(05-1-31)

Anthocyanin accumulation by the R2R3 MYB transcriptional factor

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Objectives

We generated transgenic tobacco that expressed the R2R3 MYB transcriptional factor gene from Arabidopsis. The R2R3 MYB transcription factor controlled the induction and accumulation of anthocyanin synthesis. So that, the R2R3 MYB transcriptional factor expression in the plant lead to visible anthocyanin pigment accumulation that will be good index of transgenic plant selection.

Materials and Methods

1. Materials

   Plant: Tobacco (cv. Xanthi)

2. Methods

   mRNA isolation and cDNA synthesis, PCR, Northern blot analysis

   Construction of plant expression

Results and Discussions

The rapid development of plant genetic engineering has led to the creation of various transgenic plants. Since the first transgenic plant was developed in tobacco in 1984, transgenics in several economically important plants resistant to herbicides, insects, diseases, and also with superior nutritional and post-harvest quality were developed, some of which are already in use. However, many consumer and public groups are opposed to the cultivation and commercialization of transgenic plants. To commute the concerns for GM crop, visible native gene, which isanthocyanin pigment 1-Dominant (Pap1-D) that is the R2R3 MYB transcriptional factor, was used for tobacco transformation. Regenerated plantlets were grown to normal plants in pot. Under intensive light condition, wild type plants showed the light purple coloration in leaf and stem. However, under the same stress condition, transgenic tobacco plant displayed the dark purple coloration, suggesting that the Pap1-D gene might in part influence enhancement of the anthocyanin biosynthesis gene expression. The expression of Pap1-D in transgenic plants was confirmed by Northern blot analysis. Further characterization of transgenic plants is under study in term of anthocyanin induction and accumulation.

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