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## **Quantifying medicinal compounds in various elderberry tissues in response to genotype and environment**

The American elderberry (*Sambucus nigra* L. subsp. *canadensis* R. Bolli) is an attractive shrub native to central and eastern North America that produces edible flowers and berries. In Europe, tea made from flowers of the subspecies *nigra* is a popular herbal treatment for respiratory infections such as colds and influenza. Potential active compounds in elderberry include phenolics such as quercetin, rutin, and chlorogenic acid. Very little is known about genetic, environmental, and seasonal influences on the concentration of such metabolites in the non-fruit tissues of elderberry, especially in the North American subspecies *canadensis*. The objective of this study, therefore, was to quantify the production of medicinal compounds in various elderberry tissues in response to genotype, environment, and season. In 2003, an experiment was established at Mt. Vernon and Mountain Grove, MO, and Corvallis, OR to evaluate the performance of 10 new elderberry selections compared with two older standard cultivars. The experiment was set up in a completely randomized design, with four replicated plots of the same 12 cultivars per site. A variety of horticultural and phenological data are being collected from these plantings over multiple growing seasons. During 2005, tissue samples were collected from each site in early June (at peak anthesis) and early August (at initiation of fruit ripening). Representative samples of woody stem, green stem, leaf, and flower were collected from all plots at each site. Samples were frozen, freeze-dried, ground, extracted, and analyzed by HPLC for chlorogenic acid, rutin and quercetin. Preliminary results revealed mean chlorogenic acid levels of 1,063 mg kg<sup>-1</sup> in both green and woody stem, 4,021 mg kg<sup>-1</sup> in leaf, and 3,786 mg kg<sup>-1</sup> in flower. For rutin, woody stem had very low levels, green stem 283 mg kg<sup>-1</sup>, leaf 6,538 mg kg<sup>-1</sup>, and flower 13,005 mg kg<sup>-1</sup>. Quercetin levels and differences due to cultivar, environment, or season are being determined.