Evaluation of NIRS as non-destructive test to evaluate quality traits of purple passion fruit

Phonkrit Maniwara, Kazuhiro Nakano, Shintaroh Ohashi, Danai Boonyakiat, Pimjai Seehanam, Parichat Theanjumpol and Pichaya Poonlarp

Abstract

Quality evaluation of passion fruit is an important practice before consuming or processing. The fruit's total soluble solids (TSS), titratable acidity (TA), and pulp content (PC) were predicted by near-infrared (NIR) spectroscopy. Prediction models were constructed by chemometrics of the partial least squares (PLS) regression on the NIR spectra from interactance spectroscopy. Accurate prediction results were obtained and showed high correlations (r) between the predicted and reference values (0.84, 0.91, and 0.99 for TSS, TA and PC, respectively). Small standard errors of prediction (SEPs) and bias were also found. A robust prediction model of pulp content provided the greatest value of the residual predictive deviation (RPD = 6.4). Variable selection effectively highlighted the important wavelengths and helped to prune the unimportant variables for the TSS, TA and PC produced calibrations with satisfactory results in the predictions (r = 0.84 – 0.98). In conclusion, nondestructive NIR spectroscopy can be a potential predictor for determining purple passion fruit quality.