

Stevia rebaudiana (Bertoni) is a plant from the Asteraceae family with significant economic value because of the steviol glycoside sweeteners in its leaves. Chlorogenic acids and flavonoid glycosides of *S. rebaudiana* from seven different botanical varieties cultivated over two years and harvested three times a year in eight European locations were profiled and quantified in a total of 166 samples. Compounds quantified include chlorogenic acids as well as flavonoid glycosides and aglycons. All phenolic concentration profiles show a perfect Gaussian distribution. Principal component analyses allow distinction between varieties of different geographical origin and distinction between different plant varieties. Although concentrations of all chlorogenic acids showed a positive correlation, no correlation was observed for flavonoid glycosides. Conclusions from these findings with respect to the biosynthesis and functional role of phenolics in *S. rebaudiana* are discussed.

Authors: Karaköse H, Müller A, Kuhnert N

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