

Title Effect of nitric oxide on disorder development and quality maintenance of plum fruit stored at low temperature

Authors D.D. Zhang, G.P. Cheng, J. Li, C. Yi, E. Yang, H.X. Qu, Y.M. Jiang, X.W. Duan

Citation ISHS Acta Horticulturae 804:549-554. 2008.

Keywords plum fruit; nitric oxide; browning; phenolic metabolism; softening; quality

Abstract

Experiments were conducted to investigate the effects of nitric oxide (NO) on disorder development and quality maintenance of harvested plum (*Prunus salicina* Lindl.) during storage at low temperature. Plum fruit were dipped for 3 min. in distilled water (control) or 1 mM sodium nitroprusside (SNP), a nitric oxide donor and then stored for 120 days at 2°C and 85-90% relative humidity. Firmness, pectin content, flesh browning, contents of total phenol and anthocyanins, activities of phenolic-associated enzymes, polyphenol oxidase (PPO), peroxidase (POD), phenylalanine ammonia lyase (PAL) and anthocyanase, and α,α -diphenyl- β -picrylhydrazyl (DPPH) radical scavenging activity, total soluble solids and titratable acidity were determined. NO treatment was effective in delaying fruit softening of plum throughout the storage period, which was associated with inhibition of pectin solubilisation/depolymerization. Application of NO also inhibited flesh browning development and delayed the increase in total phenolic content of plum fruit stored at 2°C, but had no inhibitory effect on PPO and POD activities. Moreover, the SNP-treated fruit showed slower flesh reddening and lower levels of anthocyanins, which was related to inhibition of PAL activity and activation of anthocyanase. In addition, treatment with NO resulted in higher titratable acidity content and lower DPPH radical scavenging activity of plum fruit, compared with the non-NO-treated fruit, but had no effect on the levels of total soluble solids. Overall, application of NO exhibited a potential for reducing chilling injury and extending storage life of plum fruit at low temperature.