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## FINDINGS

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Title of Ph.D. thesis: **Engineering Low Glycemic Rice by Targeted Editing of Genes Encoding for Soluble Starch Synthesis Enzymes"**

Name of Research Scholar: **Mohd Rizwan Jameel**

Centre: **Centre for Interdisciplinary Research in Basic Sciences (CIRBSc), Jamia Millia Islamia, New Delhi 110025.**

Supervisor: **Prof. Zubaida Ansari (CIRBSc., JMI,ND-25).**

Co-Supervisor: **Dr. M. Irfan Qureshi (Department of Biotechnology, JMI, ND-25) and Dr. M.K. Reddy (International Centre for Genetic Engineering and Biotechnology, ND-67).**

### Findings

In the present study, selected rice (*Oryza sativa* cv. indica) was genetically modified to increase amylose content in seeds. The 'CRISPR-Cas9 genome editing tool was used to knock out three isoforms of soluble starch synthase (SSS) viz. *SSSII-1*, *SSSII-2* and *SSSII-3*. A genetic transformation vector designed with appropriate gRNAs, Cas9, and antibiotic resistance was used to create SSS knockout mutants with an aim to enrich the content of amylose. Developed successfully, the putative rice mutants were rich in amylose content in the seeds; 63% in the best mutant as compared to 23% in wild types (control). The frequencies of bi-allelic or homozygous transgenic lines of *SSSII-1*, *SSSII-2*, and *SSSII-3* in the first generation were tested in a Mendelian fashion of segregated bi-allelic lines in the T1 generation of putative rice mutants. The T1 generation segregation showed a frame-shift mutation. Molecular characterization of putative mutants successfully demonstrated the development of Cas9-free rice mutant with a high amount of amylose in rice.