

## GC/MS BATCH NUMBER: CJ0104

---

**ESSENTIAL OIL:** COPAIBA BALSAM  
**BOTANICAL NAME:** COPAIFERA OFFICINALIS  
**ORIGIN:** BAZIL

KEY CONSTITUENTS PRESENT IN THIS BATCH OF COPAIBA OIL	%
$\beta$ -CARYOPHYLLENE	20.7
trans- $\alpha$ -BERGAMOTENE	6.3
METHYL KOLA VENATE	6.0
C. OFFICINALIS BIOMARKER	4.8
GERMACRENE D	4.7
$\beta$ -BISABOLENE	4.2
$\alpha$ -COPAENE	4.0
$\alpha$ -HUMULENE	2.7
$\delta$ -CADINENE	2.3
C. OFFICINALIS BIOMARKER	1.8
3- $\alpha$ -HYDROXY-MANOOL?	1.5
GERMACRENE B	1.3
VIRIDIFLORENE	1.2

Comments from Robert Tisserand: Subtle, woody-lemony odor quality. Constituents are in expected amounts, with about 27% of heavier molecules (not found in the distilled oil).

**Date :** November 30, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17K29-PTH2-1-CC

**Customer identification :** Copaiba - Brazil - CJ0104612R

**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 :** 2017-11-30

Checked and approved by :

---

Sylvain Mercier, M. Sc., chimiste 2014-005

*Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.*

*This report is digitally signed, it is only considered valid if the digital signature is intact.*

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
<i>cis</i> - $\beta$ -Ocimene	5.34*	1037	0.07	0.06	1187	3.43*	Monoterpene
$\delta$ -Elemene	15.30*	1321	0.34	0.33	1419	7.03*	Sesquiterpene
$\alpha$ -Cubebene	15.97*	1331	0.60	0.51	1411	6.83*	Sesquiterpene
$\alpha$ -Ylangene	17.22*	1350	0.08	0.07	1425	7.18*	Sesquiterpene
$\alpha$ -Copaene	17.77*	1358	4.00	3.50	1434	7.39*	Sesquiterpene
Cyperene	18.68*	1372	0.37	0.31	1478	8.42*	Sesquiterpene
$\beta$ -Elemene	18.94*	1376	0.88	6.06	1532	10.01*	Sesquiterpene
7-epi-Sesquithujene	19.26*	1381	0.25				Sesquiterpene
$\beta$ -Caryophyllene	20.90*	1404	20.71	18.09	1527	9.83*	Sesquiterpene
$\gamma$ -Elemene	21.93*	1416	0.28	0.17	1569	11.37*	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	22.31*	1421	6.26	[6.06]	1532	10.01*	Sesquiterpene
<i>cis</i> - $\beta$ -Farnesene	22.94*	1428	0.35	2.81	1583	11.92*	Sesquiterpene
$\alpha$ -Humulene	23.50*	1435	2.73	[2.81]	1583	11.92*	Sesquiterpene
allo-Aromadendrene	23.70*	1437	0.30	0.29	1562	11.13*	Sesquiterpene
<i>trans</i> - $\beta$ -Farnesene	24.53*	1447	0.34	1.44	1614	13.09*	Sesquiterpene
$\gamma$ -Muurolene	25.06*	1453	0.23	[1.44]	1614	13.09*	Sesquiterpene
Germacrene D	25.74*	1462	4.69	4.00	1623	13.58*	Sesquiterpene
Viridiflorene	26.31*	1468	1.22	[1.44]	1614	13.09*	Sesquiterpene
$\alpha$ -Selinene	26.91*	1475	0.75	0.57	1634	14.10*	Sesquiterpene
Bicyclogermacrene	26.91*	1475	[0.75]	0.21	1642	14.52*	Sesquiterpene
$\alpha$ -Muurolene	27.68*	1485	0.41	0.44	1646	14.73*	Sesquiterpene
$\gamma$ -Cadinene	28.75*	1497	0.71	0.52	1670	16.01*	Sesquiterpene
$\beta$ -Bisabolene	28.99*	1501	4.17	4.02	1661	15.53*	Sesquiterpene
$\delta$ -Cadinene	29.46*	1507	2.27	2.21	1676	16.31*	Sesquiterpene
<i>trans</i> - $\gamma$ -Bisabolene	29.77*	1512	0.06	[2.21]	1676	16.31*	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	30.24*	1518	0.63	0.70	1695	17.30*	Sesquiterpene
$\beta$ -Sesquiphellandrene	30.52*	1522	0.26	0.48	1708	17.99*	Sesquiterpene
$\alpha$ -Cadinene	30.88*	1527	0.19	[0.48]	1708	17.99*	Sesquiterpene
<i>trans</i> - $\alpha$ -Bisabolene	31.89*	1541	0.45	[0.48]	1708	17.99*	Sesquiterpene
Germacrene B	32.09*	1544	1.25	1.06	1721	18.82*	Sesquiterpene
Maaliol	33.04*	1558	0.08	0.05	1884	30.02*	Sesquiterp. alcohol
Caryophyllenyl alcohol	33.70*	1567	0.14				Sesquiterp. alcohol
Caryophyllene oxide	33.82*	1569	0.12	0.22	1844	27.08*	Sesquiterp. ether
Globulol	34.36*	1576	0.03	0.04	1964	34.64*	Sesquiterp. alcohol
Viridiflorol	34.85*	1583	0.05	0.04	1975	35.14*	Sesquiterp. alcohol
Humulene epoxide II	35.63*	1594	0.03	0.04	1907	31.79*	Sesquiterp. ether
Junenol	35.99*	1600	0.65	0.60	1921	32.65*	Sesquiterp. alcohol
Cubenol	37.24*	1631	0.09	0.11	1951	34.05*	Sesquiterp. alcohol
$\tau$ -Cadinol	37.54*	1638	0.08	0.10	2073	38.82*	Sesquiterp. alcohol
$\tau$ -Muurolol	37.66*	1641	0.19	0.32	2082	39.11*	Sesquiterp. alcohol
$\alpha$ -Muurolol	37.78*	1644	0.23	0.23	2096	39.57*	Sesquiterp. alcohol

