

Table S1

Constituents and concentrations of *J. communis* extracted using the Clevenger and Commercial extraction methods.

| Constituent Number | Volatile constituents | RI | Concentration min-max range (%) Clevenger | Concentration min-max range (%) Commercial |
|--------------------|------------------------|------|--|---|
| 1 | α -Thujene | 931 | 0.98 - 1.48 | 1.01 - 1.55 |
| 2 | α -Pinene | 939 | 26.81 - 35.59 | 26.48 - 35.34 |
| 3 | Camphene | 953 | 0.29 - 0.31 | 0.30 - 0.33 |
| 4 | Sabinene | 969 | 8.94 - 9.41 | 9.16 - 9.89 |
| 5 | β -Pinene | 974 | 1.63 - 1.71 | 1.67 - 1.80 |
| 6 | β -Myrcene | 991 | 4.27 - 4.49 | 4.37 - 4.72 |
| 7 | β -Fellandrene | 1005 | 0.11 - 0.61 | 0.12 - 0.64 |
| 8 | α -Terpinene | 1018 | 0.8 - 0.84 | 0.82 - 0.88 |
| 9 | p-Cymene | 1025 | 0.88 - 0.92 | 0.90 - 0.97 |
| 10 | Limonene | 1031 | 2.07 - 6.96 | 2.12 - 7.31 |
| 11 | γ -Terpinene | 1062 | 1.42 - 1.47 | 1.45 - 1.54 |
| 12 | α -Terpinolene | 1088 | 0.92 - 1.09 | 0.95 - 1.15 |
| 13 | β -Linalool | 1096 | 0.81 - 1.00 | 0.83 - 1.06 |
| 14 | Terpinene-4-ol | 1177 | 3.83 - 4.97 | 3.93 - 5.22 |
| 15 | p-Cymene-8-ol | 1182 | 0.18 - 0.85 | 0.19 - 0.89 |
| 16 | α -Terpineol | 1189 | 0.71 - 0.74 | 0.72 - 0.78 |
| 17 | Bornyl acetate | 1285 | 0.31 - 0.64 | 0.31 - 0.67 |
| 18 | α -Cubebene | 1351 | 0.28 - 0.92 | 0.29 - 0.97 |
| 19 | α -Copaene | 1376 | 0.49 - 0.66 | 0.50 - 0.69 |
| 20 | β -Elemene | 1390 | 0.32 - 1.11 | 0.33 - 1.17 |
| 21 | β -Caryophyllene | 1419 | 2.33 - 3.56 | 2.39 - 3.74 |
| 22 | γ -Elemene | 1433 | 0.19 - 0.37 | 0.20 - 0.39 |
| 23 | α -Humulene | 1454 | 1.29 - 2.63 | 1.32 - 2.76 |
| 24 | γ -Muurolene | 1479 | 0.45 - 0.21 | 0.21 - 0.48 |
| 25 | Germacrene D | 1480 | 7.27 - 8.57 | 6.45 - 6.95 |
| 26 | Elixene | 1493 | 0.92 - 3.29 | 0.94 - 3.45 |
| 27 | γ -Cadinene | 1513 | 1.51 - 1.55 | 1.55 - 1.63 |
| 28 | δ -Cadinene | 1524 | 4.49 - 6.10 | 4.12 - 6.41 |
| 29 | (-)-Spathulenol | 1578 | 1.00 - 2.06 | 1.03 - 2.16 |
| 30 | Caryophyllene oxide | 1582 | 2.42 - 2.54 | 2.25 - 2.64 |
| 31 | δ -Cadinol | 1619 | n.d. | 0.96 - 1.08 |
| 32 | tau.-Cadinol | 1634 | n.d. | 0.48 - 0.75 |
| 33 | tau.-Muurolol | 1638 | n.d. | 0.33 - 0.67 |
| 34 | α -Cadinol | 1641 | n.d. | 0.73 - 0.95 |
| 35 | Manoyl oxide | 1992 | 0.63 - 3.52 | 0.65 - 3.70 |

n.d. = not detected.

