

Title Inhibition by nitric oxide of ethylene biosynthesis and lipoxygenase activity in peach fruit during storage

Author Shuhua Zhu, Mengchen Liu and Jie Zhou

Citation Postharvest Biology and Technology, Volume 42, Issue 1 , October 2006, Pages 41-48

Keywords ACC; ACC oxidase; Ethylene biosynthesis; Lipoxygenase; Nitric oxide; Peach fruit

Abstract

The effects of nitric oxide (NO) on ethylene biosynthesis and lipoxygenase (LOX) activity in a climacteric peach fruit (*Prunus persica* (L.) Batsch., cv. Feicheng) were studied. It was observed that, in peaches treated with 5 and 10 $\mu\text{l l}^{-1}$ NO, 1-aminocyclopropane-1-carboxylic acid (ACC) oxidase activity, ethylene production and LOX activity were reduced. This led to the accumulation of ACC and 1-malonyl aminocyclopropane-1-carboxylic acid (MACC) during storage. There was no evidence that ACC synthase activity was affected significantly by any concentration of NO. A plausible mechanism is proposed that NO is bound to ACC oxidase to form an ACC oxidase–NO complex, which is chelated by ACC to produce an ACC–ACC oxidase–NO complex, leading to a decrease in ethylene production. The increase in concentration of ACC in NO-treated peaches may result in the redirection of ethylene to MACC production. This is a secondary effect of NO.