

Title The physiological responses of carnation cut flowers to exogenous nitric oxide
Author Chang-li Zeng, Li Liu and Guo-quan Xu
Citation Scientia Horticulturae, Volume 127, Issue 3, 10 January 2011, Pages 424-430
Keywords Cut flowers; *Dianthus caryophyllus*; Nitric oxide; Physiological responses; Vase life

Abstract

Nitric oxide (NO) is a highly reactive signaling molecule and plays a variety of physiological roles in plants. The research on the application of NO to postharvest preservation of flowers and fruits shows great promise in recent years. However, the physiological mechanism of exogenous NO to affect cut flowers is not very clear. Therefore, an experiment was conducted to study the effect of exogenous NO on the vase life and physiological basis of *Dianthus caryophyllus* L. variety 'Monte'. In the present study, 0.1 mmol L⁻¹ sodium nitroprussiate (SNP) was used as the NO donor, and 5 μmol L⁻¹ methylene blue (MB-1) was used as its scavenger based on the preliminary experiment. We evaluated the physiological index including increase of stem weight, malondialdehyde (MDA) concentration and lipoxygenase (LOX) activity, and cell protection enzymes activities of superoxide dismutase (SOD), peroxidase (POD), catalase (CAT) and ascorbate peroxidase (APX). The results showed that exogenous NO could significantly extend the vase life of cut carnation flowers and markedly increase fresh mass. The balance of water metabolism and the activities of SOD, POD, CAT and APX also showed improvement, while the production of MDA content and LOX activity were obviously decreased. The results suggest that exogenous NO could delay petal wilting in carnation cut flowers, maintain water metabolism, the antioxidative enzymes activity and mass-eliminate reactive oxygen species (ROS) and as well as cell membrane stability. Moreover, the results indicated that MB-1 had the ability to reverse the active effects of NO on different physiological indexes. Therefore, the vase life of cut carnation flowers was markedly extended by SNP treatment.