

Research Article

Proteome Analysis in Rice Plants Treated with Fungicide Premixture (Fenoxanil 5% and Isoprothiolane 30% EC) Against Blast Disease and Assessing their Bioefficacy and Phytotoxicity

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Abstract

Rice blast disease was managed mostly by application of systemic fungicides. In this connection, a field experiment was conducted at Anthiyur village of Erode district for two seasons in the year 2012 and 2013 to evaluate the newer premixture fungicide (Fenoxanil 5% and Isoprothiolane 30% EC), Fenoxil 20% SC, Isoprothiolane 40% SC and Tricyclazole 75% WP with different concentrations against rice blast disease. Among them, application of premixture molecule (Fenoxanil 5% and Isoprothiolane 30% EC) 35 % EC at the dosage of 1000 ml/ha significantly reduced blast incidence and increased the grain yield under glass house and field conditions.

The defense molecules *viz.*, PAL, PO and PPO were enhanced in premixture fungicide 35% EC treated rice plants against blast pathogen. Two-dimensional electrophoresis strategy was adopted in three way interaction of fungicide-host-*M. oryzae*. The result revealed that totally 25 proteins spots were differentially expressed. Among them, eleven proteins were altered by the pathogen for successful disease development but it was arrested in fungicide premixture+pathogen treatments. In additions 14 proteins were up regulated in fungicide treatment. However three proteins were newly expressed in fungicide alone applied plants. These results suggest that application of fungicide premixture altered the protein expression for inducing resistance against blast. Hence this study revealed that the performance of fungicide premixture 35 % EC (Fenoxanil 5% and Isoprothiolane 30% EC) were highly effective against blast disease and enhanced rice grain yield. From this study, proteomic strategy unravels the fungicide mediated mechanism of resistance in rice against blast disease.

Key words: Chemical control, defense enzymes, newer fungicides, proteomics, rice blast

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