

Date : September 10, 2021

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 21H27-PTH02


Customer identification : Allspice - Jamaica - A10106208

Type : Essential oil

Source : *Pimenta dioica*

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 : Sarah-Eve Tremblay, M. Sc. A., Chimiste

Analysis date : September 07, 2021

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Light orange liquid

Refractive index: 1.5310 ± 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 |
|-------------------------------------|-------|----------------------|
| α -Thujene | 0.02 | Monoterpene |
| α -Pinene | 0.36 | Monoterpene |
| Camphene | 0.01 | Monoterpene |
| β -Pinene | 0.09 | Monoterpene |
| Sabinene | 0.01 | Monoterpene |
| Octen-3-ol | 0.05 | Aliphatic alcohol |
| Octan-3-one | 0.05 | Aliphatic ketone |
| Myrcene | 1.55 | Monoterpene |
| Pseudolimonene | 0.03 | Monoterpene |
| α -Phellandrene | 0.44 | Monoterpene |
| Δ^3 -Carene | 0.02 | Monoterpene |
| α -Terpinene | 0.03 | Monoterpene |
| para-Cymene | 0.79 | Monoterpene |
| Limonene | 0.36 | Monoterpene |
| 1,8-Cineole | 2.13 | Monoterpenic ether |
| (Z)- β -Ocimene | 0.14 | Monoterpene |
| (E)- β -Ocimene | 0.28 | Monoterpene |
| γ -Terpinene | 0.25 | Monoterpene |
| Terpinolene | 0.53 | Monoterpene |
| <i>trans</i> -Linalool oxide (fur.) | 0.01 | Monoterpenic alcohol |
| para-Cymenene | 0.01 | Monoterpene |
| Linalool | 0.25 | Monoterpenic alcohol |
| Ethyl benzoate | 0.01 | Phenolic ester |
| Terpinen-4-ol | 0.26 | Monoterpenic alcohol |
| para-Cymen-8-ol | 0.02 | Monoterpenic alcohol |
| α -Terpineol | 0.53 | Monoterpenic alcohol |
| Methylchavicol | 0.02 | Phenylpropanoid |
| Geraniol | 0.01 | Monoterpenic alcohol |
| Chavicol | 0.56 | Phenylpropanoid |
| α -Terpinyl acetate | 0.03 | Monoterpenic ester |
| Eugenol | 71.72 | Phenylpropanoid |
| Dihydroeugenol | 0.03 | Phenylpropanoid |
| α -Copaene | 0.07 | Sesquiterpene |
| β -Elemene | 0.02 | Sesquiterpene |
| α -Gurjunene | 0.02 | Sesquiterpene |
| Methyleugenol | 7.30 | Phenylpropanoid |
| β -Caryophyllene | 7.48 | Sesquiterpene |
| β -Copaene | 0.01 | Sesquiterpene |
| Aromadendrene | 0.01 | Sesquiterpene |
| α -Humulene | 2.28 | Sesquiterpene |
| allo-Aromadendrene | 0.03 | Sesquiterpene |
| Selina-4,11-diene | 0.02 | Sesquiterpene |
| γ -Murolene | 0.01 | Sesquiterpene |
| α -Amorphene | 0.01 | Sesquiterpene |
| β -Selinene | 0.05 | Sesquiterpene |

| | | |
|--------------------------------|---------------|--------------------------|
| α-Selinene | tr | Sesquiterpene |
| Viridiflorene | 0.01 | Sesquiterpene |
| α-Muurolene | 0.02 | Sesquiterpene |
| γ-Cadinene | 0.05 | Sesquiterpene |
| <i>trans</i> -Calamenene | 0.01 | Sesquiterpene |
| δ-Cadinene | 0.56 | Sesquiterpene |
| <i>trans</i> -Cadina-1,4-diene | 0.01 | Sesquiterpene |
| α-Cadinene | tr | Sesquiterpene |
| α-Calacorene | 0.01 | Sesquiterpene |
| Unknown | 0.01 | Unknown |
| Unknown | 0.01 | Oxygenated sesquiterpene |
| Caryophyllene oxide | 0.06 | Sesquiterpenic ether |
| Caryophyllene oxide isomer | 0.02 | Sesquiterpenic ether |
| Globulol | 0.02 | Sesquiterpenic alcohol |
| Viridiflorol | 0.02 | Sesquiterpenic alcohol |
| Methoxyeugenol | 0.02 | Phenylpropanoid |
| Eudesm-5-en-11-ol | 0.01 | Sesquiterpenic alcohol |
| Unknown | tr | Oxygenated sesquiterpene |
| Caryophylladienol II | 0.01 | Sesquiterpenic alcohol |
| τ-Cadinol | 0.01 | Sesquiterpenic alcohol |
| α-Muurolol | 0.01 | Sesquiterpenic alcohol |
| α-Cadinol | tr | Sesquiterpenic alcohol |
| Selin-11-en-4α-ol | 0.01 | Sesquiterpenic alcohol |
| (<i>E</i>)-Coniferyl alcohol | 0.02 | Phenylpropanoid |
| Unknown | 0.05 | Unknown |
| meta-Camphorene | 0.05 | Diterpene |
| para-Camphorene | 0.02 | Diterpene |
| Unknown | 0.08 | Lignan |
| Unknown | 0.03 | Lignan |
| Consolidated total | 99.01% | |

