

Date : July 06, 2021

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

**Internal code** : 21F21-PTH11


**Customer identification** : Lemongrass ORGANIC - India - L90110202R

**Type** : Essential oil

**Source** : *Cymbopogon flexuosus*

**Customer** : Plant Therapy

ANALYSIS

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

**Analyst** : Seydou Ka, Ph. D.

**Analysis date** : July 05, 2021

Checked and approved by :

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

*Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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. The results only describe the samples that were submitted to the assays.*

*PHYSICOCHEMICAL DATA*

**Physical aspect:** Light yellow liquid

**Refractive index:**  $1.4847 \pm 0.0003$  (20 °C; method PC-MAT-016)

*CONCLUSION*

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

## ANALYSIS SUMMARY – CONSOLIDATED CONTENTS

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
Isovaleral	0.01	Aliphatic aldehyde
2-Methylbutyral	tr	Aliphatic aldehyde
2-Ethylfuran	tr	Furan
Isoamyl alcohol	0.01	Aliphatic alcohol
Hexanal	tr	Aliphatic aldehyde
Unknown	tr	Unknown
(2E)-Hexenal	tr	Aliphatic aldehyde
(3Z)-Hexenol	0.01	Aliphatic alcohol
4-Heptanone	0.02	Aliphatic ketone
Unknown	tr	Unknown
Tricyclene	0.10	Monoterpene
$\alpha$ -Pinene	0.14	Monoterpene
Camphene	0.79	Monoterpene
Benzaldehyde	tr	Simple phenolic
$\beta$ -Pinene	0.01	Monoterpene
Sabinene	0.01	Monoterpene
Dehydro-1,8-cineole	0.03	Monoterpenic ether
6-Methyl-5-hepten-2-one	1.43	Aliphatic ketone
Myrcene	0.06	Monoterpene
6-Methyl-5-hepten-2-ol	0.05	Aliphatic alcohol
$\alpha$ -Phellandrene	0.01	Monoterpene
Octanal	0.05	Aliphatic aldehyde
$\Delta^3$ -Carene	tr	Monoterpene
$\alpha$ -Terpinene	tr	Monoterpene
para-Cymene	0.01	Monoterpene
1,8-Cineole	0.03	Monoterpenic ether
Limonene	0.22	Monoterpene
Benzeneacetaldehyde	0.01	Simple phenolic
(Z)- $\beta$ -Ocimene	0.29	Monoterpene
(E)- $\beta$ -Ocimene	0.19	Monoterpene
2,6-Dimethyl-5-heptenal (melonal)	0.02	Aliphatic aldehyde
$\gamma$ -Terpinene	0.01	Monoterpene
cis-Sabinene hydrate	tr	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
4-Nonanone	0.89	Aliphatic ketone
Camphenilone	0.01	Normoterpenic ketone
Terpinolene	0.06	Monoterpene
4-Nonanol	0.03	Aliphatic alcohol
Rosefuran	0.01	Monoterpenic ether
Perillene	0.20	Monoterpenic ether
Linalool	1.16	Monoterpenic alcohol
cis-Chrysanthemal?	0.02	Monoterpenic aldehyde
(Z)-6-Methyl-3,5-heptadien-2-one	0.02	Aliphatic ketone
trans-para-Mentha-2,8-dien-1-ol	0.01	Monoterpenic alcohol
Unknown	0.02	Unknown