Table S2

Constituents and concentrations of *J. sibirica* extracted using the Clevenger and Commercial extraction methods.

| Constituent Number | Volatile constituents | RI | Concentration min-max range (%) Clevenger | Concentration min-max range (%) Commercial |
|--------------------|----------------------------|------|--|---|
| 1 | α -Thujene | 931 | 1.29 - 1.36 | 1.32 - 1.42 |
| 2 | α -Pinene | 939 | 15.38 - 20.51 | 14.69 - 20.38 |
| 3 | Camphene | 953 | 0.14 - 0.17 | 0.14 - 0.17 |
| 4 | Sabinene | 969 | 13.25 - 14.91 | 13.52 - 15.56 |
| 5 | β -Pinene | 974 | 0.57 - 0.66 | 0.58 - 0.69 |
| 6 | β -Myrcene | 991 | 1.03 - 1.16 | 1.05 - 1.21 |
| 7 | δ -2-Carene | 1001 | 0.79 - 1.26 | 0.81 - 1.32 |
| 8 | δ -3-Carene | 1007 | 0.55 - 1.82 | 0.56 - 1.90 |
| 9 | α -Terpinene | 1018 | 0.15 - 0.61 | 0.15 - 0.63 |
| 10 | p-Cymene | 1025 | 0.49 - 0.61 | 0.50 - 0.64 |
| 11 | Limonene | 1031 | 1.20 - 1.23 | 1.23 - 1.28 |
| 12 | β -Phelandrene | 1033 | 0.17 - 0.53 | 0.17 - 0.56 |
| 13 | trans- β -Ocimene | 1050 | 0.34 - 0.69 | 0.35 - 0.72 |
| 14 | γ -Terpinene | 1062 | 1.11 - 1.23 | 1.13 - 1.28 |
| 15 | α -Terpinolene | 1088 | 1.18 - 1.33 | 1.20 - 1.39 |
| 16 | Terpinene-4-ol | 1177 | 3.41 - 3.54 | 3.48 - 3.70 |
| 17 | Bornyl acetate | 1285 | 0.33 - 0.42 | 0.33 - 0.44 |
| 18 | Myrtenyl acetate | 1298 | 0.26 - 0.28 | 0.26 - 0.29 |
| 19 | α -Terpinyl acetate | 1337 | 0.30 - 0.39 | 0.31 - 0.40 |
| 20 | α -Copaene | 1378 | 1.08 - 4.23 | 1.10 - 4.41 |
| 21 | β -Elemene | 1390 | 1.02 - 6.59 | 1.04 - 6.88 |
| 22 | β -Caryophyllene | 1419 | 1.02 - 1.22 | 1.04 - 1.25 |
| 23 | γ -Elemene | 1433 | 0.61 - 5.67 | 0.62 - 5.92 |
| 24 | α -Humulene | 1454 | 1.13 - 1.33 | 1.15 - 1.39 |
| 25 | Germacrene D | 1480 | 9.75 - 13.65 | 8.94 - 13.22 |
| 26 | Elixene | 1493 | 0.61 - 1.84 | 0.62 - 1.92 |
| 27 | α -Muurolene | 1495 | 0.55 - 0.78 | 0.56 - 0.82 |
| 28 | γ -Cadinene | 1513 | 0.49 - 1.28 | 0.50 - 1.33 |
| 29 | δ -Cadinene | 1524 | 5.80 - 6.45 | 5.91 - 6.73 |
| 30 | α -Cadinene | 1538 | 0.74 - 0.84 | 0.76 - 0.88 |
| 31 | Germacrene B | 1556 | 0.33 - 0.52 | 0.34 - 0.54 |
| 32 | trans-Nerolidol | 1561 | 1.95 - 3.99 | 1.98 - 4.17 |
| 33 | Germacrene D-4-ol | 1575 | 1.90 - 7.68 | 1.93 - 8.02 |
| 34 | δ -Cadinol | 1619 | 0.73 - 0.92 | 0.75 - 0.96 |
| 35 | tau.-Cadinol | 1634 | 0.57 - 1.13 | 0.58 - 1.18 |
| 36 | tau.-Muurolol | 1638 | 1.25 - 1.33 | 1.28 - 1.36 |
| 37 | α -Cadinol | 1641 | 1.44 - 2.85 | 1.46 - 2.98 |
| 38 | Farnesol | 1692 | 0.38 - 0.79 | 0.39 - 0.83 |
| 39 | Farnesal | 1707 | 0.24 - 0.35 | 0.25 - 0.37 |
| 40 | Cembrene | 1931 | 1.19 - 1.22 | 1.21 - 1.27 |
| 41 | Totarol | 2269 | 0.47 - 0.54 | 0.48 - 0.56 |

Table S3

Constituents and concentrations of *J. pygmaea* extracted using the Clevenger and Commercial extraction methods.