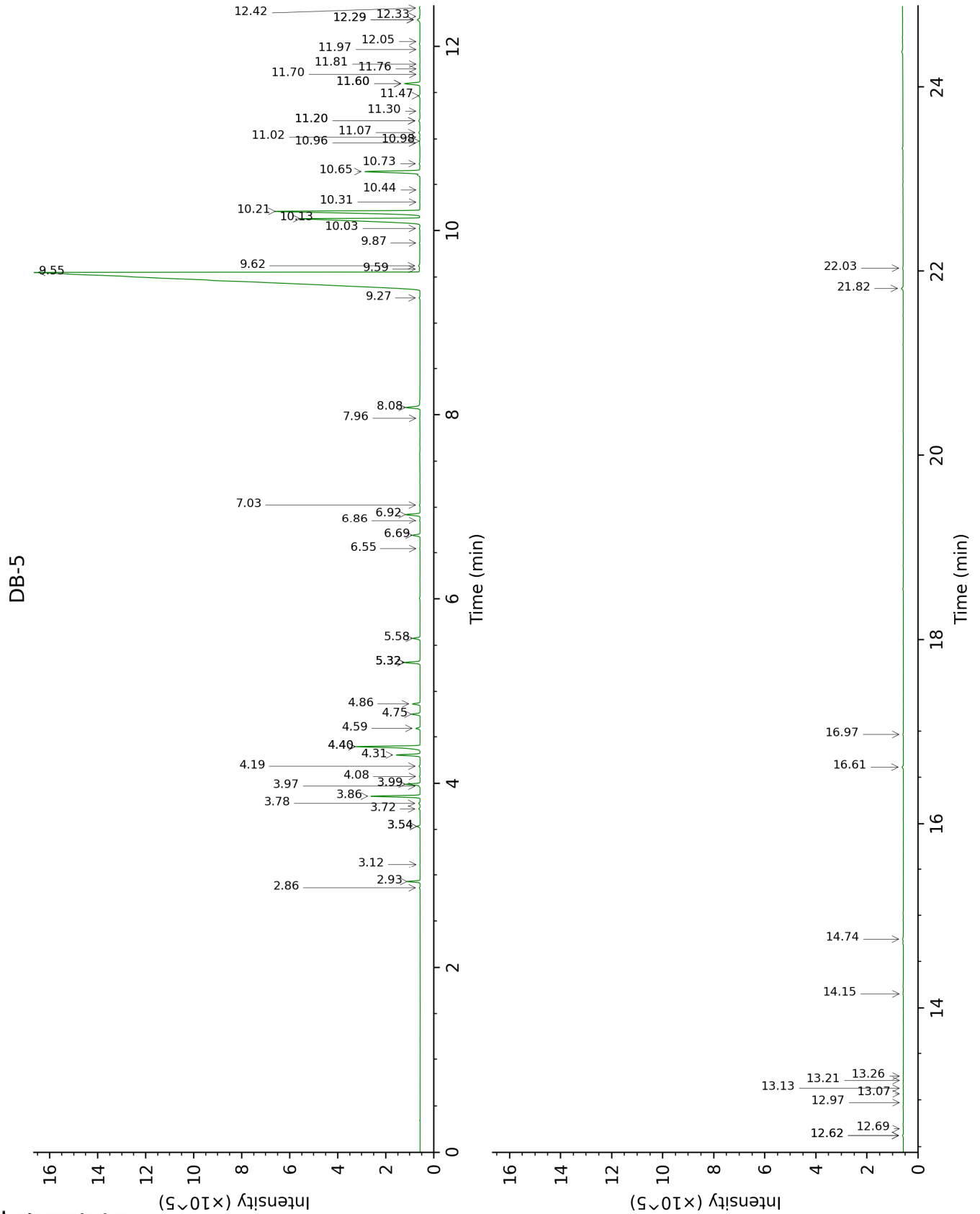
tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

