**Table 1.** Mean metabolite concentrations ± standard error (n=3) measured by High Performance Liquid Chromatography (HPLC) for 13 *Scutellaria* species. Tissue samples were prepared from fresh leaf, stem, or root tissues of mature plants. Units are µmol/g fresh weight.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Species | Organ | Apigenin | Apigenin 7-G | Scutellarein | Scutellarin | Hispidulin | Hispiduloside | Chrysin | Chrysin 7-G |
| *S. insignis* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.55 ± 0.07 | 2.35 ± 0.86 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. insignis* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.12 ± 0.04 | 0.43 ± 0.12 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. insignis* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. indica var. coccinea* | Leaves | 1.64 ± 0.80 | 2.58 ± 0.98 | 1.59 ± 1.07 | 11.75 ± 4.97 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. indica var. coccinea* | Stems | 0.74 ± 0.12 | 1.81 ± 0.20 | 0.30 ± 0.10 | 5.17 ± 0.31 | 0.02 ± 0.01 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. indica var. coccinea* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.37 ± 0.06 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.04 ± 0.03 |
| *S. barbata* | Leaves | 0.00 ± 0.00 | 0.01 ± 0.01 | 4.59 ± 0.33 | 1.51 ± 0.70 | 0.10 ± 0.02 | 0.00 ± 0.00 | 0.03 ± 0.00 | 0.00 ± 0.00 |
| *S. barbata* | Stems | 0.00 ± 0.00 | 0.11 ± 0.02 | 1.90 ± 0.23 | 1.13 ± 0.25 | 0.09 ± 0.01 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. barbata* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. racemosa* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.20 ± 0.35 | 0.63 ± 0.18 | 0.00 ± 0.00 | 0.12 ± 0.01 | 0.00 ± 0.00 |
| *S. racemosa* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.94 ± 0.33 | 0.25 ± 0.06 | 0.06 ± 0.06 | 0.03 ± 0.03 | 0.00 ± 0.00 |
| *S. racemosa* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. strigillosa* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 4.31 ± 1.15 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.38 ± 0.19 |
| *S. strigillosa* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.69 ± 0.06 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.14 ± 0.07 |
| *S. strigillosa* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.65 ± 0.21 | 0.56 ± 0.21 |
| *S. dependens* | Leaves | 4.72 ± 2.36 | 11.53 ± 2.94 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.24 ± 0.14 |
| *S. dependens* | Stems | 0.00 ± 0.00 | 2.13 ± 0.34 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.04 ± 0.04 | 0.43 ± 0.05 |
| *S. dependens* | Roots | 0.00 ± 0.00 | 0.02 ± 0.02 | 0.00 ± 0.00 | 0.20 ± 0.20 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.16 ± 0.09 | 0.69 ± 0.12 |
| *S. wrightii* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.13 ± 0.09 | 0.02 ± 0.00 | 0.00 ± 0.00 | 0.82 ± 0.17 | 0.13 ± 0.09 |
| *S. wrightii* | Stems | 0.00 ± 0.00 | 0.03 ± 0.01 | 0.00 ± 0.00 | 2.10 ± 0.25 | 0.63 ± 0.08 | 0.00 ± 0.00 | 0.99 ± 0.37 | 2.23 ± 0.11 |
| *S. wrightii* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. suffrutescens* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.44 ± 0.15 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.04 ± 0.04 |
| *S. suffrutescens* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.26 ± 0.33 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. suffrutescens* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.12 ± 0.02 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. baicalensis* | Leaves | 0.19 ± 0.03 | 0.13 ± 0.01 | 0.27 ± 0.14 | 0.10 ± 0.10 | 0.00 ± 0.00 | 0.00 ± 0.00 | 4.84 ± 0.53 | 1.45 ± 0.24 |
