



Molecular cloning and expression of the male sterility-related CtYABBY1 gene in flowering Chinese cabbage (*Brassica campestris* L. ssp *chinensis* var. *parachinensis*)

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ABSTRACT. Expression of the YABBY gene family in the abaxial surface of lateral plant organs determines abaxial destiny of cells, enhances growth and expansion of lateral organs, and plays an important role in polar establishment of lateral organs. However, the YABBY gene has not been studied in male sterility and fertility restoration. We homologously cloned the CtYABBY1 gene of male-sterile TC1 in *Brassica campestris* L. ssp *chinensis* var. *parachinensis*; its expression was analyzed by real-time PCR. A 937-bp sequence was cloned from TC1 and named CtYABBY1. The ORF of this gene has 702 bp, contains a “C₂C₂ zinc finger” motif at the N-terminal end, and a “YABBY” structural domain at the C-terminal end. This gene had the highest homology with DBC43-3-2 gene in *B. campestris* ssp *pekinensis*. Expression of CtYABBY1 gene has a wide range of functions. It is involved in growth and development

of lateral organs, such as leaves and flowers, enhancing expansion of the area and volume of young organs. CtYABBY1 is a gene that promotes thermo-sensitive fertility restoration. At room temperature, expression level of this gene was found to be lower in the stamens of sterile flowers. After treating TC1 at a low temperature of 2°-6°C for 20 days, expression of this gene was upregulated in the stamen of fertile flowers. We conclude that male sterility in TC1 is negatively regulated by this gene, which facilitates transition from male sterility to fertility.

Key words: Homologous cloning; Gene expression; Male sterility; YABBY gene family; Fertility restoration