



Five Rice Seed-Specific NF-YC Genes Redundantly Regulate Grain Quality and Seed Germination via Interfering Gibberellin Pathway

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Abstract

NF-YCs are important transcription factors with diverse functions in the plant kingdoms including seed development. NF-YC8, 9, 10, 11 and 12 are close homologs with similar seed-specific expression patterns. Despite the fact that some of the NF-YCs are functionally known; their biological roles have not been systematically explored yet, given the potential functional redundancy. In this study, we generated pentuple mutant pnfyc of NF-YC8-12 and revealed their functions in the regulation of grain quality and seed germination. pnfyc grains displayed significantly more chalkiness with abnormal starch granule packaging. pnfyc seed germination and post-germination growth are much slower than the wild-type NIP, largely owing to the GA-deficiency as exogenous GA was able to fully recover the germination phenotype. The RNA-seq experiment identified a total of 469 differentially expressed genes, and several GA-, ABA- and grain quality control-related genes might be transcriptionally regulated by the five NF-YCs, as revealed by qRT-PCR analysis. The results demonstrated the redundant functions of NF-YC8-12 in regulating GA pathways that underpin rice grain quality and seed germination, and shed a novel light on the functions of the seed-specific NF-YCs. [View Full-Text](#)

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