

Plant Genomics 2019 : Genome editing in chili pepper using a CRISPR/Cas9 Cytidine base editing system

Abstract:

Anthrachnose, caused by *Colletotrichum* species complex is the most devastating disease of chili pepper (*Capsicum annuum*) in the tropical and subtropical regions of the world. Attempted management of chili anthracnose through conventional approaches hasn't met with tangible success. CRISPR/Cas9 based precise and predictable targeted point mutations has emerged as the most powerful alternative in plant breeding without the need for a foreign DNA donor or double stranded DNA cleavage. We have used a CRISPR/Cas9 fused Cytidine Base Editing (CBE) system for precise editing of NAC72 locus in Chili pepper using *Agrobacterium*-mediated transformation approach. The CBE efficiently edited the targeted cytidine bases leading to anthracnose resistance with precise base edition efficiency up to 69% in chili pepper. The outcomes from this study will be deliberated to demonstrate that base editing could facilitate precision molecular breeding in plants for specific trait improvement.

Biography:

Raj Kumar Joshi is Associate Professor at the Dept. of Biotechnology, Rama Devi Women's University, India where he teaches graduate level courses on Plant Genomics and Genetic Engineering. He also serves as the Group Leader of the Plant Functional Genomics Group, and in that capacity he supervises the overall research activities on the functional aspects of molecular plant-microbe interactions. He has been awarded with the prestigious SERB early career grant and SERB extramural grant from the Dept. of Science and technology, Govt. of India and CREST award from Dept. of Biotechnology, Govt. of India. In collaboration with Prof. Nat Kav from University of Alberta, Canada, he is running a successful program on the delineation of molecular networks in the interaction between plants and fungal phytopathogens. His recent forays into genome editing and precise base editing towards improvement of these crops has been highly productive.

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