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Evaluating taste-related attributes of black tea by micro-NIRS

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Title

Evaluating taste-related attributes of black tea by micro-NIRS

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Abstract

Tea taste assessments generally rely on panel sensory evaluation, which often yield inconsistent results. Therefore, the rapid and nondestructive assessment of the taste attributes of tea is important for its quality evaluation. This study assessed black tea taste attributes using a novel low-cost evaluation method that employed a smartphone-connected micro-near-infrared (micro-NIR) spectrometer. Bitterness and astringency intensity were evaluated by a trained panel, and caffeine and epigallocatechin gallate (EGCG) contents were analyzed using high-performance liquid chromatography. Partial least squares regression and multiple linear regression models were established on characteristic wavelengths selected using the successive projection algorithm and competitive adaptive reweighted sampling (CARS), respectively. The optimal prediction models obtained after conducting CARS selection yielded satisfactory results, with residual predictive deviation of 3.07, 2.28, 3.29, and 2.91 for bitterness score, astringency score, caffeine, and EGCG content, respectively. The results proved that micro-NIR spectrometers can be used to predict the taste attributes of black tea, providing a new method for the quality assessment black tea.