| Constituent Number | Volatile constituents | RI | Concentration min-max range (%) Clevenger | Concentration min-max range (%) Commercial |
|--------------------|------------------------|------|--|---|
| 1 | α -Thujene | 931 | 1.29 - 2.64 | 1.31 - 2.69 |
| 2 | α -Pinene | 939 | 20.99 - 22.18 | 19.41 - 22.14 |
| 3 | Camphene | 953 | 0.17 - 0.19 | 0.18 - 0.20 |
| 4 | Sabinene | 969 | 15.62 - 25.26 | 14.94 - 25.36 |
| 5 | β -Pinene | 974 | 2.24 - 4.4 | 2.28 - 4.59 |
| 6 | β -Myrcene | 991 | 1.02 - 1.50 | 1.04 - 1.57 |
| 7 | α -Phelandrene | 1005 | 0.41 - 0.77 | 0.42 - 0.80 |
| 8 | δ -3-Carene | 1007 | 0.14 - 0.17 | 0.14 - 0.18 |
| 9 | α -Terpinene | 1018 | 0.83 - 1.53 | 0.85 - 1.59 |
| 10 | p-Cymene | 1025 | 0.96 - 1.24 | 0.97 - 1.30 |
| 11 | Limonene | 1031 | 1.43 - 2.08 | 1.46 - 2.18 |
| 12 | β -Phelandrene | 1033 | 2.68 - 4.95 | 2.73 - 5.17 |
| 13 | γ -Terpinene | 1062 | 1.52 - 2.67 | 1.55 - 2.79 |
| 14 | cis-Sabinene hydrate | 1068 | 0.12 - 0.16 | 0.13 - 0.17 |
| 15 | α -Terpinolene | 1088 | 1.04 - 1.86 | 1.06 - 1.94 |
| 16 | β -Linalool | 1096 | 0.40 - 0.45 | 0.41 - 0.47 |
| 17 | trans-Sabinene hydrate | 1098 | 0.20 - 0.22 | 0.21 - 0.23 |
| 18 | Borneol | 1169 | 0.31 - 0.37 | 0.32 - 0.38 |
| 19 | Terpinene-4-ol | 1177 | 3.19 - 5.83 | 3.05 - 6.09 |
| 20 | α -Terpineol | 1189 | 0.40 - 0.60 | 0.41 - 0.63 |
| 21 | Myrtenol | 1198 | 0.21 - 0.25 | 0.22 - 0.27 |
| 22 | trans-Carveol | 1219 | 0.19 - 0.24 | 0.20 - 0.25 |
| 23 | Citronellol | 1227 | 0.23 - 0.26 | 0.23 - 0.28 |
| 24 | Bornyl acetate | 1285 | 0.36 - 0.42 | 0.37 - 0.44 |
| 25 | Myrtenyl acetate | 1298 | 0.28 - 0.36 | 0.28 - 0.37 |
| 26 | α -Copaene | 1376 | 0.30 - 0.51 | 0.31 - 0.53 |
| 27 | β -Elemene | 1390 | 1.07 - 4.62 | 1.09 - 4.83 |
| 28 | β -Caryophyllene | 1419 | 0.90 - 3.09 | 0.92 - 3.22 |
| 29 | α -Humulene | 1454 | 0.52 - 2.89 | 0.53 - 3.01 |
| 30 | γ -Muurolene | 1479 | 0.32 - 1.36 | 0.33 - 1.42 |
| 31 | Germacrene D | 1480 | 2.43 - 11.06 | 2.48 - 11.55 |
| 32 | Elixene | 1493 | 0.70 - 1.41 | 0.72 - 1.47 |
| 33 | γ -Cadinene | 1513 | 1.40 - 3.13 | 1.43 - 3.27 |
| 34 | δ -Cadinene | 1524 | 2.03 - 5.01 | 2.08 - 5.23 |
| 35 | trans-Nerolidol | 1561 | 0.61 - 2.52 | 0.62 - 2.63 |
| 36 | Germacrene D-4-ol | 1575 | 0.16 - 1.38 | 0.16 - 1.44 |
| 37 | (-)-Spathulenol | 1578 | 0.43 - 1.00 | 0.44 - 1.05 |
| 38 | Caryophyllene oxide | 1582 | 1.06 - 2.82 | 1.08 - 2.94 |
| 39 | δ -Cadinol | 1619 | 0.24 - 0.49 | 0.25 - 0.51 |
| 40 | tau.-Cadinol | 1634 | 0.21 - 0.61 | 0.21 - 0.63 |
| 41 | α -Cadinol | 1641 | 1.77 - 2.71 | 1.45 - 2.83 |

Table S4

Constituents and concentrations of *J. oxycedrus* extracted using the Clevenger and Commercial extraction methods.

