

# Cypress, Blue Essential Oil

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SAMPLE IDENTIFICATION



**Internal code :** 17B16-FSE6-1-DM

**Customer identification :** Blue Cypress - Lot #EA0301-16

**Type :** Essential oil

**Source :** *Callitris intratropica*

**Customer :** Flowers Shining Everywhere Inc.



ANALYSIS

**Method :** PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

**Analyst :** Sylvain Mercier, M. Sc., chimiste

**Analysis date :** 2017-02-20



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.   |                    |
| Tricyclene                    | 3.31        | 914  | 0.04   | 0.04        | 930  | 1.16   | Monoterpene        |
| $\alpha$ -Thujene             | 3.39        | 919  | tr     | 0.01        | 968  | 1.32   | Monoterpene        |
| $\alpha$ -Pinene              | 3.50        | 926  | 0.84   | 0.78        | 955  | 1.27   | Monoterpene        |
| $\alpha$ -Fenchene            | 3.77        | 942  | 0.02   | 0.02        | 991  | 1.51   | Monoterpene        |
| Camphene                      | 3.79        | 943  | 0.06   | 0.05        | 998  | 1.58   | Monoterpene        |
| Thuja-2,4(10)-diene           | 3.87        | 948  | 0.02   | 0.02        | 1059 | 2.13*  | Monoterpene        |
| Sabinene                      | 4.20        | 967  | 0.01   | [0.02]      | 1059 | 2.13*  | Monoterpene        |
| $\beta$ -Pinene               | 4.28        | 972  | 0.02   | 0.02        | 1040 | 1.96   | Monoterpene        |
| Myrcene                       | 4.52        | 987  | tr     | 0.01        | 1117 | 2.72   | Monoterpene        |
| $\Delta^3$ -Carene            | 4.83*       | 1004 | 0.41   | 0.37        | 1097 | 2.45   | Monoterpene        |
| $\alpha$ -Phellandrene        | 4.83*       | 1004 | [0.41] | tr          | 1111 | 2.64   | Monoterpene        |
| $\alpha$ -Terpinene           | 5.01        | 1014 | 0.01   | 0.01        | 1125 | 2.82   | Monoterpene        |
| para-Cymene                   | 5.19        | 1024 | 0.07   | 0.07        | 1210 | 3.99   | Monoterpene        |
| Limonene                      | 5.24        | 1026 | 0.16   | 0.15        | 1143 | 3.06   | Monoterpene        |
| $\beta$ -Phellandrene         | 5.27        | 1028 | 0.02   | 0.05        | 1149 | 3.14*  | Monoterpene        |
| 1,8-Cineole                   | 5.32        | 1031 | 0.03   | [0.05]      | 1149 | 3.14*  | Monoterp. ether    |
| $\gamma$ -Terpinene           | 5.79        | 1056 | 0.01   | 0.01        | 1191 | 3.71   | Monoterpene        |
| <i>P. maritima</i> biomarker† | 6.10        | 1073 | 0.02   | 0.02        | 1439 | 8.00*  | Monoterp. alcohol  |
| Terpinolene                   | 6.19        | 1078 | 0.02   | 0.01        | 1220 | 4.15   | Monoterpene        |
| para-Cymenene                 | 6.45        | 1092 | 0.08   | 0.07        | 1368 | 6.45   | Monoterpene        |
| endo-Fenchol                  | 7.13        | 1117 | 0.02   | 0.02        | 1526 | 10.58  | Monoterp. alcohol  |
| Limona ketone                 | 7.33        | 1125 | 0.02   | 0.04        | 1451 | 8.30   | Monoterp. ketone   |
| trans-Pinocarveol             | 7.63        | 1135 | 0.11   | 0.11        | 1569 | 12.21  | Monoterp. alcohol  |
| Camphor                       | 7.71        | 1139 | 0.04   | 0.05        | 1426 | 7.68   | Monoterp. ketone   |
| Pinocamphone                  | 8.04        | 1150 | 0.02   | 0.02        | 1423 | 7.60   | Monoterp. ketone   |
| Borneol                       | 8.61        | 1171 | 0.12   | 0.12        | 1617 | 14.39  | Monoterp. alcohol  |
| Terpinen-4-ol                 | 8.84        | 1180 | 0.02   | 0.02        | 1530 | 10.73  | Monoterp. alcohol  |
| para-Cymen-8-ol               | 9.21        | 1193 | 0.04   | 0.03        | 1782 | 24.38  | Monoterp. alcohol  |
| Myrtenal                      | 9.44*       | 1198 | 0.53   | 0.13        | 1528 | 10.67  | Monoterp. aldehyde |
| $\alpha$ -Terpineol           | 9.44*       | 1198 | [0.53] | 2.57        | 1621 | 14.63* | Monoterp. alcohol  |
| Verbenone                     | 9.93        | 1209 | 0.19   | 1.06        | 1601 | 13.53* | Monoterp. ketone   |
| Eucaryone                     | 10.06       | 1212 | 0.04   |             |      |        | Monoterp. ketone   |
| 2-Carene-10-al?               | 11.34       | 1240 | 0.34   |             |      |        | Monoterp. aldehyde |
| 3-Carene-10-al?               | 11.48       | 1243 | 0.16   |             |      |        | Monoterp. aldehyde |
| Methyl myrtenate              | 13.91       | 1295 | 0.03   |             |      |        | Monoterp. ester    |
| $\alpha$ -Copaene             | 18.10       | 1359 | 0.02   | [0.02]      | 1439 | 8.00*  | Sesquiterpene      |
| $\beta$ -Elemene              | 19.18*      | 1375 | 3.79   | 1.43        | 1519 | 10.31* | Sesquiterpene      |
| Myrtenoic acid                | 19.18*      | 1375 | [3.79] | 3.47        | 2308 | 45.66  | Monoterp. acid     |
| $\beta$ -Caryophyllene        | 20.83       | 1399 | 0.09   | 0.09        | 1514 | 10.13  | Sesquiterpene      |
| $\alpha$ -Gualene             | 22.40       | 1418 | 0.54   | [1.43]      | 1519 | 10.31* | Sesquiterpene      |

