

Abstract

Daffodil (*Narcissus pseudonarcissus* L. 'Dutch Master') flowers senesced prematurely when exposed to $1 \mu\text{l l}^{-1}$ ethylene. The hormone caused watersoaking of the perianth, a symptom not seen in perianths of flowers held in air. Ethylene also enhanced the expression of senescence-associated transcripts in the daffodil tepals. The ethylene-enhanced transcript accumulation and the ethylene-accelerated senescence were prevented by pretreating the flowers with 500 nl l^{-1} 1-methylcyclopropene (1-MCP) for 6 h at 20 °C. Repeated 1-MCP treatments provided only a modest extension in longevity of attached flowers held in air and had no noticeable effect on the life of detached flowers held in water. The unpollinated flowers produced negligible amounts of ethylene ($<0.5 \text{ nl g}^{-1} \text{ FW h}^{-1}$) throughout their maturation and senescence. Following cross-pollination, the flowers produced up to $3.7 \text{ nl g}^{-1} \text{ FW h}^{-1}$ ethylene and the perianth senesced prematurely. The effect of pollination was prevented by pretreating the flowers with 1-MCP. The life of the flowers was extended when they were held in solutions containing $100 \mu\text{M}$ gibberellic acid (GA_3). GA_3 also delayed the senescence following pollination and exposure to ethylene, although the delay was much less than that resulting from the 1-MCP treatment.