

Sirinad Noypitak 2009: Non-Destructive Technique for Detection of Translucency in Mangosteen by Near Infrared Spectroscopy in Reflectance Mode. Master of Engineering (Agricultural Engineering), Major Field: Agricultural Engineering, Department of Agricultural Engineering. Thesis Advisor: Assistant Professor Siwalak Pathaveerat, Ph.D. 151 pages.

This study was aimed to investigate a technique to separate translucent flesh mangosteen from normal flesh mangosteen by multivariate data analysis. In the study, 217 mangosteens were used. All mangosteens were measured for specific gravity, moisture content and spectrum using FQA-Near Infrared (NIR) GUN in range of 700-1100 nm in interactance mode at 4 points on equatorial line. The spectra were pretreated with First Derivative (1D) or Second Derivative (2D) or Multiplicative Scatter Correction (MSC) or Standard Normal Variate (SNV) prior to building discriminant model using discriminant analysis (DA). The pretreatment that gave the best model was selected.

Discriminant Analysis showed that when using full range of NIR spectrum of the first side, third side and fourth side as predicting parameters the MSC absorbance gave classification accuracy of 83.9%. Partial Least Square Discriminant Analysis (PLS-DA) was performed so that the spectra particularly at wavelengths associated with separation between normal and translucent mangosteens could be selected. In case of using NIR spectrum at PLS-DA suggested wavelengths, the absorbance at 708 and 880 nm gave classification accuracy of 83.9% at all sides. The 2D absorbance at 716, 752, 831, 910, 953, 989, 1022, 1038 and 1058 nm (averaged from 4 sides) and the specific gravity resulted in accuracy of discrimination of 84.8%

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Student's signature

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Thesis Advisor's signature