

Essential oil composition and bioactivity of two Junipers species from Bulgaria and Slovakia

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Supplemental Tables

Supplemental Table 1. Average concentration of volatile constituents (% in air-dried biomass) of *Juniperus excelsa* collected in Bulgaria.

| Constituent number | Volatile constituents of <i>J. excelsa</i> | RI | BR1 | BR2 | IG1 | IG2 | KG1 |
|---|--|------|--|-------|-------|-------|-------|
| --- % of total oil by total peak area ----- | | | | | | | |
| 1 | α -Thujene | 931 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| 2 | α -Pinene | 939 | 20.4 | 21.31 | 19.71 | 22.53 | 20.32 |
| 3 | Camphene | 953 | 0.40 | 0.42 | 0.43 | 0.39 | 0.44 |
| 4 | Sabinene | 969 | 0.03 | 0.04 | 0.04 | 0.03 | 0.04 |
| 5 | β -Pinene | 974 | 2.86 | 2.99 | 3.04 | 2.77 | 3.13 |
| 6 | β -Myrcene | 991 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 7 | α -Terpinene | 1018 | 0.03 | 0.04 | 0.04 | 0.03 | 0.04 |
| 8 | α -Limonene | 1031 | 24.73 | 24.14 | 25.33 | 26.15 | 26.36 |
| 9 | γ -Terpinene | 1062 | 0.23 | 0.25 | 0.25 | 0.23 | 0.26 |
| 10 | α -Terpinolene | 1088 | 0.17 | 0.18 | 0.18 | 0.16 | 0.19 |
| 11 | β -Linalool | 1096 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 12 | Terpinen-4-ol | 1177 | 0.60 | 0.63 | 0.64 | 0.58 | 0.66 |
| 13 | α -Terpineol | 1189 | 0.33 | 0.35 | 0.36 | 0.33 | 0.37 |
| 14 | Bornyl acetate | 1285 | 0.11 | 0.12 | 0.12 | 0.12 | 0.13 |
| 15 | α -Cubebene | 1351 | 0.58 | 0.61 | 0.61 | 0.56 | 0.64 |
| 16 | α -Copaene | 1376 | 0.21 | 0.22 | 0.22 | 0.21 | 0.24 |
| 17 | β -Bourbunene | 1384 | 0.10 | 0.10 | 0.10 | 0.09 | 0.11 |
| 18 | β -Elemene | 1390 | 0.21 | 0.22 | 0.22 | 0.20 | 0.23 |
| 19 | β -Caryophyllene | 1419 | 0.43 | 0.44 | 0.45 | 0.41 | 0.46 |
| 20 | γ -Elemene | 1433 | 0.35 | 0.37 | 0.37 | 0.34 | 0.38 |
| 21 | α -Humulene | 1454 | 0.22 | 0.22 | 0.23 | 0.21 | 0.24 |
| 22 | γ -Muurolene | 1479 | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 |
| 23 | Germacrene D | 1480 | 2.18 | 2.28 | 2.30 | 2.12 | 2.39 |
| 24 | γ -Cadinene | 1513 | 0.77 | 0.81 | 0.83 | 0.76 | 0.85 |
| 25 | δ -Cadinene | 1524 | 3.54 | 3.33 | 3.40 | 3.10 | 3.50 |
| 26 | Germacrene B | 1556 | 1.33 | 1.39 | 1.41 | 1.29 | 1.45 |
| 27 | Caryophyllene oxide | 1579 | 3.84 | 4.02 | 3.89 | 3.74 | 4.21 |
| 28 | α -Cedrol | 1598 | 30.83 | 31.71 | 32.33 | 29.09 | 29.79 |
| 29 | 1-epi-Cubenol | 1627 | 2.27 | 2.38 | 2.42 | 2.21 | 2.49 |
| Class | | | % of total oil by total peak area | | | | |
| Monoterpene hydrocarbons | | | 48.80 | 49.48 | 49.16 | 52.68 | 50.66 |