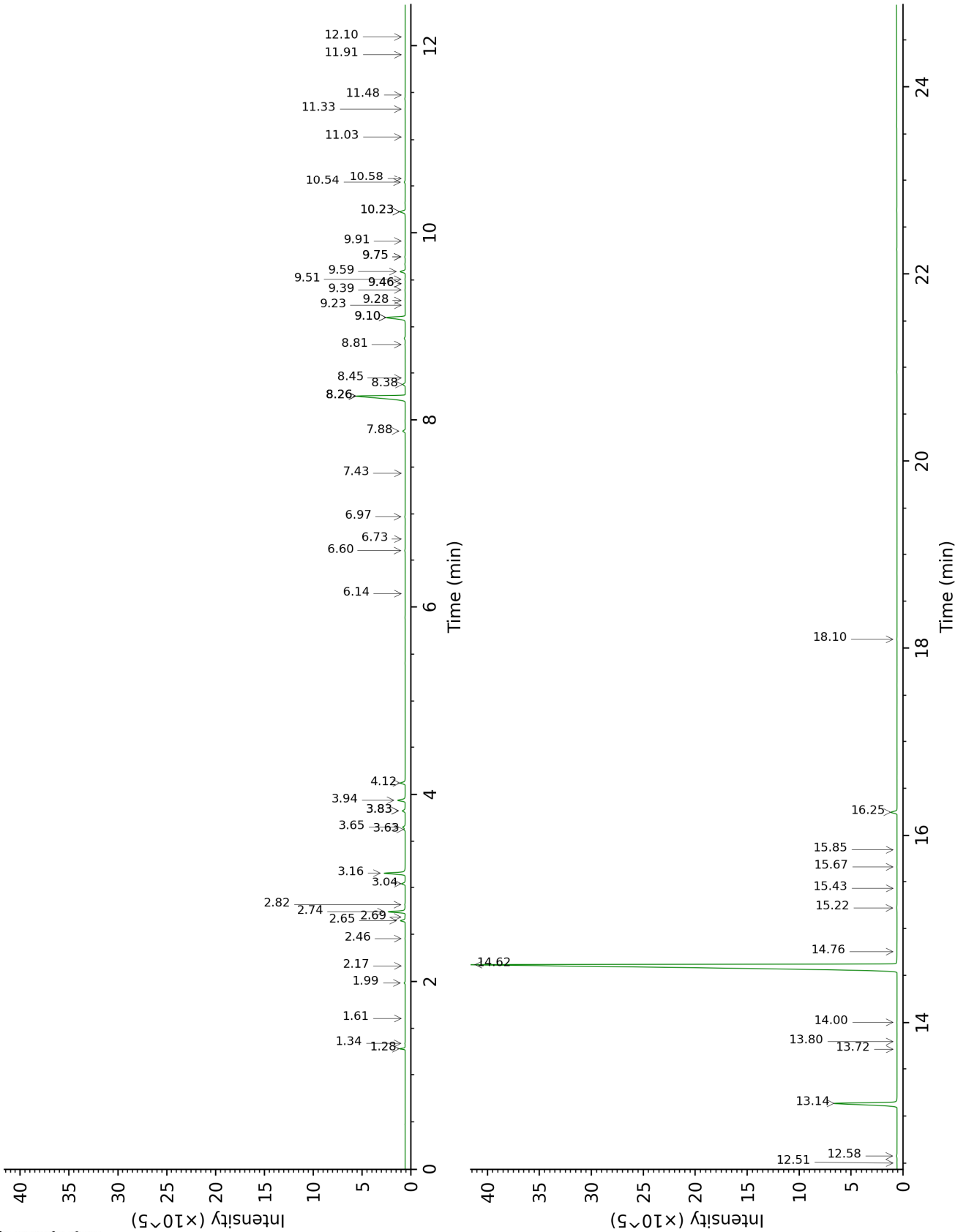
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm 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.

