Utilization of multivariate statistics in evaluating mango processing quality

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Abstract

Mango processing quality is determined by mango raw materials quality. Quality characteristics of different mango varieties provide significant differences. Around 10 quality indices, including edible rate, total soluble solids, pH, titratable acid, total sugars, etc. of 16 mango varieties, were analyzed by multivariate statistics methods of factor analysis, principal component analysis (PCA) and systematic cluster analysis. Results indicated that the cumulative contributions of total variance of the first 5 principal components reached 85.86%. Among them, the first principal compo¬nent included pH and titratable acid, the second included color and fiber, the third included storability and taste, the fourth included total sugar and total soluble solids, the fifth included edible rate and aroma. That also reflected it was reasonable to evaluate mango processing quality by the 5 principal components. The result of factor scores indicated the processing quality of 'Tainong-1', 'Xiangmang' and 'Machesu' were excellent. Through systematic cluster analysis, 16 mango varieties were divided into 6 groups. 'Machesu' and 'Guire-284' were classified as group-1 and group-2 respectively, 'Sri Lanka' and 'Zihua' were classified into group-3, 'Tainong-1', 'Guire-10' and 'Guire-82' were classified into group-4, 'Ivory-22', 'Xiangmang', etc., were classified into group-5, 'Hongjinhuang', 'Qingpi', etc. were classified into group-6. Most varieties in group-2 and group-4 were considered as suitable for processing. The results showed different mango varieties having similar quality characteristics clustered in the same group.