

# ANALYSIS Spruce, Black Essential Oil

Laboratoire  
**Phyto**Chemia





#### SAMPLE IDENTIFICATION

**Internal code :** 16LD5-FSE23-1-DM

**Customer identification :** Black Spruce - Lot#HEB- PIMACAn04Qc2

**Type :** Essential oil

**Source :** Picea mariana

**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 :** 2016-12-15

Checked and approved by :



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



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IDENTIFIED COMPOUNDS

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| Identification                                       | Column: BPS |      |       | Column: WAX |      |        | Molecular Class     |
|--|-------------|------|-------|-------------|------|--------|---------------------|
|  | R.T.        | R.I. | %     | %           | R.I. | R.T.   |                     |
| $\alpha$ -Pinene                                     | 3.38        | 926  | 0.02  | 0.02        | 951  | 0.88   | Monoterpene         |
| Limonene   | 5.13        | 1029 | 0.01  | 0.01        | 1142 | 2.30   | Monoterpene         |
| $\delta$ -Elemene                                    | 19.21       | 1322 | 0.25  | 0.27        | 1431 | 6.25   | Sesquiterpene       |
| $\alpha$ -Copaene                                    | 17.57       | 1358 | 0.08  | 0.09        | 1450 | 6.60   | Sesquiterpene       |
| $\beta$ -Bourbonene                                  | 18.00       | 1365 | 0.32  | 0.31        | 1468 | 6.96   | Sesquiterpene       |
| $\beta$ -Elemene                                     | 18.87       | 1378 | 1.99  | 2.35        | 1536 | 8.37*  | Sesquiterpene       |
| $\beta$ -Caryophyllene                               | 20.48       | 1401 | 0.30  | [2.35]      | 1536 | 8.37*  | Sesquiterpene       |
| $\beta$ -Copaene                                     | 21.38       | 1412 | 0.08  | 0.08        | 1520 | 7.94   | Sesquiterpene       |
| $\gamma$ -Elemene                                    | 21.77       | 1417 | 0.12  | 0.12        | 1578 | 9.64   | Sesquiterpene       |
| 6,9-Guaiadiene                                       | 22.43       | 1425 | 0.06  | 0.07        | 1525 | 8.07   | Sesquiterpene       |
| $\alpha$ -Humulene                                   | 23.27       | 1435 | 0.12  | 0.07        | 1593 | 10.08  | Sesquiterpene       |
| $\gamma$ -Muurelene                                  | 24.97       | 1455 | 0.08  | 0.08        | 1624 | 11.03  | Sesquiterpene       |
| Germacrene D   | 25.50       | 1462 | 0.74  | 0.76        | 1635 | 11.43  | Sesquiterpene       |
| $\beta$ -Selinene                                    | 26.11       | 1489 | 0.43  | 0.43        | 1639 | 11.64  | Sesquiterpene       |
| $\alpha$ -Selinene                                   | 26.75       | 1476 | 0.38  | 0.37        | 1646 | 11.95  | Sesquiterpene       |
| Curzerene  | 27.61       | 1486 | 6.17  | 5.83        | 1774 | 18.20  | Sesquiterp. ether   |
| $\gamma$ -Cadinene                                   | 27.75       | 1488 | 1.56  | 1.90        | 1674 | 13.19* | Sesquiterpene       |
| $\delta$ -Cadinene                                   | 29.27       | 1508 | 0.29  | [1.90]      | 1674 | 13.19* | Sesquiterpene       |
| Germacrene B   | 31.99       | 1545 | 2.85  | 2.98        | 1734 | 15.87  | Sesquiterpene       |
| $\alpha$ -Elemol                                     | 32.74       | 1555 | 0.10  | 32.92       | 2004 | 32.59* | Sesquiterp. alcohol |
| Caryophyllene oxide                                  | 33.76       | 1569 | 0.05  | 0.07        | 1855 | 23.06  | Sesquiterp. ether   |
| (E)-Nerolidol  | 33.98       | 1572 | 0.44  | [32.92]     | 2004 | 32.59* | Sesquiterp. alcohol |
| cis- $\beta$ -Elemene                                | 35.79       | 1600 | 0.24  |             |      |        | Sesquiterp. ketone  |
| Furanoedesma-1,3-diene                               | 36.70       | 1622 | 23.56 | [32.92]     | 2004 | 32.59* | Sesquiterp. ether   |
| Lindestrene  | 36.97       | 1628 | 7.55  | [32.92]     | 2004 | 32.59* | Sesquiterp. ether   |
| $\epsilon$ -Cadinol                                  | 37.15       | 1638 | 0.43  | 19.54       | 2059 | 35.50* | Sesquiterp. alcohol |
| Isofuranogermacrene                                  | 37.89       | 1650 | 0.11  | [32.92]     | 2004 | 32.59* | Sesquiterp. ether   |
| $\alpha$ -Cadinol                                    | 37.93       | 1651 | 0.22  | 2.71        | 2133 | 38.00* | Sesquiterp. alcohol |
| Elemyl acetate                                       | 38.49       | 1665 | 0.56  | 0.47        | 1952 | 29.62  | Sesquiterp. ester   |
| Germacrene   | 38.68       | 1670 | 0.12  | 0.11        | 2074 | 36.04  | Sesquiterp. ketone  |
| Unidentified   | 39.41       | 1686 | 18.63 | [19.54]     | 2059 | 35.50* | Sesquiterp. ether   |
| furanoedesmane                                       |             |      |       |             |      |        |                     |
| 2-Methoxyfuranodiene                                 | 40.37       | 1714 | 2.75  | [2.71]      | 2133 | 38.00* | Sesquiterp. ether   |
| Unknown, not seen in MS                              | 44.01       | 1834 | 3.89  | 4.73        | 2313 | 42.64  |                     |
| 2-Acetoxyfuranodiene                                 | 45.60       | 1891 | 0.99  | 1.03        | 2451 | 45.57  | Sesquiterp. ester   |
| Unknown (m/z = 197, 108 (82), 43 (64), 212 (54), 169 | 48.51       | 2009 | 8.09  | 9.03        | 2640 | 49.09  | Diterpene           |

Essential oil, *Commiphora myrrha*  
Internal Code: 16L04-FSE24-1-OM

Customer Identification:  
Myrrh - Lot#861314

Report prepared for  
Flowers Shining Everywhere Inc.

|                                    |              |               |  |  |
|------------------------------------|--------------|---------------|--|--|
| (43), 79 (37), 183 (34)... 272 (9) |              |               |  |  |
| <b>Total identified</b>            | <b>71.6%</b> | <b>72.59%</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** : Bright yellow liquid

**Refractive Index** :  $1.5288 \pm 0.0003$  (20 °C)

#### CONCLUSION

No adulterant, contaminant or diluent were detected using this method. Please note that CO<sub>2</sub> extracts often contain a larger portion of unidentifiable compounds than essential oils.

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