

Correlation between Structure and Taste in Steviol Glycosides: Some Preliminary Results

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ABSTRACT

Objective: Nowadays the application of steviol glycosides in different food products is increasing. However, one of the remaining problems is the bitter aftertaste that is present in quite some samples. In this study, we tried to correlate the results of the analysis with the sweetness or bitterness of the sample. The ultimate goal was trying to identify at least some compounds that might be responsible for the bitter aftertaste.

Materials and Methods: Some 32 samples of steviol glycosides were obtained from diverse commercial sources. The steviol glycosides were dissolved in potable water at a concentration of 50 mg per 100 mL. The samples were tasted by an untrained tasting panel of 5 people and a trained panel of 7 people. The samples were randomly tasted 2 by 2 by each participant, and the most bitter and most sweet of the two was set aside for the next round. A sample received 1; 3; 6; 10 or 15 points for sweetness / bitterness according to the highest round it reached. Adding up all the points from all samples from both panels allowed to arrange the samples according to bitterness and sweetness. The results of both panels correlated well with each other.

All samples were analyzed with HPLC, with a method inspired to the one described elsewhere (Jooken et al., 2012). The column used for these experiments was a C18 Kinetex column (150 x 4.6 mm ; 2.6 μ m), which gave a superior resolution, compared to the published method. The mobile phase was composed from 25 mmol.L⁻¹ H₃PO₄ (solvent A) and acetonitrile (solvent B). The gradient was as follows: 0 min: 30 % B ; 2 min: 30 % B ; 6 min: 40% B ; 10 min: 48% B ; 14 min: 82% B.

Conclusion and Broader Impacts: The analysis of the most sweet and most bitter samples clearly reveals that in the more bitter samples always stevioside and its hydrolysis products (Rubusoside, Steviol Bioside, sometimes steviol) were found, see Figure 1. These compounds are always absent in the most sweet tasting samples.

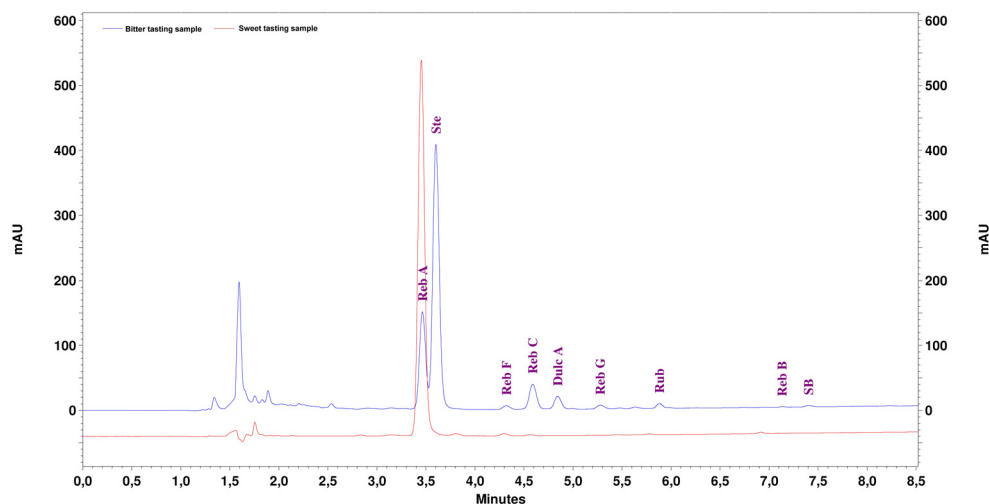


Figure 1: Chromatograms of sweet and bitter tasting samples

We can conclude that stevioside, and / or its hydrolysis products contribute significantly to the bitter aftertaste in samples of steviol glycosides, dissolved in water.

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LITERATURE CITED

Jooken, E., Amery, R., Struyf, T., Duquenne, B., Geuns, J., & Meesschaert, B. (2012). Stability of Steviol Glycosides in Several Food Matrices. [Article]. *Journal of Agricultural and Food Chemistry*, 60(42), 10606-10612.