PC-002

Analysis of Volatile Compounds of Flour and Porridge According to Different Types of Rice Flour using Electronic Nose

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[Introduction]

Electronic (e)-nose analysis is an easier and quicker method for predicting the difference degree between samples because it can detect small changes in sample components. In this study, the changes in the volatile components of different types of rice flour were investigated by comparing the aromatic compounds of nonglutinous, floury, and soft rice types with e-nose analyses.

[Materials and Methods]

The rice used in the experiment was harvested by Gyeongsangbuk-do Agricultural Research and Extension Services in 2019 and comprised the rice types Ilpum (nonglutinous rice), Garumi 2 (floury rice), and soft rice (Seolgaeng, Hangaru, and Shingil). The e-nose analysis was conducted as follows: 1.5 g rice flour was poured into a 10 mL vial, heated to 60 °C, and incubated at 500 rpm for 2 min. To measure the aromatic compound ratio, the sample was passed through the sensor. Subsequently, 1.5 g rice flour and water (ratio 1:1, v/v) were gelatinized at 95 °C for 15 min in a water tank and cooled to 40 °C for the porridge analysis. The gelatinized sample was heated to 60 °C, incubated at 500 rpm for 2 min, and quantified with the previously mentioned method. In addition, a principal component analysis (PCA) and discriminant function analysis (DFA) were performed, and the distance between the groups was measured. The e-nose used in the analysis was the α-FoX sensory system 3000.

[Results and Discussion]

According to the e-nose analysis results of the aromatic patterns of the flour and porridge using the selected five rice varieties, the PCA1 contribution rate was 95% to 98%. Therefore, the aromatic compounds were discriminated according to the different types of rice flour. Ilpum (nonglutinous rice) and Garumi 2 (floury rice) exhibited similar patterns, and the discriminant function second score (DF2) showed a positive position. By contrast, the DF2 of the soft rice (Seolgaeng, Hangaru, and Shingil) showed a negative position. Furthermore, Ilpum and Garumi 2, which were farther away than Seolgaeng, Hangaru, and Shingil based on the control results, had large numbers of aromatic compounds. This study demonstrates that floury rice exhibits different aromatic patterns than soft rice.

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