

P 51

## Control of Seed Germination Rate by the Cysteine Proteinase Inhibitor in Transgenic Tobacco Plant

LEE, Eun-Young · HONG, Joon-Ki · CHO, Moo-Je · LIM, Chae-Oh\*

Department of Molecular Biology, Gyeongsang National University, Jinju 660-701, Korea

### Objectives

Phytocystatins (PhyCys) are widely distributed and have been found in several different species of higher plants. Although the metabolic role of this enzyme has not been fully defined, it has been reported that it is associated with multiple physiological processes, including seed ripening, germination and programmed cell death. However, almost PhyCys information are *in vitro* data. To study the real *in vivo* roles of PhyCys in plant cell, we isolated a cDNA clone for PhyCys from Chinese cabbage flower bud cDNA library, introduced it in tobacco, and characterized phenotypic characteristics and its seed germination control effects.

### Materials and Methods

#### 1. Materials

- Plants: Chinese cabbage (*Brassica campestris* L. ssp. *pekinensis*)
- Tobacco (*Nicotiana tabacum* cv. Xanthi-NN)

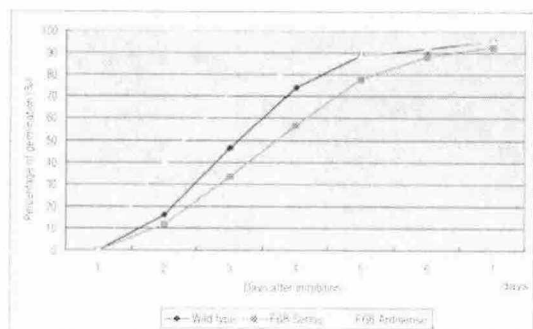


Figure 1. The comparison of germination rate between BCPI-1 transgenic and wild type tobacco plants.

- Vector: pBI 121-Linker
- Insert: BCPI-1 cDNA
- Host : *Agrobacterium* strain: LBA 4404

#### 2. Methods

- Vector construction, Tobacco transformation, Gene expression analysis (Western blotting, Cysteine protease inhibitory activity, PCR, RT-PCR), Seed germination rate

### Results and Discussion

The morphologies of transformed *N. tabacum* plants expressing *BCPI-1* sense and antisense were compared to those of untransformed control plants. Transgenic plants did not exhibit any significant morphological abnormalities under normal growth conditions. However, a number of plants expressing *BCPI-1* sense or antisense (as determined by protein immunoblot analysis) exhibited abnormalities, including flower number, seed pod size, growth and seed germination rate (Figure 1, 2). Our result suggest that the *BCPI-1* functions are related with the regulation of seed germination and plant growth.

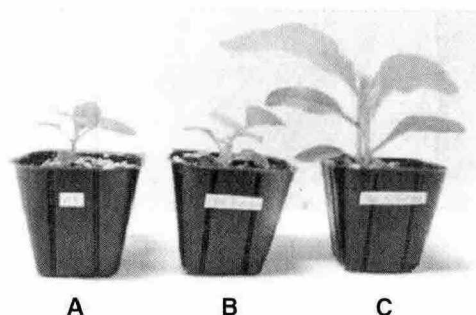


Figure 2. Growth of transgenic plants at soil condition. A, Wild type; B, BCPI-1 sense; C, BCPI-1 antisense plants.