

Date : 2024-07-19

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24G05-PTH01

Customer Identification : Organic Pink Grapefruit - USA - GK0108R

Type : Essential Oil

Source : *Citrus x paradisi* cv. Pink [syn. *Citrus x paradisi* cv. Red]

Customer : Plant Therapy

Checked and approved by:

Alexis St-Gelais, Ph. D., Chimiste 2013-174

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GAS CHROMATOGRAPHIC ANALYSIS

Method : PC-MAT-014 - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID

***ISO**

Results : See analysis summary (next page)

Analyst : Alexis St-Gelais, Ph. D., Chimiste 2013-174

Date : 2024-07-18

PHYSICOCHEMICAL DATA

Refractive index : 1.4756 ± 0.0003 (20 °C)

Method : PC-MAT-016 - Measure of the refractive index of a liquid.

Analyst : Cindy Caron B. Sc.

Date : 2024-07-08

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 -Pinene | 0.58 | Monoterpene |
| β -Pinene | 0.04 | Monoterpene |
| Sabinene | 0.31 | Monoterpene |
| Myrcene | 1.97 | Monoterpene |
| α -Phellandrene | 0.03 | Monoterpene |
| Octanal | 0.22 | Aliphatic aldehyde |
| Limonene | 93.40 | Monoterpene |
| (<i>E</i>)- β -Ocimene | 0.10 | Monoterpene |
| Octanol | 0.02 | Aliphatic alcohol |
| Terpinolene | 0.01 | Monoterpene |
| Linalool | 0.07 | Monoterpenic alcohol |
| Nonanal | 0.07 | Aliphatic aldehyde |
| <i>trans</i> -Limonene oxide | 0.02 | Monoterpenic ether |
| Citronellal | 0.07 | Monoterpenic aldehyde |
| β -Phellandrene | 0.30 | Monoterpene |
| α -Terpineol | 0.04 | Monoterpenic alcohol |
| Decanal | 0.24 | Aliphatic aldehyde |
| <i>trans</i> -Carveol | 0.01 | Monoterpenic alcohol |
| Octyl acetate | 0.04 | Aliphatic ester |
| Neral | 0.04 | Monoterpenic aldehyde |
| Geranial | 0.06 | Monoterpenic aldehyde |
| α -Terpinyl acetate | 0.02 | Monoterpenic ester |
| Limonene hydroperoxide IV | 0.03 | Monoterpenic peroxide |
| Neryl acetate | 0.01 | Monoterpenic ester |
| α -Copaene | 0.10 | Sesquiterpene |
| Geranyl acetate | 0.06 | Monoterpenic ester |
| β -Cubebene | 0.10 | Sesquiterpene |
| β -Elemene | 0.03 | Sesquiterpene |
| Dodecanal | 0.03 | Aliphatic aldehyde |
| β -Caryophyllene | 0.29 | Sesquiterpene |
| α -Humulene | 0.05 | Sesquiterpene |
| (<i>E</i>)- β -Farnesene | 0.03 | Sesquiterpene |
| Germacrene D | 0.10 | Sesquiterpene |
| Bicyclogermacrene | 0.05 | Sesquiterpene |
| α -Muurolene | 0.01 | Sesquiterpene |
| δ -Cadinene | 0.12 | Sesquiterpene |
| α -Elemol | 0.03 | Sesquiterpenic alcohol |
| Germacrene D-4-ol | 0.02 | Sesquiterpenic alcohol |
| Caryophyllene oxide | 0.01 | Sesquiterpenic ether |
| Nootkatone | 0.09 | Sesquiterpenic ketone |

| | | |
|-------------------------------------|--------------|----------------|
| Osthole | 0.07 | Coumarin |
| Oleic acid | 0.02 | Aliphatic acid |
| Isoauraptene | 0.05 | Coumarin |
| Meranzin | 0.07 | Coumarin |
| Auraptene | 0.71 | Coumarin |
| Epoxyaurapten | 0.08 | Coumarin |
| Tangeretin | 0.04 | Flavonoid |
| 3,3',4',5,6,7,8-Heptamethoxyflavone | 0.03 | Flavonoid |
| Consolidated total | 99.90 | |