$\alpha$ -Cadinol	38.09*	1651	0.41	0.51	2119	40.27*	Sesquiterp. alcohol
$\alpha$ -Bisabolol	39.55*	1687	0.19	0.24	2127	40.50*	Sesquiterp. alcohol
Manool	49.37*	2039	0.35	0.40	2542	49.80*	Diterp. alcohol
<i>trans</i> -Kolavelool	49.66*	2052	0.65				Diterp. alcohol
Linoleic acid	52.02*	2156	0.59	0.44	3075	59.13*	Fatty acid
Oleic acid	52.15*	2162	0.40	0.91	3120	59.85*	Fatty acid
3- $\alpha$ -Hydroxy-manool?	54.77*	2285	1.50				Diterp. alcohol
Copalol	54.94*	2293	0.97				Diterp. alcohol
Kolavenol	55.02*	2297	1.27				Diterp. alcohol
Methyl copalate	55.18*	2305	0.35				Diterp. ester
Methyl kolavenate	56.24*	2357	5.95	5.49	3456	64.95*	Diterp. ester
<i>C. officinalis</i> biomarker	56.89*	2389	1.83	2.25	3533	66.05*	Diterp. acid?
Methyl hardwickiate?	58.74*	2485	0.55				Diterp. ester
<i>C. officinalis</i> biomarker	59.25*	2511	4.75	8.41	3892	70.93*	Diterp. acid?
<i>C. officinalis</i> biomarker	61.20*	2617	0.72				Diterp. acid?
<i>C. officinalis</i> biomarker	62.88*	2711	2.74	5.00	4066	74.46*	Diterp. acid?
<b>Total identified</b>			<b>79.76%</b>	<b>73.25%</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 viscous liquid

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

#### CONCLUSION

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



17K29-PTH2-1-CC\_WAX

