

IDENTIFICATION OF BACTERIAL LEAF BLIGHT (*XANTHOMONAS ORYZAE*) RESISTANCE GENES IN INDICA RICE (*ORYZA SATIVA* L.) THROUGH MOLECULAR MARKERS AND MORPHOLOGICAL CHARACTERIZATION FOR CROP IMPROVEMENT STRATEGY

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Abstract: The present study was undertaken to confirm the presence of genes responsible for resistance to bacterial leaf blight disease. Ninety-two rice genotypes evaluated for bacterial leaf blight resistance in the natural condition and under induced epiphytotic conditions. Four gene-specific primers were used to identify bacterial leaf blight resistant genes in these genotypes. Gene-specific markers linked to BLB resistant appeared as *Xa4*_{150bp} (STS marker RM224) in 66 rice genotypes, *xa5*_{1300bp} (STS marker RG556) in 8 rice genotypes, *xa13*_{1000bp} (SNP marker RG136) in 73 rice genotypes and *Xa21*_{1000bp} (STS marker pTA248) in 32 rice genotypes. The seventy-one resistant genotypes had a varying number of BLB resistant genes. All four BLB resistance genes were detected in BC₁F₉ P16, BC₂F₇ P6, and BC₂F₇ P8 lines. Seventeen rice genotypes having a varying number of BLB resistance genes but unable to express resistance in the field conditions due to the effect of environmental factors. The lines BC₁F₉ & BC₂F₇ involved in this study had *xa13* in all the 38 lines (BC₁F₉ & BC₂F₇), while *Xa21* was observed in thirty-one out of 38 lines. The lines BC₁F₉ & BC₂F₇ were found to be BLB resistant at molecular level & artificial induced condition. Application of back cross method was found successful to develop BLB resistant rice varieties using PR106 P2 as donor parent.

Keywords: Gene-specific markers, BLB, Epiphytotic conditions

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