



# Essential Oil University

## GC/MS Report

| Item                                                         | Lot                         |
|--------------------------------------------------------------|-----------------------------|
| <b>Douglas Fir EO Needle</b><br><i>Pseudotsuga menziesii</i> | <b>4G</b>                   |
| Date                                                         | Analyst                     |
| <b>1/24/2025</b>                                             | <b>Dr. Robert S. Pappas</b> |

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**The analysis of this batch sample, Douglas Fir EO Needle, meets the expected chemical profile for authentic essential oil of *Pseudotsuga menziesii*. No contamination or adulteration was detected. The results provided in this GCMS quality analysis reflect the chemical composition of the oil and lot referenced above on the date of analysis.**



## Sample Information

**Company:** Revive**Sample Name:** Douglas Fir EO Needle**Botanical Name:** *Pseudotsuga menziesii***Lot Number:** 4G**Production Method:** Steam distilled**Sample Type:** EO - Single**Country of Origin:** Canada**Analysis Date:** 1/24/2025**Manufacture Date:** September 2024

## GC/MS

**Inst. ID:** Shimadzu GCMS-QP2010Ultra**Injection Type:** Split**Split Ratio:** 24.4**Column Type:** ZB-5**Injection Volume:** 0.1 µL**Temperature Program:** 2C/min

## Physical Data

### ANALYSIS

Optical Rotation @20°C

Refractive Index @20°C

Specific Gravity @20°C

### METHOD

USP[781]

USP[831]

USP[841]

### RESULTS

-17.32

1.47510

0.86730



| Ret. Time | Component                | Ret. Idx. | Conc. % |      |
|-----------|--------------------------|-----------|---------|------|
| 4.362     | Unidentified             | 679       | 0.01%   |      |
| 8.343     | Ethyl 2-methylbutyrate   | 842       | 0.02%   |      |
| 9.756     | Santene                  | 879       | 0.02%   |      |
| 11.700    | Tricyclene               | 921       | 0.08%   |      |
| 11.853    | alpha-Thujene            | 924       | 0.83%   |      |
| 12.270    | alpha-Pinene             | 931       | 11.42%  |      |
| 13.052    | alpha-Fenchene           | 945       | 0.03%   |      |
| 13.150    | Camphene                 | 947       | 0.8%    |      |
| 13.352    | Unidentified             | 951       | 0.01%   |      |
| 14.432    | Sabinene                 | 970       | 9.85%   |      |
| 14.763    | beta-Pinene              | 976       | 30.6%   |      |
| 15.211    | para-Menth-3-ene         | 985       | 0.01%   |      |
| 15.349    | Myrcene                  | 987       | 2.11%   |      |
| 15.883    | Ethyl hexanoate          | 997       | 0.06%   |      |
| 16.254    | Pseudolimonene           | 1003      | 0.03%   |      |
| 16.403    | alpha-Phellandrene       | 1005      | 0.31%   |      |
| 16.557    | delta-3-Carene           | 1008      | 4.52%   |      |
| 16.915    | 1,4-Cineole              | 1013      | 0.1%    |      |
| 17.062    | alpha-Terpinene          | 1015      | 2.75%   |      |
| 17.537    | para-Cymene              | 1023      | 0.43%   |      |
| 17.838    | Limonene                 | 1027      | 2.67%   | IFRA |
| 17.934    | beta-Phellandrene        | 1029      | 1.39%   |      |
| 18.232    | cis-beta-Ocimene         | 1033      | 0.2%    |      |
| 18.916    | trans-beta-Ocimene       | 1044      | 0.15%   |      |
| 19.312    | Unidentified             | 1050      | 0.05%   |      |
| 19.710    | gamma-Terpinene          | 1056      | 4.9%    |      |
| 20.233    | Unidentified             | 1064      | 0.01%   |      |
| 20.469    | Unidentified             | 1068      | 0.02%   |      |
| 20.604    | Unidentified             | 1070      | 0.01%   |      |
| 21.545    | Terpinolene              | 1084      | 14.8%   |      |
| 21.828    | para-Cymenene            | 1088      | 0.2%    |      |
| 22.453    | Linalool                 | 1098      | 0.05%   | IFRA |
| 23.365    | 1,3,8-para-Menthatriene  | 1111      | 0.03%   |      |
| 23.771    | endo-Fenchol             | 1117      | 0.07%   |      |
| 24.130    | cis-para-Menth-2-en-1-ol | 1122      | 0.1%    |      |
| 24.845    | Unidentified             | 1133      | 0.01%   |      |
| 24.913    | Unidentified             | 1134      | 0.02%   |      |
| 25.246    | Unidentified             | 1139      | 0.03%   |      |
| 25.381    | Unidentified             | 1141      | 0.08%   |      |
| 25.790    | Unidentified             | 1147      | 0.02%   |      |



