

Nitric oxide modulates sugar metabolism and maintains the quality of red raspberry during storage

Keke Shi, Zunchun Liu, Junwen Wang, Shuhua Zhu and Dandan Huang

Scientia Horticulturae 256: 108611. (2019)

Abstract

The purpose of the study was to optimize the proper concentration of exogenous nitric oxide (NO), and its regulation on the fruit quality of red raspberry during cold storage. Red raspberry fruits were immersed in 5, 15, 30 $\mu\text{mol L}^{-1}$ NO and 200 $\mu\text{mol L}^{-1}$ cPTIO solution, respectively, for 2 min. The soluble solids contents (SSC), weight loss, respiratory rate, ethylene production, and the contents of anthocyanin, rutin, total phenolic, total flavonoid, $\text{O}_2^{\cdot-}$, $\cdot\text{OH}$ of red raspberry were measured. And the changes in sugar contents and the activities of enzymes associated with sugar metabolisms were investigated. The results showed that, compared with other concentrations, NO at 15 $\mu\text{mol L}^{-1}$ maintained high contents of anthocyanin, rutin, total phenol, and total flavonoids, and reduced the release of superoxide anion and hydroxyl radical; increased the enzymes activities of soluble sugars metabolism and regulated the composition of soluble sugars in red raspberries during storage. It could be concluded that exogenous NO at 15 $\mu\text{mol L}^{-1}$ was more suitable than other concentrations for maintaining the good quality of red raspberries during storage. NO at 15 $\mu\text{mol L}^{-1}$ could improve the antioxidant capacity and enhance the soluble sugar metabolism, and then maintain the storage quality of red raspberries.