

Title Drought stress and postproduction quality in petunia
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Abstract

The postproduction shelf life and garden performance of ornamental plants can be greatly reduced by drought-induced senescence. Water deficit increases abscisic acid (ABA) levels within the plant, and this ABA regulates drought stress signaling pathways and physiological responses. Exogenous applications of ABA can be used to decrease stomatal conductance and delay drought-induced wilting and senescence in many ornamental plants, but a better understanding of the gene changes that regulate senescence is required to further enhance drought tolerance. The *Asr* (ABA/ water and stress/ ripening induced) gene family members appear to function as transcriptional regulators of stress signaling. We have identified an *Asr*-like gene in the ornamental model plant, *Petunia x hybrida*. *PhASR4* was up regulated in petunia leaves during water deprivation. Transcript levels quickly returned to basal levels after wilted plants were rewatered. *PhASR4* transcripts were also detected at basal levels in 'Mitchell Diploid' (MD) corollas on the day of flower opening (anthesis) and increased at 6 days after anthesis when the flowers were just showing visual symptoms of senescence. *PhASR4* had 2-fold lower transcript abundance at anthesis in ethylene insensitive transgenic petunia corollas (*35S::etr1-1*). The increase in transcript abundance accompanying flower senescence in MD flowers was not detected in *etr1-1* flowers. *PhASR4*s regulation of developmental and stress-induced senescence and its putative role in enhancing the postproduction quality of ornamental plants will be discussed.