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DB-WAX



FULL ANALYSIS DATA

| Identification | Column DB-5 | | | Column DB-WAX | | |
|--------------------------------|-------------|------|--------|---------------|------|--------|
| | R.T | R.I | % | R.T | R.I | % |
| α-Thujene | 2.86 | 926 | 0.02 | 1.34 | 999 | 0.03 |
| α-Pinene | 2.93 | 930 | 0.36 | 1.28 | 990 | 0.36 |
| Camphene | 3.12 | 943 | 0.01 | 1.61 | 1026 | 0.01 |
| β-Pinene | 3.54* | 971 | 0.10 | 1.98 | 1064 | 0.09 |
| Sabinene | 3.54* | 971 | [0.10] | 2.17 | 1083 | 0.01 |
| Octen-3-ol | 3.72 | 984 | 0.05 | 6.60 | 1418 | 0.05 |
| Octan-3-one | 3.78 | 988 | 0.05 | 3.83* | 1218 | 0.33 |
| Myrcene | 3.86 | 993 | 1.55 | 2.74 | 1132 | 1.53 |
| Pseudolimonene | 3.97† | 1000 | 0.49 | 2.69 | 1128 | 0.03 |
| α-Phellandrene | 3.99† | 1002 | [0.49] | 2.65 | 1125 | 0.44 |
| Δ ³ -Carene | 4.08 | 1007 | 0.02 | 2.46 | 1109 | 0.02 |
| α-Terpinene | 4.19 | 1014 | 0.03 | 2.82 | 1138 | 0.05 |
| para-Cymene | 4.31 | 1022 | 0.79 | 3.94 | 1227 | 0.79 |
| Limonene | 4.40* | 1028 | 2.49 | 3.04 | 1156 | 0.36 |
| 1,8-Cineole | 4.40* | 1028 | [2.49] | 3.16 | 1166 | 2.13 |
| (Z)-β-Ocimene | 4.60 | 1040 | 0.14 | 3.63 | 1204 | 0.11 |
| (E)-β-Ocimene | 4.75 | 1050 | 0.28 | 3.83* | 1218 | [0.33] |
| γ-Terpinene | 4.86 | 1057 | 0.25 | 3.65 | 1206 | 0.28 |
| Terpinolene | 5.32* | 1086 | 0.54 | 4.12 | 1241 | 0.53 |
| trans-Linalool oxide (fur.) | 5.32* | 1086 | [0.54] | 6.73 | 1427 | 0.01 |
| para-Cymenene | 5.32* | 1086 | [0.54] | 6.14 | 1384 | 0.01 |
| Linalool | 5.58 | 1102 | 0.25 | 7.88 | 1514 | 0.25 |
| Ethyl benzoate | 6.55 | 1165 | 0.01 | 9.10* | 1609 | 2.28 |
| Terpinen-4-ol | 6.69 | 1174 | 0.26 | 8.38 | 1553 | 0.27 |
| para-Cymen-8-ol | 6.86 | 1184 | 0.02 | 11.33 | 1794 | 0.02 |
| α-Terpineol | 6.92 | 1189 | 0.53 | 9.59 | 1649 | 0.53 |
| Methylchavicol | 7.03 | 1195 | 0.02 | 9.23 | 1620 | 0.01 |
| Geraniol | 7.96 | 1258 | 0.01 | 11.48 | 1808 | 0.01 |
| Chavicol | 8.08 | 1266 | 0.56 | 16.25 | 2264 | 0.64 |
| α-Terpinyl acetate | 9.27 | 1348 | 0.03 | 9.51 | 1642 | 0.03 |
| Eugenol | 9.55 | 1368 | 71.72 | 14.62 | 2099 | 71.96 |
| Dihydroeugenol | 9.59 | 1370 | 0.03 | 14.00 | 2039 | 0.02 |
| α-Copaene | 9.62 | 1373 | 0.07 | 6.97 | 1445 | 0.05 |
| β-Elemene | 9.87 | 1390 | 0.02 | 8.26* | 1543 | 7.40 |
| α-Gurjunene | 10.03 | 1402 | 0.02 | 7.43 | 1480 | 0.01 |
| Methyleugenol | 10.13 | 1409 | 7.30 | 13.14 | 1958 | 7.32 |
| β-Caryophyllene | 10.21 | 1415 | 7.48 | 8.26* | 1543 | [7.40] |
| β-Copaene | 10.31 | 1422 | 0.01 | 8.26* | 1543 | [7.40] |
| Aromadendrene | 10.44 | 1432 | 0.01 | 8.45 | 1558 | 0.01 |
| α-Humulene | 10.65 | 1448 | 2.28 | 9.10* | 1609 | [2.28] |
| allo- Aromadendrene | 10.73 | 1454 | 0.03 | 8.81 | 1586 | 0.03 |
| Selina-4,11-diene | 10.96 | 1471 | 0.02 | 9.28 | 1624 | 0.02 |
| γ-Murolene | 10.98 | 1472 | 0.01 | 9.46* | 1639 | 0.02 |
| α-Amorphene | 11.02 | 1476 | 0.01 | 9.40 | 1633 | 0.03 |
| β-Selinene | 11.07 | 1479 | 0.05 | 9.75* | 1662 | 0.05 |
| α-Selinene | 11.20* | 1489 | 0.06 | 9.75* | 1662 | [0.05] |

