

CHARACTERIZATION OF COLD RESPONSIVE  
T-DNA TAGGING LINES OF RICE (*Oryza sativa*)

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In order to understand the low-temperature response mechanism in plants,  $\beta$ -glucuronidase (GUS) gene-trapped rice plants were screened for the cold-induction of GUS. Among 6286 lines, 58 lines (0.9%) showed differential GUS activity by 5°C treatment compared to control. Of the 58 lines, 15 were also responsive to abscisic acid (ABA) suggesting that the cold-induction of those lines may be via the ABA-dependent pathway. The tagged genes were identified by inverse PCR, DNA sequencing, and web-based annotation. In a tagging line 20539, T-DNA sequence was inserted downstream of hypothetical protein gene that has a pentatricopeptide (PPR) repeat. The repeat occurs in the genes involved in RNA stabilization/processing. In 16267 line, T-DNA sequence was found at the upstream region of receptor protein kinase (RPK) gene. Quantitative RT-PCR analysis showed that the hypothetical protein gene was up-regulated by the cold stress. However, expression of the RPK gene was decreased during first 3 hr after the cold stress, and then up-regulated thereafter. Functions of the genes in the cold response are examined. Characterization of the tagged genes may give insights into the cold response mechanism in this chilling damage-prone model plant.

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