|   |        |      |         |         |      |        |                          |
|---|--------|------|---------|---------|------|--------|--------------------------|
| Unknown (m/z = 79, 105 (70), 77 (68), 91 (66), 123 (62))                                | 22.74  | 1422 | 0.20    |         |      |        | Monoterp. acid           |
| $\alpha$ -Humulene  | 23.63* | 1432 | 0.57    | 0.19    | 1598 | 13.37  | Sesquiterpene            |
| Unknown (m/z = 79, 121 (78), 105 (77), 91 (66), 123 (51))                               | 23.63* | 1432 | [0.57]  |         |      |        | Monoterp. acid           |
| 4,5-diepi-Aristolochene   | 24.66  | 1445 | 0.13    | 1.16    | 1595 | 13.24* | Sesquiterpene            |
| Dehydroaromadendrene?   | 25.27  | 1452 | 1.71    | 1.61    | 1643 | 15.81  | Sesquiterpene            |
| Unknown (m/z = 189, 105 (80), 133 (77), 91 (76), 204 (51))                              | 25.43  | 1454 | 0.94    | [1.06]  | 1601 | 13.53* | Sesquiterpene            |
| Liguloxide or agarofuran analog   | 26.15  | 1463 | 1.12    | [1.16]  | 1595 | 13.24* | Sesquiterp. ether        |
| $\beta$ -Selinene   | 26.54  | 1467 | 2.64    | [2.57]  | 1621 | 14.63* | Sesquiterpene            |
| $\alpha$ -Selinene  | 27.17  | 1475 | 2.17    | 2.73    | 1628 | 15.01* | Sesquiterpene            |
| $\delta$ -Gualene   | 27.82  | 1483 | 0.56    | [2.73]  | 1628 | 15.01* | Sesquiterpene            |
| Selin-3,7(11)-diene   | 30.53  | 1519 | 0.13    | 0.09    | 1689 | 18.25  | Sesquiterpene            |
| $\alpha$ -Cadinene  | 30.64  | 1521 | 0.12    | 0.13    | 1697 | 18.68  | Sesquiterpene            |
| $\alpha$ -Elemol  | 32.61  | 1548 | 1.53    | 1.71    | 1989 | 36.97  | Sesquiterp. alcohol      |
| Guaiol  | 35.56  | 1589 | 12.15   | 12.24   | 2000 | 37.41  | Sesquiterp. alcohol      |
| Unknown (m/z = 161, 105 (52), 107 (47), 59 (44), 91 (43), 93 (42), 189 (41)... 222 (6)) | 35.93  | 1596 | 0.71    | 0.42    | 2018 | 37.99  | Oxygenated sesquiterpene |
| Rosifolol analog?   | 36.18  | 1602 | 0.31    | 0.34    | 2025 | 38.22  | Sesquiterp. alcohol      |
| Eremoligenol  | 36.78  | 1617 | 0.58    | 0.64    | 2073 | 39.74  | Sesquiterp. alcohol      |
| $\gamma$ -Eudesmol  | 37.05  | 1624 | 6.97    | 6.96    | 2067 | 39.53  | Sesquiterp. alcohol      |
| Hinesol   | 37.25  | 1628 | 0.28    | 0.21    | 2120 | 41.07  | Sesquiterp. alcohol      |
| $\beta$ -Eudesmol   | 38.01* | 1647 | 10.98   | 18.29   | 2112 | 40.87* | Sesquiterp. alcohol      |
| $\alpha$ -Eudesmol  | 38.01* | 1647 | [10.98] | 3.04    | 2114 | 40.93  | Sesquiterp. alcohol      |
| Selin-11-en-4- $\alpha$ -ol   | 38.09  | 1651 | 0.85    | 0.85    | 2134 | 41.45  | Sesquiterp. alcohol      |
| Bulnesol  | 38.50  | 1659 | 10.10   | [18.29] | 2112 | 40.87* | Sesquiterp. alcohol      |
| epi- $\beta$ -Bisabolol   | 38.92  | 1669 | 0.30    | 0.27    | 2079 | 39.91  | Sesquiterp. alcohol      |
| $\beta$ -Bisabolol  | 39.01  | 1671 | 0.15    | 0.22    | 2068 | 39.57  | Sesquiterp. alcohol      |
| Chamazulene   | 40.74  | 1720 | 0.21    | 0.17    | 2238 | 44.05  | Azulene                  |
| $\gamma$ -Costol  | 41.33  | 1739 | 1.93    | 1.81    | 2392 | 47.48  | Sesquiterp. alcohol      |
| Unknown (m/z = 91, 105 (71), 79 (52), 77 (50), 93 (47), 143 (47)... 218 (9))            | 41.50  | 1744 | 0.52    |         |      |        | Oxygenated sesquiterpene |
| $\beta$ -Costol   | 42.02  | 1760 | 1.39    | 2.55    | 2451 | 48.69* | Sesquiterp. alcohol      |
| Guaiazulene   | 42.15* | 1764 | 1.34    | 0.14    | 2262 | 44.62  | Azulene                  |
| $\alpha$ -Costol  | 42.15* | 1764 | [1.34]  | [2.55]  | 2451 | 48.69* | Sesquiterp. alcohol      |