| | | | | | | |
|--|--------|------|--------|--------|------|--------|
| Viridiflorene | 11.20* | 1489 | [0.06] | 9.46* | 1639 | [0.02] |
| α-Muurolene | 11.30 | 1496 | 0.02 | 9.92 | 1676 | 0.01 |
| γ-Cadinene | 11.47 | 1509 | 0.05 | 10.23* | 1701 | 0.62 |
| <i>trans</i> -Calamenene | 11.60* | 1520 | 0.61 | 11.03 | 1769 | 0.01 |
| δ-Cadinene | 11.60* | 1520 | [0.61] | 10.23* | 1701 | [0.62] |
| <i>trans</i> -Cadina-1,4-diene | 11.70 | 1527 | 0.01 | 10.54 | 1728 | 0.10 |
| α-Cadinene | 11.76 | 1532 | tr | 10.58 | 1731 | 0.02 |
| α-Calacorene | 11.81 | 1536 | 0.01 | 11.91 | 1846 | 0.01 |
| Unknown [m/z 180, 93 (77), 55 (67), 125 (66), 208 (62), 65 (43)...] | 11.97 | 1548 | 0.01 | | | |
| Unknown [m/z 138, 96 (100), 95 (85), 109 (74), 110 (60), 105 (57)... 220 (10)] | 12.05 | 1555 | 0.01 | 12.10 | 1863 | tr |
| Caryophyllene oxide | 12.29* | 1574 | 0.13 | 12.58 | 1906 | 0.06 |
| Caryophyllene oxide isomer | 12.29* | 1574 | [0.13] | 12.50 | 1899 | 0.02 |
| Globulol | 12.33 | 1577 | 0.02 | 13.72 | 2012 | 0.01 |
| Viridiflorol | 12.42 | 1584 | 0.02 | 13.80 | 2020 | 0.02 |
| Methoxyeugenol | 12.62* | 1600 | 0.03 | 18.10 | 2465 | 0.02 |
| Eudesm-5-en-11-ol | 12.62* | 1600 | [0.03] | | | |
| Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)] | 12.69 | 1606 | tr | | | |
| Caryophylladienol II | 12.97 | 1629 | 0.01 | 15.85 | 2223 | 0.01 |
| τ-Cadinol | 13.07 | 1637 | 0.01 | 14.76 | 2113 | 0.04 |
| α-Muurolol | 13.13 | 1642 | 0.01 | | | |
| α-Cadinol | 13.21 | 1649 | tr | | | |
| Selin-11-en-4α-ol | 13.26 | 1652 | 0.01 | 15.43 | 2180 | 0.01 |
| (<i>E</i>)-Coniferyl alcohol | 14.15 | 1728 | 0.02 | | | |
| Unknown [m/z 151, 194 (67), 138 (47), 91 (35), 77 (27), 55 (21)...] | 14.74 | 1779 | 0.05 | | | |
| meta-Camphorene | 16.61 | 1950 | 0.05 | 15.22 | 2159 | 0.07 |
| para-Camphorene | 16.97 | 1984 | 0.02 | 15.67 | 2204 | 0.02 |
| Unknown [m/z 326, 148 (67), 147 (41), 117 (30), 91 (22)...] | 21.82 | 2503 | 0.08 | | | |

| | | | | |
|--|-------|---------------|------|---------------|
| Unknown [m/z 326, 150 (54), 161 (42), 202 (41), 201 (28)] | 22.03 | 2529 | 0.03 | |
| Total identified | | 99.00% | | 99.14% |
| Total reported | | 99.17% | | 99.14% |

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken into account in the consolidated total

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

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

Note: no correction factor was applied
R.T.: Retention time (minutes)
R.I.: Retention index