



INTROGRESSION OF BACTERIAL BLIGHT RESISTANCE GENES; Xa33 AND Xa38 INTO RICE GENOTYPE ADT 47 THROUGH MARKER ASSISTED SELECTION

¹Ahmed, A., ²Ramalingam, J. and ³Sheriff, H. H.

¹Cereals research Lake Chad Research Institute Maiduguri, Borno State, Nigeria.

²Tamil Nadu Agricultural University, Coimbatore, India.

³Farming System Research Lake Chad Research Institute, Maiduguri, Borno State, Nigeria.

Corresponding Authors' E-mail: auwalbob@gmail.com **Tel.:** 08036823676

ABSTRACT

Bacterial blight is one of the serious diseases of rice. Utilization of resistant varieties is considered to be the most effective method of control. ADT 47 rice genotype has nearly been improved with the blight resistance genes xa5, xa13 and Xa21, through marker assisted selection (MAS). As the objective of this study, marker assisted backcrossing breeding (MABB) was adopted for targeted introgression of the broad spectrum resistance genes, Xa33 and Xa38 to the Improved ADT 47 rice variety. The rice genotypes FBRI-15, PR114 were used as donors of Xa33 and Xa38 genes, respectively. The marker RMWR7.1 linked to Xa33 and the sequenced-tagged site marker Os04g53050-1 specific to Xa38 were validated in parents who were used for foreground selection. True F₁ hybrids were selected using the polymorphic markers. Out of one hundred and thirty seven SSR markers, forty-two were polymorphic for Improved ADT 47 x FBRI-16 which was used for background selection. Foreground selection revealed that a single F₁ plant was heterozygote in Improved ADT 47 x FBRI-15 and it was used to develop BC₁ generation. At BC₁F₁, one plant was found to be heterozygous for Improved ADT 47 x FBRI-15. At BC₂F₁, a single plant was found heterozygous as well from the cross. In the final BC₃F₁ population, one heterozygous plant was validated from the cross, the plant was subjected to background selection for selecting plants having the genetic background similar to that of the recurrent parent (i.e., confirmation of recurrent parent genome recovery) using the forty-two dominant SSR markers. In BC₃F₁, there was a 92.80% parental genome recovery in the Improved ADT 47 x FBRI-15. This high parental genome line was selfed to produce BC₂F₂ for selection of homozygous lines for xa5, xa13, Xa21 and Xa33/Xa38. The study recommends that the BC₂F₂ plants will be selfed using pedigree method and then advance to preliminary yield trial (PYT), then Advanced yield trial (AYT) and finally to on farm assessment for release.

Keywords: Bacterial Blight, genotype, Rice, ADT47, Xa33, Xa38.