Title Inhibition of pure oxygen on pericarp browning of harvested litchi fruit in association with energy level

Authors J.Y. Shi, X.G. Su, Y.B. Li, H.X. Qu, Y.M. Jiang, X.W. Duan

Citation ISHS Acta Horticulturae 804:339-346. 2008.

Keywords litchi; fruit; browning; membrane integrity; energy

Abstract

Pericarp browning is one of the major postharvest problems of litchi fruit, resulting in accelerated shelf life and reduced commercial value. Experiments were conducted to examine the effect of pure oxygen on pericarp browning of harvested litchi fruit in relation to energy metabolism. Exposure of litchi fruit to pure oxygen delayed the increase in membrane permeability and inhibited pericarp browning. However, application of dinotrophenol (DNP), a uncoupler of oxidative phosphorylation, prior to exposure to pure oxygen, accelerated loss of membrane integrity and occurrence of pericarp browning. Furthermore, exposure to pure oxygen enhanced respiration and cytochrome c oxidase activity, and maintained high levels of adenosine triphosphate (ATP) of litchi fruit during storage at 28°C. In addition, exogenous ATP treatment reduced the increase in relative leakage rate and delayed pericarp browning of litchi fruit while treatment with DNP exhibited the opposite effects on the relative leakage and pericarp browning. It was therefore suggested that energy production might be involved in maintenance of membrane integrity in association with inhibitory effect of pericarp browning of harvested litchi fruit caused by pure oxygen.