| Ret. Time | Component           | Ret. Idx. | Conc. % |      |
|-----------|---------------------|-----------|---------|------|
| 26.045    | Citronellal         | 1150      | 0.2%    | IFRA |
| 26.228    | Unidentified        | 1153      | 0.02%   |      |
| 26.481    | Unidentified        | 1157      | 0.01%   |      |
| 27.388    | Borneol             | 1170      | 0.04%   |      |
| 27.683    | Unidentified        | 1174      | 0.01%   |      |
| 27.872    | Unidentified        | 1177      | 0.02%   |      |
| 28.016    | Terpinen-4-ol       | 1179      | 4.45%   |      |
| 28.426    | Unidentified        | 1185      | 0.04%   |      |
| 28.808    | Unidentified        | 1190      | 0.01%   |      |
| 29.002    | alpha-Terpineol     | 1193      | 0.66%   |      |
| 29.116    | Ethyl octanoate     | 1195      | 0.08%   |      |
| 29.321    | Unidentified        | 1198      | 0.01%   |      |
| 29.963    | trans-Piperitol     | 1207      | 0.02%   |      |
| 31.149    | Citronellol         | 1225      | 1.03%   | IFRA |
| 31.361    | Unidentified        | 1228      | 0.03%   |      |
| 31.860    | Unidentified        | 1235      | 0.01%   |      |
| 32.751    | Unidentified        | 1248      | 0.04%   |      |
| 34.183    | Unidentified        | 1269      | 0.02%   |      |
| 34.348    | Unidentified        | 1271      | 0.02%   |      |
| 35.064    | Bornyl acetate      | 1282      | 0.39%   |      |
| 35.225    | Unidentified        | 1284      | 0.01%   |      |
| 36.517    | Unidentified        | 1303      | 0.01%   |      |
| 37.635    | Unidentified        | 1320      | 0.01%   |      |
| 37.724    | Methyl decanoate    | 1322      | 0.04%   |      |
| 38.471    | Unidentified        | 1333      | 0.01%   |      |
| 39.407    | Citronellyl acetate | 1348      | 2.18%   | IFRA |
| 41.263    | Geranyl acetate     | 1376      | 1.42%   |      |
| 42.016    | beta-Elemene        | 1387      | 0.02%   |      |
| 42.394    | Ethyl decanoate     | 1393      | 0.05%   |      |
| 43.790    | Unidentified        | 1415      | 0.01%   |      |
| 43.907    | Unidentified        | 1417      | 0.02%   |      |
| 46.154    | alpha-Humulene      | 1453      | 0.05%   |      |
| 47.638    | Unidentified        | 1477      | 0.02%   |      |
| 47.754    | Germacrene D        | 1479      | 0.02%   |      |
| 48.629    | Unidentified        | 1493      | 0.01%   |      |
| 48.675    | Unidentified        | 1493      | 0.01%   |      |
| 49.112    | Unidentified        | 1500      | 0.01%   |      |
| 49.210    | Unidentified        | 1502      | 0.01%   |      |
| 49.705    | Unidentified        | 1510      | 0.01%   |      |
| 50.024    | delta-Cadinene      | 1516      | 0.04%   |      |



| Ret. Time | Component    | Ret. Idx. | Conc. % |  |
|-----------|--------------|-----------|---------|--|
| 51.804    | Unidentified | 1546      | 0.01%   |  |
| 56.153    | Unidentified | 1620      | 0.07%   |  |
| 56.431    | Unidentified | 1625      | 0.04%   |  |
| 57.969    | Unidentified | 1652      | 0.02%   |  |

Total Identified Compounds **99.22 %**