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

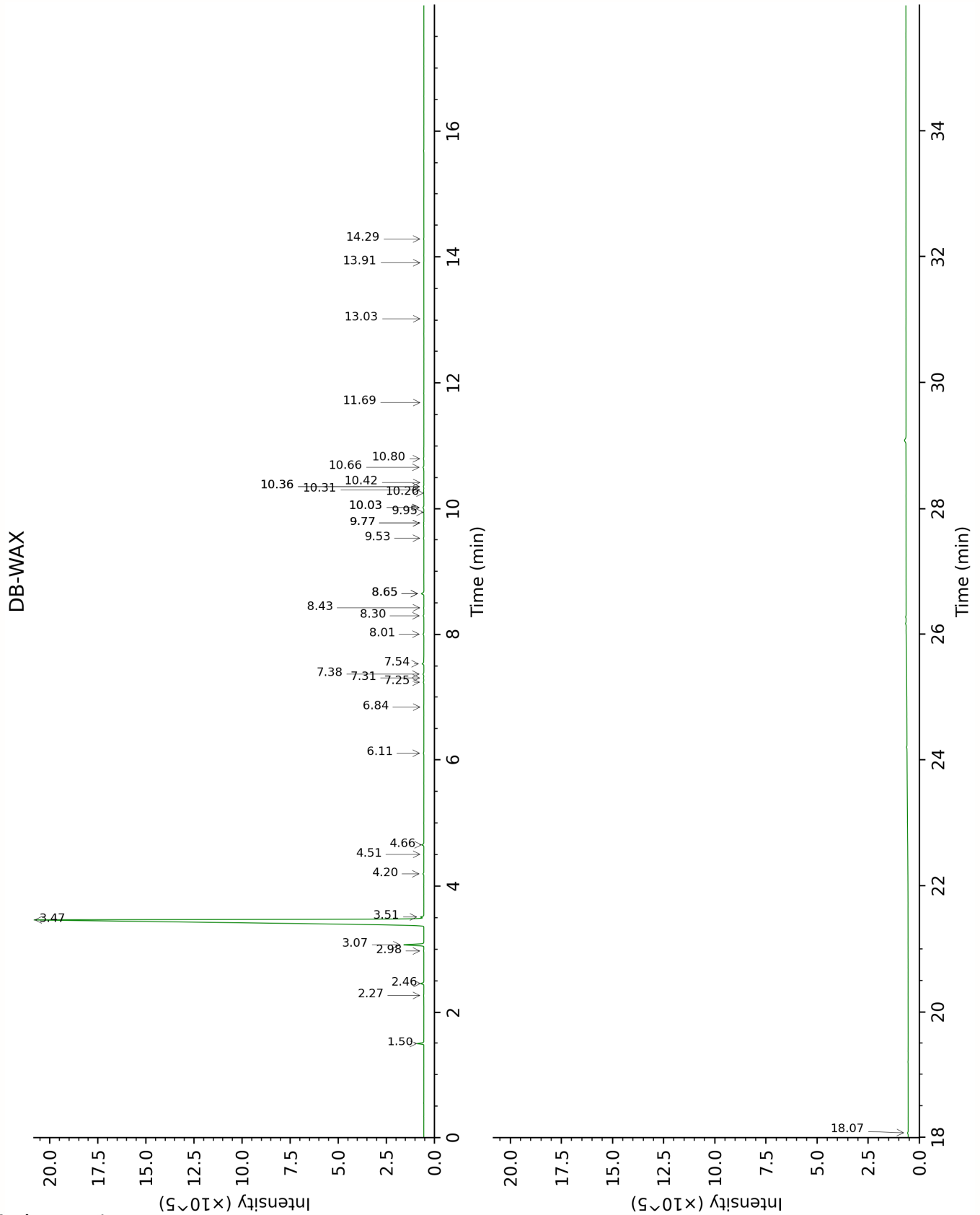
Note: no correction factor was applied

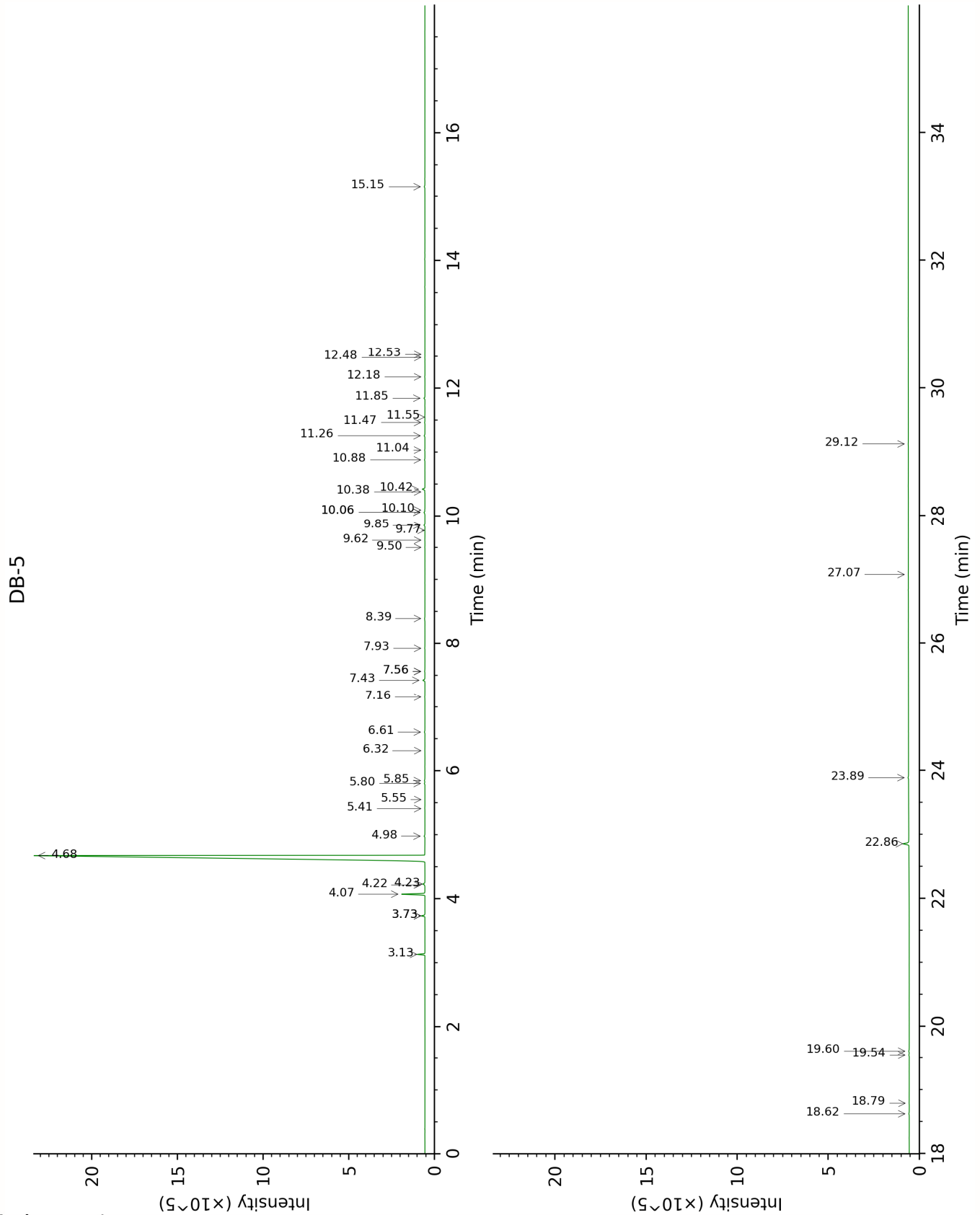
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

Bracketed value (xx): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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FULL ANALYSIS DATA

