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Special Issue Reprint

Recent Advances in Plant Genetics and Genomics

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The publication of the genomic sequence of *A. thaliana* in 2000 and of a *O. sativa* in 2002 marked the beginning of an exciting era in which advances in technology and methodology uncovered the genetic blueprints of hundreds of plant species.

In recent years, a rice pangenome and genome navigation system—RiceNavi—has been developed for QTN polymerization and breeding route optimization. The *Oryza* super pangenome, which has the largest population size of plants and fully annotated genomes, has also been constructed. Several nitrogen-efficient genes have been identified and their molecular mechanism of nitrogen efficiency has been dissected. The expression of some genes can significantly increase rice yield under experimental conditions. Significant progress has also been made in research relating to the mechanism of rice broad-spectrum disease resistance, temperature response, and salt–alkali resistance. In gene editing, a new polynucleotide-targeted deletion system—AFIDs (APOBEC-Cas9 fusion-induced deletion systems)—has been established, successfully achieving accurate and predictable polynucleotide deletion in rice and wheat genomes. Using CRISPR/Cas9 technology, gene editing has produced many practical new materials including the rice apomixis material. This Special Issue of Plants will highlight the allelic gene identification, function, evolution, and diversity of rice germplasm resources at the genomic and RNA-seq levels, as well as their breeding applications.

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