**Title:** An investigation of phytochemical diversity in *Scutellaria* to identify … health effects

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The *Scutellaria* genus contains over 350 species of plants, many which produce phytochemicals having a significant effect on human health. Due to its use in traditional Chinese medicine, *Scutellaria baicalensis* has been extensively studied, and its root extracts are proven to contain phytochemicals with anti-cancer, anti-Alzheimer’s, and anxiolytic properties. Although phytochemical profiles for *S. baicalensis*, and several other *Scutellaria* species have been well characterized, little is known about the hundreds of other *Scutellaria* species. This study aims to extend the current knowledge of phytochemical accumulation in *Scutellaria* by analyzing a large set of species representative of the diversity in the genus. Targeted chemical analysis of leaf, shoot, and root extracts was completed with High Performance Liquid Chromatography (HPLC) to quantify 15 phytochemicals with human health effects. By comparing chemical analysis results to a phylogenetic tree of *Scutellaria* constructed using chloroplast DNA, clades containing species with similar phytochemical profiles were identified. Chemical analysis results were also compared to a previously published phytochemical pathway for *S. baicalensis*. Inconsistences in site of accumulation between the published pathway and chemical analysis results for multiple species indicate that significant differences in phytochemical pathway gene expression exist between different species. Researchers studying *Scutellaria* can use the results of this work to identify previously uncharacterized species with medicinal potential for further study. A better understanding of phytochemical diversity in *Scutellaria* will aid in the development of new drugs and treatments from the extracts of the plant.

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