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Chinese Cabbage Cysteine Proteinase Inhibitor, *BCPI-1*, Retards the Seed Germination and Plant Growth in Transgenic Tobacco Plants

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Objectives

To study the possible role of Chinese cabbage cysteine proteinase inhibitor (*BCPI-1*), we introduced the *BCPI-1* sense and antisense configuration into tobacco plants and investigated the phenotypic characteristics of the resultant transgenic plants.

Materials and Methods

1. Materials : *N. tabacum* L. cv. Xanthi, *Agrobacterium tumefaciens* LBA4404, pBI121-linker transformation vector
2. Methods : Construction of transgenic tobacco plants, Inhibitory activity, Western blot analysis

Results and Discussion

Constitutively over-expressed *BCPI-1* plants showed retarded seed germination and early seedling growth comparing with wild type and *BCPI-1* antisense plants. This suggests that the function of the introduced *BCPI-1* gene is related to the proposed role of PhyCys in regulating the activity of endogenous enzymes, which might be involved in seed germination and post-germination development. The growth of the *BCPI-1* sense plants were significantly stunted compared with wild type and antisense plants in soil. However, the leaf number of mature plants were similar with each other at the first flowering time. These results suggest that the *BCPI-1* has an effect on seed germination and early seedling growth and that this inhibitory effect causes growth stunting in mature plants.

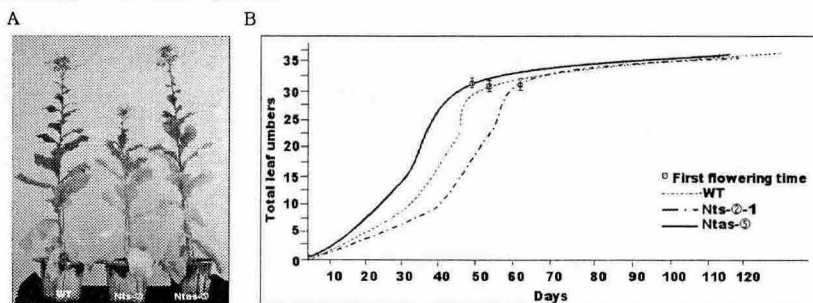


Fig. 1. Analysis of *BCPI-1* transgenic plants. (A) Comparison of the whole-plant morphology of 9-week-old T_3 plant of transgenic sense (Nts-②), antisense (Ntas-⑤) and untransformed (WT) lines. (B) Flowering time of transgenic lines and untransformed lines. Time of flowering was measured in terms of total leaf number (Y-axis) or days until the first flower appeared (X-axis) in the T_3 generation. Data reflects the mean and SE for 3 transgenic lines at high levels, and 3 untransformed lines.

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