

Title *Kalanchoe blossfeldiana* plants expressing the *Arabidopsis etr1-1* allele show reduced ethylene sensitivity

Author Mohsen Sanikhani, Heiko Mibus, Bjarne M. Stummann and Margrethe Serek

Citation Plant Cell Reports, 27, Number 4, 729-737, 2008

Keywords *Agrobacterium tumefaciens*; *etr1-1* gene; Flower longevity; Flower-specific *fbp1*-promoter; *Kalanchoe blossfeldiana*; Plasmid pBEO210

Abstract

Transgenic *Kalanchoe blossfeldiana* Poelln. with reduced ethylene sensitivity in flowers was obtained by *Agrobacterium tumefaciens*-mediated transformation using the plasmid pBEO210 containing the mutant ethylene receptor gene *etr1-1* from *Arabidopsis thaliana* under the control of the flower-specific *fbp1*-promoter from *Petunia*. Three ethylene-resistant T0 lines, 300, 324 and 331, were selected and analyzed for postharvest-performance and morphological characteristics. Line 324 was found to be infertile and only slightly less ethylene-sensitive than control-plants, but lines 300 and 331 had significantly increased ethylene-resistance and were fertile. These two lines were analyzed for copy-number of the *etr1-1* gene by Southern blotting and were crossed with the ethylene-sensitive cultivar 'Celine' to create T1 progeny. Line 300 contains two T-DNA copies per nucleus, one of which is rearranged, and these are unlinked according to segregation data from the crossing to 'Celine' and PCR-analysis of progeny plants. For control plants all flowers were closed after 2 days at $2 \mu\text{l l}^{-1}$ ethylene, but for line 300 only 33% were closed after 10 days. Line 331 contains three T-DNA copies per nucleus and is more sensitive to ethylene than line 300. In the line 300 the *etr1-1* gene was found by RT-PCR to be expressed in petals and stamens but not in carpels and sepals. Both lines 300 and 331, and their progeny, appear morphologically and physiologically identical to control plants except for the higher ethylene resistance. Line 300 and its progeny with only one T-DNA copy have very low ethylene sensitivity and may be useful in future breeding.

<http://www.springerlink.com/content/ng05634414102822/fulltext.pdf>