Title	Comparison of different T-DNA structures of ACC oxidase on extending cut flower vase-life of carnation
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Abstract

The cultivar 'Master' of carnation (*Dianthus caryophyllus* L.) was transformed with four T-DNA structures containing sense, antisense, sense direct repeat, antisense direct repeat and inverted repeat genes of ACC oxidase mediated by *Agrobacterium tumefaciens*. Southern blotting detection showed that foreign gene was integrated into the carnation genome and 14 transgenic lines were obtained. The transgenic plants were transplanted to soil and grew normally in greenhouse. Of the 12 transgenic lines screened, the cut flower vase life of 8 transgenic lines is up to 11 days and the longest one is 12.8 days while the vase life of the control is 5.8 days under 25°C. The vase life of 2 lines out of 3 with single sense ACO gene is same as that of the control, while the vase life of 3 lines out of 4 with single antisense ACO gene is prolonged. The vase life of cut flowers of 5 lines with direct repeat ACO genes is all prolonged by about 6 days, while the vase life of 3 out of 7 lines with single ACO gene is same as that of the control. During the senescence of cut flowers, the ethylene production of the most of the transgenic lines decreased significantly, and the production of ethylene is not detectable in lines T456, T556 and T575. The results of the research demonstrate that antisense foreign gene inhibits expression of endogenesis gene more significantly than sense one. Both sense direct repeat and antisense direct repeat foreign genes can suppress endogenous gene expression more significantly comparing to single foreign genes. The transgenic lines obtained from this research are useful to minimize carnation cut flower transportation and storage expenses.