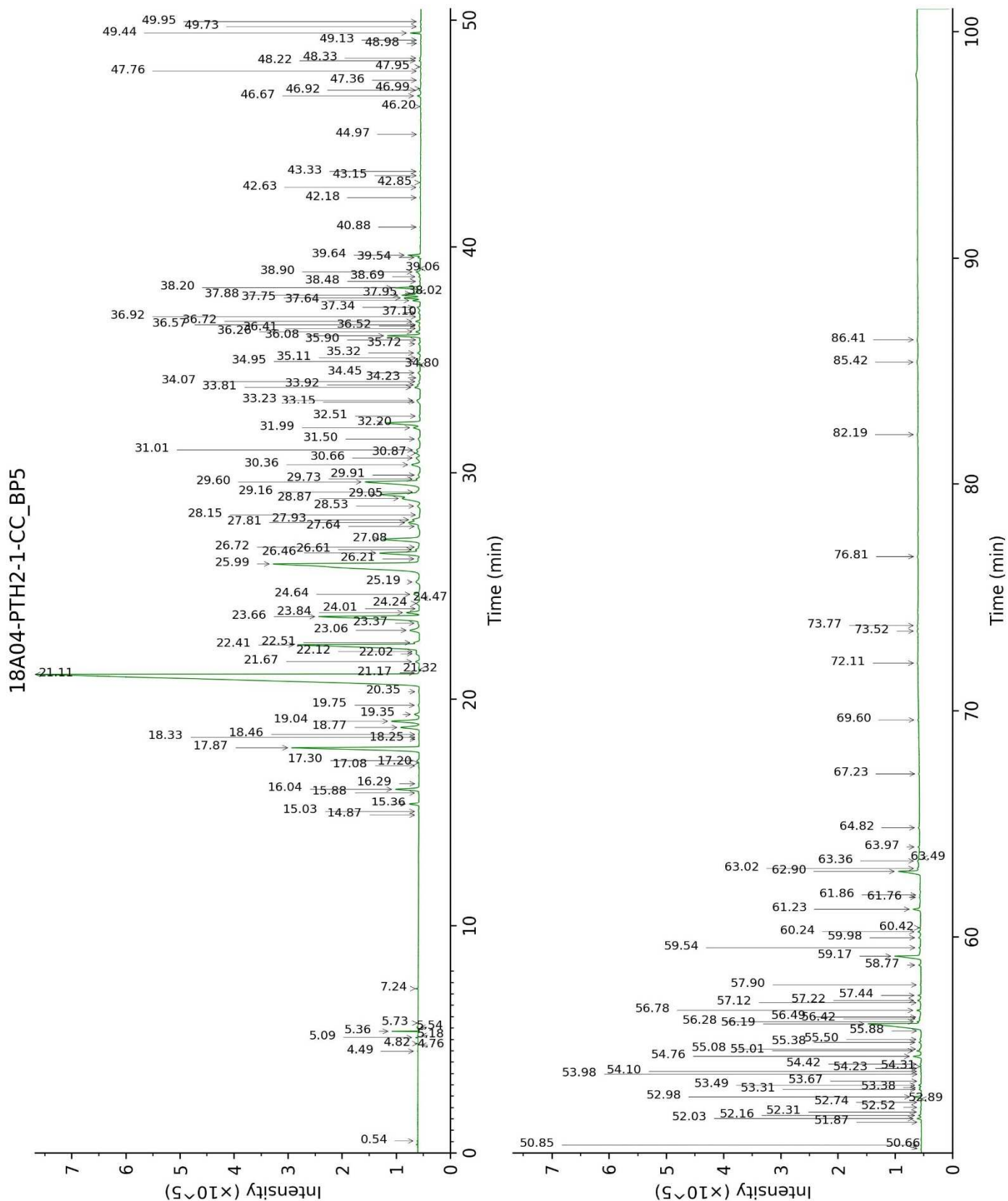
OTHER DATA

Physical aspect : Light yellow liquid

Refractive index : 1.5045 \pm 0.0003 (20 °C)

CONCLUSION

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



18A04-PTH2-1-CC_WAX