| Constituent Number | Volatile constituents | RI | Concentration min-max range (%) Clevenger | Concentration min-max range (%) Commercial |
|--------------------|------------------------|------|--|---|
| 1 | Tricyclene | 922 | 0.15 - 0.17 | 0.15 - 0.18 |
| 2 | α -Pinene | 939 | 27.84 - 33.79 | 26.53 - 32.74 |
| 3 | Camphene | 953 | 0.24 - 0.25 | 0.25 - 0.27 |
| 4 | Sabinene | 969 | 0.93 - 1.51 | 0.95 - 1.60 |
| 5 | β -Pinene | 974 | 0.44 - 3.81 | 0.45 - 4.04 |
| 6 | β -Myrcene | 991 | 0.39 - 3.07 | 0.40 - 3.26 |
| 7 | α -Terpinene | 1018 | 0.19 - 0.33 | 0.13 - 0.35 |
| 8 | p-Cymene | 1025 | 0.27 - 1.31 | 0.27 - 1.39 |
| 9 | Limonene | 1031 | 2.99 - 4.79 | 3.06 - 5.09 |
| 10 | γ -Terpinene | 1062 | 0.49 - 0.51 | 0.50 - 0.54 |
| 11 | α -Terpinolene | 1088 | 0.47 - 0.50 | 0.48 - 0.53 |
| 12 | β -Linalool | 1096 | 0.36 - 0.38 | 0.37 - 0.41 |
| 13 | α -Campholenal | 1121 | 1.57 - 1.65 | 1.61 - 1.75 |
| 14 | trans-Pinocarveol | 1136 | 0.20 - 0.21 | 0.21 - 0.23 |
| 15 | trans-Verbenol | 1141 | 0.28 - 0.29 | 0.28 - 0.31 |
| 16 | Borneol | 1169 | 0.17 - 0.18 | 0.17 - 0.19 |
| 17 | Terpinene-4-ol | 1177 | 0.31 - 0.33 | 0.32 - 0.35 |
| 18 | p-Cymene-8-ol | 1182 | 0.42 - 0.44 | 0.43 - 0.47 |
| 19 | Myrtenal | 1185 | 0.70 - 0.73 | 0.71 - 0.78 |
| 20 | Myrtenol | 1187 | 0.66 - 0.70 | 0.68 - 0.74 |
| 21 | α -Terpineol | 1189 | 0.76 - 0.80 | 0.78 - 0.85 |
| 22 | Verbenone | 1208 | 0.44 - 0.46 | 0.45 - 0.49 |
| 23 | Bornyl acetate | 1285 | 0.63 - 0.66 | 0.65 - 0.70 |
| 24 | Myrtenyl acetate | 1298 | 0.56 - 0.59 | 0.57 - 0.62 |
| 25 | α -Copaene | 1376 | 0.78 - 0.82 | 0.79 - 0.87 |
| 26 | β -Elemene | 1390 | 0.87 - 0.91 | 0.89 - 0.97 |
| 27 | β -Caryophyllene | 1419 | 0.97 - 2.02 | 0.99 - 2.15 |
| 28 | γ -Elemene | 1433 | 0.51 - 0.71 | 0.53 - 0.76 |
| 29 | α -Humulene | 1454 | 0.33 - 1.41 | 0.34 - 1.50 |
| 30 | α -Curcumene | 1477 | 0.89 - 3.30 | 0.91 - 3.50 |
| 31 | Germacrene D | 1480 | 3.52 - 17.02 | 3.60 - 18.06 |
| 32 | α -Muurolene | 1499 | 0.25 - 0.48 | 0.26 - 0.51 |
| 33 | γ -Cadinene | 1513 | 3.87 - 4.24 | 3.89 - 4.10 |
| 34 | δ -Cadinene | 1524 | 3.04 - 4.17 | 2.93 - 4.42 |
| 35 | α -Cadinene | 1537 | 0.18 - 0.68 | 0.18 - 0.72 |
| 36 | α -Calacorene | 1549 | 0.92 - 1.92 | 0.94 - 2.04 |
| 37 | trans-Nerolidol | 1561 | 0.81 - 3.81 | 0.83 - 4.04 |
| 38 | (-)-Spathulenol | 1578 | 0.53 - 0.95 | 0.54 - 0.97 |
| 39 | Caryophyllene oxide | 1582 | 0.77 - 0.87 | 0.79 - 0.93 |
| 40 | α -Cedrol | 1598 | 0.41 - 0.87 | 0.42 - 0.92 |
| 41 | δ -Cadinol | 1619 | 0.76 - 0.93 | 0.77 - 0.96 |
| 42 | tau.-Cadinol | 1634 | 0.80 - 1.50 | 0.82 - 1.59 |
| 43 | tau.-Muurolol | 1638 | 0.81 - 0.91 | 0.83 - 0.97 |
| 44 | α -Cadinol | 1641 | 0.63 - 0.76 | 0.64 - 0.80 |
| 45 | Manoyl oxide | 1992 | 4.03 - 20.18 | 4.13 - 21.41 |