| α-Pinene | Column DB-WAX | | | Column DB-5 | | |
|-----------------------------------|---------------|--------|--------|-------------|--------|--------|
| | 1.50 | 991.4 | 0.59 | 3.13 | 931.3 | 0.58 |
| β -Pinene | 2.27 | 1066.8 | 0.04 | 3.73* | 971.1 | [0.32] |
| Sabinene | 2.46 | 1084.8 | 0.31 | 3.73* | 971.1 | [0.32] |
| Myrcene | 3.07 | 1133.6 | 2.00 | 4.07 | 993.6 | 1.97 |
| α -Phellandrene | 2.98 | 1126.1 | 0.03 | 4.22 | 1003.1 | 0.03 |
| Octanal | 4.66 | 1249.1 | 0.21 | 4.23 | 1004.0 | 0.22 |
| Limonene | 3.47 | 1163.4 | 93.63 | 4.68 | 1031.9 | 93.40 |
| (<i>E</i>)- β -Ocimene | 4.20 | 1216.9 | 0.10 | 4.98 | 1051.0 | 0.10 |
| Octanol | 8.42 | 1525.8 | 0.03 | 5.41 | 1077.9 | 0.02 |
| Terpinolene | 4.51 | 1238.6 | 0.02 | 5.55 | 1086.8 | 0.01 |
| Linalool | 8.30 | 1516.1 | 0.08 | 5.80 | 1102.6 | 0.07 |
| Nonanal | 6.11 | 1356.8 | 0.06 | 5.85 | 1105.5 | 0.07 |
| <i>trans</i> -Limonene oxide | 6.84 | 1408.8 | 0.01 | 6.32 | 1135.4 | 0.02 |
| Citronellal | 7.25 | 1438.4 | 0.07 | 6.61 | 1153.9 | 0.07 |
| β -Phellandrene | 3.51 | 1166.9 | 0.30 | | | |
| α -Terpineol | 10.03* | 1650.6 | [0.12] | 7.16 | 1189.2 | 0.04 |
| Decanal | 7.54 | 1459.7 | 0.20 | 7.43 | 1206.5 | 0.24 |
| <i>trans</i> -Carveol | 11.69 | 1788.0 | 0.01 | 7.56* | 1215.7 | [0.05] |
| Octyl acetate | 7.31 | 1443.3 | 0.04 | 7.56* | 1215.7 | [0.05] |
| Neral | 9.77* | 1630.2 | [0.03] | 7.93 | 1240.0 | 0.04 |
| Geranial | 10.36* | 1677.0 | [0.05] | 8.39 | 1271.2 | 0.06 |
| α -Terpinyl acetate | 9.95 | 1644.5 | 0.02 | 9.50 | 1347.8 | 0.02 |
| Limonene hydroperoxide IV | | | | 9.62 | 1355.8 | 0.03 |
| Neryl acetate | 10.42 | 1682.2 | 0.01 | 9.77 | 1366.7 | 0.01 |
| α -Copaene | 7.38 | 1447.8 | 0.11 | 9.85 | 1372.4 | 0.10 |
| Geranyl acetate | 10.80 | 1713.4 | 0.06 | 10.06* | 1387.2 | [0.12] |
| β -Cubebene | 8.01 | 1494.0 | 0.10 | 10.06* | 1387.2 | [0.12] |
| β -Elemene | 8.65* | 1543.0 | [0.30] | 10.10 | 1389.7 | 0.03 |
| Dodecanal | 10.26 | 1668.9 | 0.03 | 10.38 | 1410.1 | 0.03 |
| β -Caryophyllene | 8.65* | 1543.0 | [0.30] | 10.42 | 1413.3 | 0.29 |
| α -Humulene | 9.53 | 1610.8 | 0.05 | 10.88 | 1447.4 | 0.05 |
| (<i>E</i>)- β -Farnesene | 9.77* | 1630.2 | [0.03] | 11.04 | 1458.8 | 0.03 |
| Germacrene D | 10.03* | 1650.6 | [0.12] | 11.26 | 1475.5 | 0.10 |
| Bicyclgermacrene | 10.36* | 1677.0 | [0.05] | 11.47 | 1491.0 | 0.05 |
| α -Muurolene | 10.31 | 1673.0 | 0.03 | 11.55 | 1497.2 | 0.01 |
| δ -Cadinene | 10.66 | 1702.1 | 0.11 | 11.85 | 1520.0 | 0.12 |
| α -Elemol | 14.29 | 2022.9 | 0.03 | 12.18 | 1546.2 | 0.03 |
| Germacrene D-4-ol | 13.91 | 1987.0 | 0.02 | 12.48 | 1570.2 | 0.02 |
| Caryophyllene oxide | 13.03 | 1905.9 | 0.01 | 12.53 | 1573.9 | 0.01 |
| Nootkatone | 18.07 | 2412.0 | 0.08 | 15.15 | 1793.1 | 0.09 |
| Osthole | | | | 18.62 | 2123.4 | 0.07 |
| Oleic acid | | | | 18.79 | 2140.6 | 0.02 |

| | | | | |
|---|--------|-------|--------|------|
| Isoauraptene | | 19.54 | 2219.4 | 0.05 |
| Meranzin | | 19.60 | 2225.8 | 0.07 |
| Auraptene | | 22.86 | 2598.4 | 0.71 |
| Epoxyaurapten | | 23.89 | 2728.3 | 0.08 |
| Tangeretin | | 27.07 | 3142.1 | 0.04 |
| 3,3',4',5,6,7,8- Heptamethoxyflavone | | 29.12 | 3323.2 | 0.03 |
| Total reported | 98.89% | | 99.53% | |

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, only the first one is 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