| | | | | | |
|---------------------------------------|--------------|--------------|--------------|--------------|--------------|
| Oxygenated monoterpenes | 1.10 | 1.16 | 1.18 | 1.08 | 1.21 |
| Total monoterpenes | 49.92 | 50.64 | 50.34 | 53.76 | 51.87 |
| Monocyclic sesquiterpene hydrocarbons | 8.80 | 9.20 | 9.41 | 8.57 | 9.66 |
| Bicyclic sesquiterpene hydrocarbons | 5.03 | 4.89 | 4.98 | 4.55 | 5.13 |
| Tricyclic oxygenated sesquiterpenes | 30.83 | 31.71 | 32.33 | 29.09 | 29.79 |
| Oxygenated bicyclic sesquiterpenes | 2.27 | 2.376 | 2.42 | 2.21 | 2.49 |
| Total sesquiterpenes | 46.95 | 48.18 | 49.14 | 44.42 | 47.08 |

Abbreviations of population: Bachkovo, Rodopi, without galbuli – BR1; Bachkovo, Rodopi with galbuli – BR2; IG Krichim, Rodopi with galbuli – IG1; Izgoryaloto Gyune, Rodopi without galbuli – IG2; Kresna gorge with galbuli – KG1.

Supplemental Table 2. Average concentration of volatile constituents (% of total oil in dried biomass) of *Juniperus sabina* collected in Bulgaria and in Slovakia.

| Constituent number | Volatile constituents of <i>J. sabina</i> | RI | Zvolen, SK | BI1 | BI2 | KB |
|---|---|------|------------|-------|-------|-------|
| -- % of total oil by total peak area -- | | | | | | |
| 1 | 1-Hexanal | 809 | 0.22 | 0.23 | 0.24 | 0.23 |
| 2 | 2-Hexen-1-al | 860 | 0.03 | 0.03 | 0.03 | 0.03 |
| 3 | 3-Hexen-1-ol | 868 | 0.04 | 0.04 | 0.04 | 0.03 |
| 4 | α -Thujene | 931 | 1.45 | 1.47 | 1.57 | 1.51 |
| 5 | α -Pinene | 939 | 1.89 | 1.94 | 2.06 | 1.97 |
| 6 | Camphene | 953 | 0.07 | 0.07 | 0.08 | 0.07 |
| 7 | Sabinene | 969 | 24.45 | 28.22 | 16.68 | 30.98 |
| 8 | β -Pinene | 974 | 0.15 | 0.15 | 0.16 | 0.15 |
| 9 | β -Myrcene | 991 | 2.61 | 2.66 | 2.84 | 2.72 |
| 10 | α -Terpinene | 1018 | 0.32 | 0.33 | 0.35 | 0.34 |
| 11 | p-Cymene | 1025 | 1.79 | 1.83 | 1.95 | 1.88 |
| 12 | Limonene | 1031 | 1.93 | 1.96 | 2.09 | 2.00 |
| 13 | β -Ocimene | 1050 | 0.44 | 0.45 | 0.48 | 0.46 |
| 14 | γ -Terpinene | 1062 | 0.51 | 0.53 | 0.56 | 0.53 |
| 15 | <i>cis</i> -Sabinene hydrate | 1068 | 0.88 | 0.90 | 0.96 | 0.92 |
| 16 | α -Terpinolene | 1088 | 0.43 | 0.44 | 0.05 | 0.88 |
| 17 | β -Linalool | 1096 | 0.12 | 0.23 | 1.10 | 0.12 |
| 18 | <i>trans</i> Sabinene hydrate | 1098 | 0.64 | 0.65 | 0.70 | 0.67 |
| 19 | <i>cis</i> -Thujone | 1102 | 0.20 | 0.21 | 0.21 | 0.21 |
| 20 | <i>trans</i> -Thujone | 1114 | 0.11 | 0.12 | 0.12 | 0.12 |
| 21 | Terpinen-4-ol | 1177 | 9.25 | 12.41 | 10.66 | 13.63 |
| 22 | β -Citronellol | 1225 | 0.87 | 0.88 | 0.94 | 0.90 |
| 23 | Linalyl acetate | 1257 | 0.25 | 0.25 | 0.27 | 0.25 |
| 24 | (S)-(-)- Methyl citronellate | 1262 | 4.55 | 4.64 | 4.94 | 4.74 |
| 25 | Bornyl acetate | 1285 | 0.12 | 0.12 | 0.13 | 0.12 |
| 26 | Myrtenyl acetate | 1298 | 20.81 | 1.32 | 23.02 | 2.78 |
| 27 | δ -Elemene | 1338 | 0.32 | 0.32 | 0.34 | 0.33 |
| 28 | Methyl eugenol | 1357 | 0.06 | 13.49 | 0.06 | 0.06 |
| 29 | β -Elemene | 1390 | 0.29 | 0.29 | 0.31 | 0.30 |