Table S5

Main class of compounds in the essential oil (EO) of *J. oxycedrus*, *J. communis*, *J. pygmaea*, *J. sibirica*.

| Species/ Method/Sex | | Class | | | | | | | | | | | | | |
|------------------------|---|--------------|------|------|------|------|------|----------------|-------|------|-------|------|------|------------|-------|
| | | Monoterpenes | | | | | | Sesquiterpenes | | | | | | Diterpenes | |
| | | MH | BOM | OM | BM | PhM | MOM | SH | OS | TOS | BSH | OBS | ASH | MD | OD |
| <i>J. communis</i> | | | | | | | | | | | | | | | |
| ClevA | F | 58.5 | - | 8.19 | - | 0.92 | - | 12.47 | - | 2.06 | 10.07 | 2.42 | - | - | 0.63 |
| | M | 53.6 | - | 5.84 | - | 0.88 | - | 11.90 | - | 1.01 | 14.06 | 2.54 | - | - | 3.52 |
| SCom | F | 58.0 | - | 8.40 | - | 0.94 | - | 11.78 | - | 2.10 | 10.32 | 4.98 | - | - | 0.65 |
| | M | 54.0 | - | 5.98 | - | 0.89 | - | 10.02 | - | 1.03 | 14.41 | 5.96 | - | - | 3.61 |
| <i>J. oxycedrus</i> | | | | | | | | | | | | | | | |
| ClevA | M | 36.4 | 3.60 | 3.37 | - | 1.31 | - | 9.05 | - | 1.81 | 15.47 | 4.87 | - | - | 20.18 |
| | F | 46.1 | 3.42 | 3.21 | - | 0.26 | - | 20.27 | - | 0.94 | 13.62 | 3.87 | - | - | 4.03 |
| SCom | M | 35.3 | 3.69 | 3.46 | - | 1.35 | - | 9.28 | - | 1.86 | 15.38 | 4.99 | - | - | 20.69 |
| | F | 44.3 | 3.51 | 3.28 | - | 0.27 | - | 20.78 | - | 0.96 | 13.96 | 3.97 | - | - | 4.13 |
| <i>J. sibirica</i> | | | | | | | | | | | | | | | |
| ClevA | M | 43.6 | 0.70 | 3.41 | 1.33 | 0.61 | 5.63 | 20.45 | 3.84 | - | 10.68 | 4.03 | 0.62 | 1.22 | - |
| | F | 36.6 | 0.58 | 3.54 | 3.08 | 0.48 | 7.97 | 12.53 | 11.68 | - | 1.94 | 6.15 | 1.15 | 1.18 | - |
| SCom | M | 43.5 | 0.72 | 3.48 | 1.36 | 0.62 | 5.75 | 19.85 | 3.92 | - | 10.87 | 4.12 | 0.63 | 1.24 | - |
| | F | 36.3 | 0.59 | 3.61 | 3.14 | 0.49 | 8.19 | 11.78 | 11.91 | - | 11.16 | 6.27 | 1.17 | 1.21 | - |
| <i>J. pygmaea</i> | | | | | | | | | | | | | | | |
| ClevA | M | 67.0 | 1.16 | 7.11 | 0.13 | 1.24 | 0.19 | 4.50 | 9.29 | 1.00 | 5.69 | - | - | - | - |
| | F | 53.0 | 1.39 | 4.25 | 0.17 | 0.96 | 0.24 | 17.60 | 5.27 | 0.43 | 11.55 | - | - | - | - |
| SCom | M | 65.4 | 1.19 | 7.25 | 0.14 | 1.27 | 0.20 | 4.58 | 9.47 | 1.02 | 5.81 | - | - | - | - |
| | F | 52.0 | 1.43 | 4.14 | 0.17 | 0.97 | 0.24 | 17.95 | 5.38 | 0.44 | 11.78 | - | - | - | - |

MH = monoterpenes hydrocarbons; OM = oxygenated monoterpenes; PhM = Phenolic monoterpenes; BM = Bicyclic monoterpenes; MOM = Monocyclic oxygenated monoterpenes; SH = sesquiterpenes hydrocarbons; OS = oxygenated sesquiterpenes; TOS = tricyclic oxygenated sesquiterpenes; BSH = bicyclic sesquiterpene hydrocarbons; OBS = oxygenated bicyclic sesquiterpenes; ASH = Acyclic sesquiterpenes hydrocarbons; D = diterpenes; OD = oxygenated diterpenes.