| *S. baicalensis* | Stems | 0.12 ± 0.12 | 0.22 ± 0.01 | 1.04 ± 0.43 | 1.76 ± 0.28 | 0.03 ± 0.02 | 0.00 ± 0.00 | 0.18 ± 0.04 | 0.09 ± 0.01 |
| *S. baicalensis* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.30 ± 0.01 |
| *S. tournefortii* | Leaves | 0.00 ± 0.00 | 0.28 ± 0.07 | 0.00 ± 0.00 | 2.98 ± 0.65 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.49 ± 0.02 | 4.69 ± 0.97 |
| *S. tournefortii* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.47 ± 0.46 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.01 ± 0.01 | 0.15 ± 0.04 |
| *S. tournefortii* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.08 ± 0.04 |
| *S. altissima* | Leaves | 0.00 ± 0.00 | 0.28 ± 0.15 | 0.65 ± 0.28 | 4.17 ± 1.22 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.75 ± 0.07 | 2.62 ± 0.18 |
| *S. altissima* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.11 ± 0.13 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.04 ± 0.02 | 0.35 ± 0.05 |
| *S. altissima* | Roots | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. leonardii* | Leaves | 0.11 ± 0.01 | 0.00 ± 0.00 | 0.22 ± 0.04 | 0.00 ± 0.00 | 0.13 ± 0.01 | 0.00 ± 0.00 | 25.34 ± 0.72 | 0.79 ± 0.09 |
| *S. leonardii* | Stems | 0.02 ± 0.02 | 0.00 ± 0.00 | 0.11 ± 0.01 | 0.16 ± 0.08 | 0.07 ± 0.00 | 0.00 ± 0.00 | 5.37 ± 0.41 | 0.91 ± 0.31 |
| *S. leonardii* | Roots | 0.06 ± 0.03 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.82 ± 0.19 | 0.10 ± 0.03 | 0.00 ± 0.00 | 0.40 ± 0.08 | 0.18 ± 0.04 |
| *S. pekinensis var. alpina* | Leaves | 0.12 ± 0.03 | 0.43 ± 0.01 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 9.95 ± 1.45 | 16.87 ± 2.39 |
| *S. pekinensis var. alpina* | Stems | 0.13 ± 0.13 | 0.32 ± 0.05 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 3.78 ± 0.47 | 8.09 ± 0.77 |
| *S. pekinensis var. alpina* | Roots | 0.00 ± 0.00 | 0.19 ± 0.10 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 4.96 ± 0.59 |

**Table 1 cont.** Mean metabolite concentrations ± standard error (n=3) measured by High Performance Liquid Chromatography (HPLC) for 13 *Scutellaria* species. Tissue samples were prepared from fresh leaf, stem, or root tissues of mature plants. Units are µmol/g fresh weight.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Species | Organ | Baicalein | Baicalin | Oroxylin A | Oroxyloside | Wogonin | Wogonoside | Acteoside |
| *S. insignis* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. insignis* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.08 ± 0.08 | 0.00 ± 0.00 |
| *S. insignis* | Roots | 0.00 ± 0.00 | 0.03 ± 0.03 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.46 ± 0.10 | 1.26 ± 0.31 | 0.00 ± 0.00 |
| *S. indica var. coccinea* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.54 ± 0.21 |
| *S. indica var. coccinea* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.11 ± 0.05 | 0.01 ± 0.02 | 0.00 ± 0.00 |
| *S. indica var. coccinea* | Roots | 0.00 ± 0.00 | 1.39 ± 0.10 | 0.06 ± 0.00 | 0.00 ± 0.00 | 3.76 ± 0.37 | 4.81 ± 0.40 | 0.42 ± 0.18 |
| *S. barbata* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. barbata* | Stems | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.03 ± 0.02 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. barbata* | Roots | 1.49 ± 0.04 | 2.59 ± 0.49 | 0.08 ± 0.01 | 0.34 ± 0.18 | 3.88 ± 0.34 | 1.77 ± 0.30 | 0.52 ± 0.08 |
| *S. racemosa* | Leaves | 0.34 ± 0.29 | 7.59 ± 1.95 | 14.39 ± 2.58 | 29.39 ± 8.00 | 0.02 ± 0.02 | 0.00 ± 0.00 | 1.64 ± 1.64 |
| *S. racemosa* | Stems | 0.24 ± 0.22 | 6.36 ± 2.13 | 5.09 ± 1.09 | 15.17 ± 4.14 | 0.44 ± 0.03 | 0.45 ± 0.19 | 1.40 ± 1.40 |
