

Title Influence of harvest maturity on quality and shelf-life of litchi fruit (*Litchi chinensis* Sonn.) dedicated to Prof. Dr.-Ing. Karlheinz Gierschner on the occasion of his 80th birthday.

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Citation Postharvest Biology and Technology, Volume 57, Issue 3, September 2010, Pages 162-175

Keywords Cold chain; Fresh produce; Fruit quality; PCA; PLS; Sapindaceae

Abstract

The impact of picking maturity on eating quality and shelf-life of cold-stored litchi fruit was evaluated for the Thai cultivars 'Hong Huey' and 'Chacapat'. Pericarp colour at harvest was specified by a litchi maturity index (*LMI*) and subsequent pericarp browning by a postharvest litchi colour index (*PLCI*), both being application-oriented indices deduced from the CIELab colour space. Fruit lots harvested within 15–20 days were distinguished as to their physiological maturity at harvest by means of principal component analysis (*PCA*). Irrespective of cultivars, titratable acids (*TA*), *LMI*, and fruit size contributed most to the specification of harvest maturity among seven ripeness attributes. Fruit quality was evaluated throughout cold storage (5 °C, 21 or 30 days) based on 13 attributes representing aril, pericarp and fruit properties, including the contents of acids and ethanol, activities of browning enzymes, and respiration rates. Rapid loss of pericarp moisture and high enzyme activities, mainly of peroxidase, accompanied visually perceivable pericarp browning within 3–5 days irrespective of harvest maturity. Subsequently, shelf-life was chiefly limited by increasing ethanol contents. According to the overall quality differences detected by *PCA*, there was an impact of harvest time on fruit quality throughout. As revealed by partial least squares regression (*PLS*) for both key factors, quality of 'Hong Huey' and 'Chacapat' fruit was determined by picking maturity at 42% and 27% and storage time at 17% and 25%. Most important, pink to red-shelled 'Hong Huey' and pink-shelled 'Chacapat' fruit, as specified by *TA*, *LMI* and size ranges at harvest, provided optimum eating quality and were superior to green-red-shelled breaker fruit in long supply chains.