Science Societies

Gene editing for healthier rice

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Dr. Endang Septiningsih (right) and postdoctoral research associate Dr. Sudip Biswas work on gene editing in rice in the Crop Genome Editing Lab at Texas A&M University.

Resistant starch, which resist being broken down in the digestive system, may benefit human health and reduce the risk of diet-related chronic diseases. Rice, however, has low levels of this kind of starch. Scientists have worked to improve rice resistant starch levels, but targeting multiple genes at once has not been done so far.

As recently reported in *The Plant Genome*, a research team from Texas A&M University has developed rice with higher levels of resistant starch through the use of multiplex CRISPR-Cas9 editing. The scientists knocked out four starch branching enzyme (SBE) genes in the background of the U.S. rice cultivar Presidio.

The team identified transgene-free T1 lines with different combinations of disrupted SBE genes and several SBE-edited lines showing significantly increased resistant starch content—up to 15% higher than the wild-type cultivar Presidio.

Although further efforts are needed to fix all of the mutant alleles as homozygous, the study demonstrates the potential of multiplex genome editing to develop rice lines with higher levels of resistant starch for improved human nutrition.

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Biswas, S., Ibarra, O., Shaphek, M., Molina-Risco, M., Faion-Molina, M., Bellinatti-Della Gracia, M., Thomson, M.J., & Septiningsih, E.M. (2022). Increasing the level of resistant starch in 'Presidio' rice through multiplex CRISPR–Cas9 gene editing of starch branching enzyme genes. *The Plant Genome*, e20225. **https://doi.org/10.1002/tpg2.20225**

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