

# Exogenous nitric oxide treatment impacts antioxidant response and alleviates chilling injuries in longkong pericarp

Karthikeyan Venkatachalam

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## Abstract

Nitric oxide (NO) is an important exogenous signaling molecule used to protect plants against abiotic stress-induced damages. Sodium nitroprusside (SNP) is a key exogenously applied NO donor to plants. Longkong fruit is susceptible to chilling injuries (CI) during prolonged low-temperature stress and causes the higher economic losses. The present study was aimed to control the CI and assess the ROS production and antioxidant responses in longkong pericarp by treating with SNP at various concentrations (0, 10, 20, 30 mM/L). The fruit was immersed in SNP solution for 20 min at room temperature and was then stored at 13 °C and at an 85% RH for 18 days. Chilling injury index, electrolytic leakage, MDA content,  $O_2\cdot^-$  and  $H_2O_2$  contents, and activities of the enzymes such as phenylalanine lyase (PAL), polyphenol oxidase (PPO), peroxidase (POD), superoxide dismutase (SOD), catalase (CAT) and ascorbate peroxidase (GPX) were measured at 3-day intervals. The results show that increasing the SNP concentration effectively increased the NO level and decreased the chilling injuries to longkong fruit pericarp. Treatment at 30 mM/L controlled the CI index, electrolytic leakage and regulated the production of MDA,  $O_2\cdot^-$  and  $H_2O_2$ . NO treated fruit pericarp had lower activities of browning related enzymes (PAL and PPO) and higher activities of antioxidant enzymes (POD, SOD, CAT, and GPX) than the control. The SNP treatment of longkong fruit could significantly control the chilling injuries and prolong the resistance against chilling stress.