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Effect of Storage Temperature on Thermal Properties of Mango cv. Nam Dok Mai Si Thong

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Abstract

Mango fruit cv. “Nam Dok Mai Si thong” (*Mangifera indica* L.) harvested at fully mature-green stage were stored at 5, 13 and 25 ±2 °C. The specific heat and thermal conductivity of flesh mango during storage were determined by Differential Scanning Calorimeter (DSC) followed ASTM-E1952 —98 method. The result showed that the specific heat of mango flesh stored at 25 ±2 °C increased in the first 2 days of storage, and remained constant thereafter, whereas those of the ones stored at 13 °C and 5 °C were relatively constant during 25 days of storage ($p < 0.05$). Thermal conductivity of mango flesh, on the other hand decreased in 5 days when stored at 13 °C, and increased rapidly afterwards. Similar results were found in the fruit stored at 25 ±2 °C, however, the thermal conductivity of mango flesh stored at 5 °C increased in the first 5 days and remained relatively constant during 25 days of storage. The electrolyte leakage of mango flesh showed similar results with the thermal conductivity for whatever storage temperatures. Chilling injury became visible as pitting and discoloration after 5 and 20 days at 5 °C and 13 °C, respectively. The electrolyte leakage of mango flesh stored at 13 °C increased continuously but that of 5 °C was relatively constant. Since electrolyte leakage is one of the indicators used to determine chilling injury and ripening process, the increasing of electrolyte leakage as well as thermal conductivity in the case of 13 °C might be due to chilling injury incorporated with ripening process. It is possible that the thermal conductivity of the fruit could be related to chilling injury symptom and ripeness.

Keywords: Chilling injury, mango, specific heat, thermal conductivity, thermal properties