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Analysis of a new Spikelet Identity gene Mutant "*fzp*-9(t)" in Rice

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Objectives

DNA characterization and phenotype evaluation of flower organ related mutants "fzp-9(t)" for gene functional analysis.

Materials and Methods

1. Material

The *fzp* mutant was isolated from anther culture–derived lines of "YR 20917 Acp 6," in YARI.

2. Methods:

SEM analysis: Hitachi S-3000, Hitachi High-Technology Corp., Tokyo, Japan, with accelerating voltage of 15 kv.

Sequence alignments: ClustalW program (**www.ch.embnet.org/software**/ClustalW.html).

Results and Discussion

The spikelet identity gene "*fzp*" (frizzy panicle) is required for transformation of the floral meristems to inflorescent shoots. In *fzp* mutants, spikelets are replaced by branches and spikelet meristems produce massive numbers of branch meristems. We have isolated and characterized a new *fzp* mutant derived from anther culture lines in rice and designated as *fzp-9*(t). The *fzp-9*(t) mutant showed retarded growth habit and developed fewer tillers than those of the wild-type plant. The primary and secondary rachis branches of *fzp-9*(t) appeared to be normal, but higher-order branches formed continuous bract-like structures without developing spikelets. The genetic segregation of *fzp-9*(t) showed a good fit to the expected ratio of 3:1. The sequence analysis of *fzp*-9(t) revealed that there is a single nucleotide base change upstream of the ERF (ethylene-responsive element-binding factor) domain compare to wild-type plant. The mutation point of *fzp-9*(t) (W66G) was one of the six amino acids of the ERF domain that contributed to GCC box-specific binding. The premature formation of a stop codon at the beginning of the ERF domain might cause a non-functional product.

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