| | | | | | | |
|---------------------------------------|------------------------|--|--------------|--------------|--------------|-------|
| 30 | β -Caryophyllene | 1419 | 0.11 | 0.10 | 0.16 | 0.27 |
| 31 | γ -Elemene | 1433 | 0.49 | 0.50 | 0.53 | 0.51 |
| 32 | α -Humulene | 1454 | 0.20 | 0.21 | 0.22 | 0.21 |
| 33 | γ -Muurolene | 1479 | 0.09 | 0.08 | 0.09 | 0.09 |
| 34 | Germacrene D | 1480 | 0.81 | 0.83 | 0.88 | 0.85 |
| 35 | α -Muurolene | 1500 | 0.27 | 0.27 | 0.29 | 0.28 |
| 36 | γ -Cadinene | 1513 | 0.64 | 0.65 | 0.70 | 0.67 |
| 37 | δ -Cadinene | 1524 | 1.63 | 1.67 | 1.77 | 1.70 |
| 38 | α -Cadinene | 1538 | 0.53 | 0.54 | 0.57 | 0.55 |
| 39 | Elemol | 1549 | 12.18 | 8.45 | 13.23 | 13.70 |
| 40 | Germacrene-D-4-ol | 1575 | 0.13 | 0.13 | 0.56 | 0.13 |
| 41 | Spathulenol | 1578 | 0.51 | 0.52 | 0.55 | 0.53 |
| 42 | γ -Eudesmol | 1632 | 0.68 | 0.69 | 0.73 | 0.70 |
| 43 | β -Eudesmol | 1651 | 0.54 | 0.56 | 0.59 | 0.56 |
| 44 | α -Cadinol | 1641 | 3.47 | 3.54 | 3.77 | 3.62 |
| 45 | α -Eudesmol | 1654 | 0.61 | 0.62 | 0.66 | 0.63 |
| 46 | Sclarene | 1974 | 0.38 | 1.38 | 0.41 | 1.24 |
| Class | | % of total oil by total peak area | | | | |
| Oxygenated aliphatic | | 0.29 | 0.29 | 0.31 | 0.30 | |
| Monoterpene hydrocarbons | | 34.26 | 38.00 | 26.92 | 41.50 | |
| Oxygenated monoterpenes | | 31.72 | 15.55 | 36.50 | 18.15 | |
| Other monoterpenes | | 7.23 | 7.70 | 7.21 | 8.20 | |
| Total monoterpenes | | 73.20 | 61.26 | 70.63 | 67.94 | |
| Monocyclic sesquiterpene hydrocarbons | | 14.22 | 10.52 | 15.88 | 15.81 | |
| Bicyclic sesquiterpene hydrocarbons | | 3.46 | 3.53 | 3.76 | 3.78 | |
| Oxygenated bicyclic sesquiterpenes | | 5.29 | 5.40 | 5.75 | 5.51 | |
| Other sesquiterpenes | | 0.51 | 0.52 | 0.55 | 0.52 | |
| Total sesquiterpenes | | 23.48 | 19.97 | 25.96 | 25.63 | |
| Phenylpropanoid compound | | 0.06 | 13.50 | 0.07 | 0.07 | |

Abbreviations of populations: Zvolen, Slovakia, M – CK; Beli Iskar, M – BI1; Beli Iskar, F – BI2; Krushovska bara, Stara planina, M – KB.