Isolation, characterization, and map-based cloning of staygreen gene in rice. (C07-paek175043-Poster)

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Abstract:

Leaf color turns yellow during senescence due to the degradation of chlorophylls and photosynthetic proteins. A stay-green mutant was isolated from the glutinous japonica rice Hwacheong-wx through N-methyl-Nnitrosourea mutagenesis. Leaves of the mutant remained green while turning yellow in those of the wild-type rice during senescence. The stay-green phenotype was controlled by a single recessive nuclear gene, tentatively symbolized as sgr(t). All the phenotypic characteristics of the mutant were the same as those of the wild-type lines except for the stay-green trait. Leaf chlorophyll concentration of the mutant was similar to that of the wild type before heading, but decreased steeply in the wild type during grain filling, while very slowly in the mutant. However, no difference in photosynthetic activity was observed between the stay-green mutant and the yellowing wildtype leaves, indicating that senescence is proceeding normally in the mutant leaves and the mutation affects the rate of chlorophyll degradation during the leaf senescence. Using phenotypic and molecular markers, we mapped the sgr (t) locus to the long arm of chromosome 9 between RFLP markers RG662 and C985 at 1.8 and 2.1 cM intervals, respectively. Using 11 RFLP ESTs and 18 BAC clones between two markers (approximately 550 kb), we are currently performing the map-based cloning of sgr(t) gene.

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