Title	Regulation of ascorbate peroxidase at the transcript level is involved in tolerance to postharvest water deficit stress in the cut rose (*Rosa hybrida* L.) cv. Samantha
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Abstract

Cut rose (*Rosa hybrida*) cv. Samantha flowers were pretreated for 12 h with 6 mM ascorbic acid (AsA), 5 mM β-aminophenol, or water (control) prior to exposing to water deficit stress for 24 h, and then were placed into water for recovery and vase life. Vase life, flower development, water potential, malondialdehyde (MDA) content, superoxide dismutase (SOD), and ascorbate peroxidase (APX) activities were then determined until end of vase life. Water deficit stress reduced vase life and inhibited flower development. AsA pretreatment alleviated deterioration, while β-aminophenol pretreatment increased the deterioration. AsA pretreatment also decreased MDA content, and increased SOD and APX activities, but the opposite effects were found for the β-aminophenol pretreatment. A cDNA encoding cytosolic APX was isolated, and named *Rh-APX1*. Gene expression in control petals increased in the first 9 h, then decreased until the end of water deficit stress; it recovered when water was resupplied, and peaked again on the third day after placing flowers in water. Compared with the control, the gene expression was enhanced substantially by AsA pretreatment throughout water deficit stress, water recovery, and throughout vase life. In contrast, the expression was inhibited by β-aminophenol. The changing patterns of *Rh-APX1* gene expression paralleled those of APX activity. The results suggest that regulation of APX at the transcript level may be involved in the response to water deficit stress in the cut rose cv. Samantha.

Abbreviations: APX, ascorbate peroxidase; AsA, ascorbic acid; MDA, malondialdehyde; SOD, superoxide dismutase