

1 **Using transglycosidation to improve the bitterness of steviol glycosides**

2 Hsiu Yu, Ho (5110)

3 2022/04/13

4 **Outline**

5 1. Introduction

6 2. Steviol glycosides sensory analysis

7 • Sweetness

8 • bitterness

9 3. Chemical constitution and taste mechanism of Steviol glycosides

10 4. Microbial enzymes improve the bitter taste of steviol glycosides

11 5. Conclusion

12 **Abstract**

13 Steviol glycosides (SGs) are a very common natural sweetener on the market, and  
14 the important sources of sweet compounds are stevioside (ST) and rebaudioside A (Reb  
15 A). SGs are 250-350 times sweeter than sucrose and have the advantage of low-calorie  
16 energy. They are often used by health-conscious consumers, but they are often criticized  
17 because of their bitter and licorice flavors, which limit their use by consumers. In order  
18 to overcome this disadvantage, the literature discussed in this seminar uses enzymes of  
19 microorganisms to elongate with the glucose residues of C-13 and/or C-19, so that the  
20 bitter taste can be improved. When cyclodextrin glucosyltransferase (CGTase) of  
21 *Geobacillus* sp. was used, ST and Reb A elongated 11 glucose residues, SGs significantly  
22 reduced bitterness and metallic taste, while Reb A significantly reduced sweetness;  
23 Dextranucrase of *Leuconostoc kimchii*, a glucose residue was elongated on C-13 or C-  
24 19 of ST, and its bitterness was also significantly reduced. The above results show that  
25 the main compound that imparts bitterness in SGs is ST, and the modification can  
26 significantly reduce the bitterness of SGs, which proves that the use of microbial enzymes  
27 to improve bitterness is effective.

## Reference

- 1  
2  
3 Kang, H.-J., Lee, H.-N., Hong, S.-J., Park, B.-R., Ameer, K., Cho, J.-Y., Kim, Y.-M.  
4 (2022). Synthesis and characteristics of a rebaudioside-A like compound as a  
5 potential non-caloric natural sweetener by *Leuconostoc kimchii* dextransucrase.  
6 *Food Chemistry*, 366, 130623.
- 7 Muñoz-Labrador, A., Azcarate, S., Lebrón-Aguilar, R., Quintanilla-López, J. E.,  
8 Galindo-Iranzo, P., Kolida, S., Methven, L., Rastall, R. A., Moreno, F. J.,  
9 Hernandez-Hernandez, O. (2020). Transglycosylation of Steviol Glycosides and  
10 Rebaudioside A: Synthesis Optimization, Structural Analysis and Sensory Profiles.  
11 *Foods*, 9(12), 1753.
- 12 Tian, X., Zhong, F., Xia, Y. (2022). Dynamic characteristics of sweetness and bitterness  
13 and their correlation with chemical structures for six steviol glycosides. *Food*  
14 *Research International*, 151, 110848.