

Title Enzymatic Browning of Postharvest Litchi: A Review
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Citation Program and Abstracts, 3rd International Symposium on Longan, Lychee and Other Fruit Trees in Sapindaceae Family, August 25-29, 2008, Fuzhou, China. 132 pages.
Keywords litchi; browning

Abstract

Litchi is a popular fruit for its bright red pericarp and the tasty aril, but its commercial value is reduced by pericarp browning during storage. Enzymatic browning has been known to be caused by the accumulation of brown pigments resulted from the oxidation of polyphenols, including anthocyanins. The oxidation process mainly involves three enzymes: anthocyanase, which can degrade anthocyanins into anthocyanidins, polyphenol oxidase and peroxidase which can oxidize anthocyanidins and other phenols directly or indirectly, forming into brown pigments. Enzymatic browning does not happen in fresh red pericarp because the enzymes and substrates are well separated in different organelles. However, the pericarp cells gradually lose their membrane integrity due to lipid peroxidation caused by free radicals accumulated during pericarp aging. The leaky membranes provide opportunities for the above-mentioned enzymes to mix with their substrates, causing pericarp browning. Although the physiological mechanism for enzymatic browning of pericarp is now well understood, little is known about the molecular mechanism of the browning process. Further study on the dynamics of pericarp browning, related enzyme activity, gene expression and gene structure will provide us with better understanding on the enzymatic browning of pericarp and tools for us to explore new ways to control the browning process.