Unknown	0.04	Unknown
Unknown	0.09	Unknown
exo-Isocitral	0.02	Monoterpenic aldehyde
<i>trans</i> -Chrysanthemal	0.32	Monoterpenic aldehyde
<i>trans</i> -Chrysanthemol	tr	Monoterpenic alcohol
Citronellal	0.31	Monoterpenic aldehyde
Borneol	0.23	Monoterpenic alcohol
$\alpha$ -Phellandren-8-ol	0.04	Monoterpenic alcohol
Isoneral	0.37	Monoterpenic aldehyde
Rosefuran oxide	0.04	Monoterpenic ether
Terpinen-4-ol	0.19	Monoterpenic alcohol
Unknown	0.11	Oxygenated monoterpene
Unknown	0.04	Unknown
Isogeranial	0.60	Monoterpenic aldehyde
$\alpha$ -Terpineol	0.13	Monoterpenic alcohol
Unknown	0.04	Unknown
$\gamma$ -Terpineol	0.01	Monoterpenic alcohol
<i>trans</i> -Isopiperitenol	0.02	Monoterpenic alcohol
Unknown	0.04	Oxygenated monoterpene
Decanal	0.11	Aliphatic aldehyde
<i>cis</i> -Isopiperitenol	tr	Monoterpenic alcohol
2,3-Epoxyneral?	0.02	Monoterpenic aldehyde
Nerol	0.01	Monoterpenic alcohol
Citronellol	0.13	Monoterpenic alcohol
Piperitone	0.05	Monoterpenic ketone
Neral	29.91	Monoterpenic aldehyde
( <i>E</i> )-Isogeraniol?	0.06	Monoterpenic alcohol
Geraniol	7.02	Monoterpenic alcohol
Geranial	39.15	Monoterpenic aldehyde
Unknown	0.20	Oxygenated monoterpene
Bornyl acetate	0.02	Monoterpenic ester
2-Undecanone	0.01	Aliphatic ketone
Geranyl formate	0.05	Monoterpenic ester
Unknown	0.05	Unknown
$\alpha$ -Cubebene	0.05	Sesquiterpene
Citronellyl acetate	0.02	Monoterpenic ester
Cyclosativene I	0.06	Sesquiterpene
Cyclosativene II	0.10	Sesquiterpene
Neryl acetate	0.13	Monoterpenic ester
Geranic acid	0.19	Aliphatic acid
$\beta$ -Cubebene	0.09	Sesquiterpene
Geranyl acetate	4.23	Monoterpenic ester
$\beta$ -Elemene	tr	Sesquiterpene
Longifolene	0.03	Sesquiterpene
$\beta$ -Caryophyllene	1.93	Sesquiterpene
$\beta$ -Copaene	0.02	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	0.01	Sesquiterpene
( <i>E</i> )-Isoeugenol	0.47	Phenylpropanoid
$\alpha$ -Humulene	0.19	Sesquiterpene
<i>cis</i> -Muurolo-4(15),5-diene	0.01	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.03	Sesquiterpene
Germacrene D	0.28	Sesquiterpene

γ-Amorphene	0.02	Sesquiterpene
epi-Cubebol	0.16	Sesquiterpenic alcohol
α-Murolene	0.05	Sesquiterpene
δ-Amorphene	0.02	Sesquiterpene
Cubebol	0.48	Sesquiterpenic alcohol
γ-Cadinene	0.89	Sesquiterpene
δ-Cadinene	0.29	Sesquiterpene
10-epi-Cubebol?	0.05	Sesquiterpenic alcohol
(E)-γ-Bisabolene	0.17	Sesquiterpene
Neryl butyrate	0.05	Monoterpenic ester
(E)-α-Bisabolene	0.09	Sesquiterpene
α-Elemol	0.09	Sesquiterpenic alcohol
Germacrene B	0.05	Sesquiterpene
Geranyl butyrate	0.06	Monoterpenic ester
Caryophyllene oxide	0.51	Sesquiterpenic ether
Caryophyllene oxide isomer	0.24	Sesquiterpenic ether
Humulene epoxide II	0.05	Sesquiterpenic ether
Selin-6-en-4α-ol isomer	0.02	Sesquiterpenic alcohol
1-epi-Cubebol	0.01	Sesquiterpenic alcohol
Cubebol	0.03	Sesquiterpenic alcohol
β-Eudesmol	0.01	Sesquiterpenic alcohol
α-Eudesmol	0.01	Sesquiterpenic alcohol
Unknown	0.01	Oxygenated sesquiterpene
(2Z,6Z)-Farnesol	0.01	Sesquiterpenic alcohol
Farnesal isomer	tr	Sesquiterpenic aldehyde
(2E,6Z)-Farnesal	0.03	Sesquiterpenic aldehyde
Neophytadiene	0.03	Diterpene
Phytone	0.01	Terpenic ketone
Geranyl caprylate	0.01	Monoterpenic ester
Unknown	0.02	Unknown
Unknown	0.08	Unknown
Dicitral	0.08	Diterpenic aldehyde
Unknown	0.12	Unknown
Phytol	0.04	Diterpenic alcohol
Unknown	0.01	Unknown
Phytol isomer I	0.15	Diterpenic alcohol
Unknown	0.01	Unknown
Unknown	0.01	Unknown
Unknown	0.02	Unknown
Unknown	0.03	Unknown
β-Bourbonene	0.02	Sesquiterpene
<b>Consolidated total</b>	<b>97.30%</b>	

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

Note: no correction factor was applied

**About "consolidated" data:** The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report to access the full untreated data and perform their own calculations if needed.

**Unknowns:** Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.



This page was intentionally left blank. The following pages present the complete data of the analysis.

