

# Regulation of browning and senescence of litchi fruit mediated by phenolics and energy status: A postharvest comparison on three different cultivars

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## Abstract

Pericarp browning is one of the most important factors limiting the shelf life of litchi fruit. The storage behavior of three cultivars of litchi with different shelf life were studied to comprehensively address the importance of phenolic content and energy status in delaying the development of browning in litchi fruit after harvest. Results revealed that slower changes of browning indices; higher content of EGC, EC, ECG, GCG, PA2, total phenols and anthocyanins; lower activities of ANT, LAC, PPO, POD and PAL were detected in 'Jingganghongnuo', as compared to that in 'Guiwei' and 'Nuomici'. The transcript abundant of oxidation-enzyme corresponding genes *LcANT*, *LcLAC*, *LcPPO*, *LcPOD* and *LcPAL* exhibited similar trends as changes of phenolics and enzyme activities in three cultivars. The energy status and the relative expression intensity of ATP metabolic-related genes *LcATPb*, *LcSnRK2*, *LcAAC1*, and *LcAOX1* differed among the three cultivars and maintained higher levels in 'Jingganghongnuo'. Accordingly, the development of pericarp browning was significantly related to the content of phenolics, especially ECG and EC, and to the changes in ATP of litchi fruit after harvest. The comparative study on variety of litchi cultivars evident that the phenolics, energy status as well as the transcript abundant of their corresponding genes are potential indicators to mark the browning change in litchi fruit.