|  |        |      |               |               |      |       |                     |
|--|--------|------|---------------|---------------|------|-------|---------------------|
| Unknown lactone (m/z = 233, 91 (76), 173 (66), 105 (54), 79 (47), 201 (46), 93 (44), 145 (44), 248 (41)) | 42.37  | 1771 | 0.31          | 0.29          | 2143 | 41.68 | Sesquiterp. lactone |
| Callitrin isomer   | 43.04  | 1792 | 0.71          | 0.49          | 2477 | 49.22 | Sesquiterp. lactone |
| Callitrin  | 43.69  | 1816 | 1.97          | 2.05          | 2488 | 49.42 | Sesquiterp. lactone |
| Callitrisin isomer I   | 44.63  | 1851 | 1.47          | 1.36          | 2505 | 49.77 | Sesquiterp. lactone |
| Unknown (m/z = 159, 133 (22), 91 (20), 119 (18), 105 (17), 232 (15))                                     | 45.51  | 1883 | 0.40          | 0.41          | 2526 | 50.17 | Sesquiterp. lactone |
| Dihydrocolumellarin  | 45.94  | 1899 | 13.40         | 13.45         | 2546 | 50.57 | Sesquiterp. lactone |
| Unknown (m/z = 219, 107 (33), 91 (29), 145 (24), 93 (23), 105 (22), 234 (20))                            | 46.05  | 1904 | 0.38          | 0.58          | 2563 | 50.90 | Sesquiterp. lactone |
| Columellarin isomer?   | 46.80  | 1934 | 1.87          | 2.06          | 2648 | 52.50 | Sesquiterp. lactone |
| Callitrisin isomer II  | 46.89  | 1937 | 0.53          | 0.53          | 2696 | 53.37 | Sesquiterp. lactone |
| Callitrisin  | 47.04* | 1943 | 1.34          | 0.80          | 2723 | 53.87 | Sesquiterp. lactone |
| Columellarin   | 47.04* | 1943 | [1.34]        | 0.58          | 2652 | 52.58 | Sesquiterp. lactone |
| Dihydrocallitrisin   | 47.24  | 1951 | 0.26          |               |      |       | Sesquiterp. lactone |
| <b>Total identified</b>  |        |      | <b>88.44%</b> | <b>87.54%</b> |      |       |                     |

\*: Two or more compounds are coeluting on this column

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

‡: Also found in a number of other species, including *C. intratropica*.

#### OTHER DATA

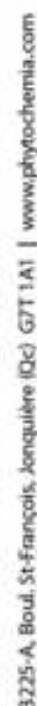
**Physical aspect** : Light blue liquid

**Refractive index** : 1.5050 ± 0.0003 (20 °C)

#### CONCLUSION

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

Report prepared for  
Flowers Shining Everywhere Inc.





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