

Abstract:

Gene expression profiles of cut Iris and carnation flowers were studied using cDNA microarrays. The cDNA libraries were enriched for flower-specific genes by subtraction with cDNA from subtending growing tissue. This strategy is meant to eliminate most household genes and numerous genes that are not specific for petals and senescence. In Iris, we spotted about 1400 clones and in carnation about 2000, of which 220 and 90 clones respectively were (partially) sequenced.

Unexpectedly, during Iris senescence up-regulation was observed for many genes that previously had been characterized as being defence-related. Although such genes were also found in carnation, their relative contribution to the changes in expression seemed less pronounced. Another remarkable result was the limited number of known ethylene-related genes in carnation that were detected. Among those found was ACO1. Other ethylene-related genes may have been lost in the subtraction; and ACO1 seems specific for the ethylene climacteric. No ethylene-related genes were found in Iris. Since ethylene does not regulate petal senescence in Iris this is no surprise.

Some similarities were found between Iris and carnation. In both species a considerable proportion of the up-regulated genes encode enzymes that are involved in the degradation of lipids, protein, and complex carbohydrates such as cell walls. Several genes involved in signal transduction and in transcription were observed to change expression levels in both species, but none were the same in both species, as judged from the limited sequence information. A novel EIN3 (EIL) transcription factor was discovered in carnation. The expression pattern of some putative transcription factors in carnation were expressed independently of ethylene treatment, and may be candidates for early regulators of traits such as ethylene sensitivity.

The detailed results on Iris have been published in the December 2003 issue of *Plant Molecular Biology* (53: 845-865); the results on carnation have been submitted.