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Allelic Distribution of *OsPRR37*, a Major Heading Date Gene in Korean Rice Cultivars

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[Abstract]

Rice is a major food crop consumed by approximately half of the world's population. Heading date is one of the major agronomic traits and has a wide impact on the productivity and quality of rice. Recently, shortening the growth period of rice through modulating heading date has been emphasized as one of the most effective strategies for reducing methane emissions from paddy fields. *OsPRR37*, a major heading date gene in rice, represses flowering under both short-day and long-day conditions. Plants carrying the loss-of-function alleles of *OsPRR37* have been reported to flower approximately seven days and 20 days earlier than those carrying the functional alleles in short day and long day conditions, respectively. In this study, we investigated the nucleotide sequence variation existing in the exonic regions of *OsPRR37* and catalogued the allelic distribution in 208 Korean rice cultivars. We used four sets of primers for amplifying and sequencing the eight exons of *OsPRR37*. As a result, two types of loss-of-function alleles and four types of functional alleles were found in 208 Korean rice cultivars. Interestingly, only three cultivars (Jinbuolbyeon, Jinseolchal, and Mimyeon) carried loss-of-function alleles while 205 carried functional alleles, indicating that *OsPRR37* loss-of-function alleles have been used very rarely in Korean rice breeding programs. To generate useful information for the development of early-maturing rice cultivars, our future work will focus on analyzing the effect of different *OsPRR37* alleles on heading date and other major agronomic traits.

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