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## Behavior of tocopherol methyltransferase (*tmt*) gene in the transgenic Perilla (*Perilla frutescens*) plants

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### Objectives

This study was conducted to confirm high  $\alpha$ -tocopherol and establish stable bio-safety assesment for the Perilla transgenic plants.

### Materials and Methods

#### 1. Material

Transgenic Perilla Plants - harboring *tmt-bar* 20 Fixed lines

#### 2. Methods

##### ○ Confirmation of the transgenic perilla

Segregation of the transgenes in the progeny was assessed by selectable marker(*bar*). Also the transgene integration patterns and gene expression were determined by Southern and Northern blot analysis.

##### ○ Tocopherols composition of the transgenic perilla seeds

The concentration and composition of tocopherols and the HPLC chromatogram of transgenic perilla seeds were analyzed.

### Results and Discussion

Perilla genetic modification was performed in order to alter the vitamin E composition aimed at understanding the good food quality as a change  $\gamma$ -tocopherol to  $\alpha$ -tocopherol. As a result, We obtained 20 lines of transgenic perilla plants from the NIAB and NICS(RDA). In order to confirm the *tmt* gene in the genome, We screened the individual transformed perilla using a polymerase chain reaction (PCR) and genomic Southern blot analysis. The expression of introduced-*tmt* gene was confirmed in early stage seeds of perilla by Northern blot. As the tocopherol composition in the transgenic perilla seeds was analyzed by HPLC, the data showed that more  $\gamma$ -tocopherols in the transgenics were converted into  $\alpha$ -tocopherol than wild types. Although we confirmed the *tmt* gene in the perilla like results mentioned above, We require further study to develop high  $\alpha$ -tocopherol perilla.