| *S. racemosa* | Roots | 0.08 ± 0.02 | 6.98 ± 1.20 | 0.44 ± 0.11 | 2.02 ± 0.38 | 1.82 ± 0.06 | 1.60 ± 0.25 | 0.87 ± 0.40 |
| *S. strigillosa* | Leaves | 3.37 ± 1.17 | 36.97 ± 6.14 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.06 ± 0.04 | 0.27 ± 0.03 | 0.21 ± 0.21 |
| *S. strigillosa* | Stems | 0.36 ± 0.06 | 4.41 ± 0.63 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.64 ± 0.12 | 0.68 ± 0.11 | 0.00 ± 0.00 |
| *S. strigillosa* | Roots | 0.13 ± 0.03 | 3.81 ± 1.09 | 0.13 ± 0.03 | 1.56 ± 0.77 | 1.27 ± 0.40 | 2.37 ± 0.58 | 0.17 ± 0.17 |
| *S. dependens* | Leaves | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 6.25 ± 2.12 | 11.91 ± 2.03 | 0.00 ± 0.00 |
| *S. dependens* | Stems | 0.00 ± 0.00 | 0.66 ± 0.16 | 0.00 ± 0.00 | 0.00 ± 0.00 | 1.00 ± 0.09 | 6.90 ± 1.12 | 0.00 ± 0.00 |
| *S. dependens* | Roots | 0.26 ± 0.03 | 7.45 ± 1.06 | 0.96 ± 0.24 | 5.46 ± 1.22 | 3.05 ± 0.36 | 4.53 ± 0.73 | 1.55 ± 0.27 |
| *S. wrightii* | Leaves | 0.78 ± 0.18 | 1.21 ± 0.63 | 0.10 ± 0.02 | 0.16 ± 0.05 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. wrightii* | Stems | 3.10 ± 1.31 | 29.90 ± 0.92 | 2.24 ± 0.43 | 14.87 ± 0.26 | 0.62 ± 0.07 | 0.40 ± 0.11 | 0.00 ± 0.00 |
| *S. wrightii* | Roots | 18.10 ± 1.37 | 43.99 ± 9.53 | 1.17 ± 0.38 | 4.22 ± 1.17 | 3.13 ± 0.53 | 3.09 ± 0.87 | 0.00 ± 0.00 |
| *S. suffrutescens* | Leaves | 1.76 ± 0.15 | 47.43 ± 9.38 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. suffrutescens* | Stems | 1.75 ± 0.09 | 36.72 ± 0.68 | 0.00 ± 0.00 | 2.37 ± 0.25 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. suffrutescens* | Roots | 6.55 ± 0.93 | 54.56 ± 8.68 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. baicalensis* | Leaves | 0.19 ± 0.08 | 0.20 ± 0.11 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. baicalensis* | Stems | 0.06 ± 0.03 | 0.87 ± 0.87 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.11 ± 0.11 | 0.02 ± 0.02 | 0.01 ± 0.01 |
| *S. baicalensis* | Roots | 0.20 ± 0.03 | 32.81 ± 2.22 | 0.23 ± 0.13 | 0.87 ± 0.87 | 3.49 ± 0.18 | 6.43 ± 0.43 | 0.00 ± 0.00 |
| *S. tournefortii* | Leaves | 0.53 ± 0.13 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.06 ± 0.06 | 0.00 ± 0.00 |
| *S. tournefortii* | Stems | 0.28 ± 0.07 | 0.08 ± 0.04 | 0.00 ± 0.00 | 0.06 ± 0.03 | 0.13 ± 0.05 | 2.43 ± 0.66 | 0.00 ± 0.00 |
| *S. tournefortii* | Roots | 0.13 ± 0.06 | 0.93 ± 0.08 | 0.08 ± 0.01 | 1.24 ± 0.14 | 2.33 ± 0.20 | 7.61 ± 0.15 | 0.00 ± 0.00 |
| *S. altissima* | Leaves | 0.70 ± 0.18 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. altissima* | Stems | 0.15 ± 0.05 | 0.47 ± 0.38 | 0.00 ± 0.00 | 0.06 ± 0.06 | 0.34 ± 0.26 | 1.26 ± 0.51 | 0.00 ± 0.00 |
| *S. altissima* | Roots | 0.07 ± 0.00 | 5.07 ± 0.66 | 0.14 ± 0.02 | 0.64 ± 0.07 | 2.90 ± 0.21 | 2.30 ± 0.26 | 0.00 ± 0.00 |
| *S. leonardii* | Leaves | 0.22 ± 0.03 | 0.07 ± 0.03 | 0.59 ± 0.11 | 0.00 ± 0.00 | 0.07 ± 0.07 | 0.06 ± 0.02 | 0.15 ± 0.15 |
| *S. leonardii* | Stems | 0.34 ± 0.14 | 0.17 ± 0.08 | 0.37 ± 0.03 | 0.03 ± 0.03 | 1.24 ± 0.09 | 0.10 ± 0.05 | 0.00 ± 0.00 |
| *S. leonardii* | Roots | 0.12 ± 0.03 | 5.35 ± 0.94 | 1.86 ± 0.31 | 2.18 ± 0.33 | 5.62 ± 1.10 | 0.00 ± 0.00 | 0.38 ± 0.38 |
| *S. pekinensis var. alpina* | Leaves | 0.13 ± 0.01 | 0.23 ± 0.01 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 |
| *S. pekinensis var. alpina* | Stems | 0.09 ± 0.05 | 0.37 ± 0.10 | 0.03 ± 0.03 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.00 ± 0.00 | 0.24 ± 0.12 |
| *S. pekinensis var. alpina* | Roots | 0.58 ± 0.13 | 4.24 ± 0.48 | 0.61 ± 0.15 | 0.27 ± 0.14 | 0.00 ± 0.00 | 0.02 ± 0.02 | 1.08 ± 0.08 |