

**Title** 24Floral fragrance and ethylene action  
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#### **Abstract**

*Petunia* (*Petunia* × *hybrida* ‘Mitchell Diploid’ [MD]) flowers synthesize and emit volatile benzenoids/phenylpropanoids from the corolla limb, beginning at anthesis and continuing until senescence. Seven genes involved in the production of floral volatile benzenoids/phenylpropanoids (FVBP) have been identified in MD. As a group these FVBP genes are transcribed at high levels in the corolla limb from anthesis until floral senescence in the MD flower. Therefore, FVBP gene expression is regulated as a concerted system at the organ specific and floral developmental levels. In *petunia*, the pollination event produces the phytohormone ethylene, which results in severely reduced FVBP emission and accelerated floral senescence. Taken together, it is not surprising that exogenous ethylene treatment reduces transcript levels of all the FVBP genes examined in MD flowers. However, short-term (2 h) ethylene treatments do not accelerate senescence in MD flowers and have little to no effect on FVBP emission 24 h after the start of treatments. This is in contrast to a long-term (10 h) ethylene treatment that results in accelerated senescence and markedly reduced FVBP emission 24 h after the start of treatments. These results depict floral volatile benzenoid/phenylpropanoid biosynthesis as a specific system with highly regulated transcription of the FVBP genes.