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Role of Exogenous Gibberellic acid and Methyl Jasmonate Against White-backed planthoppers Stress in rice

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[Introduction]

Rice (*Oryza sativa* L.) is one of the essential staple food for more than half of the world population. The White-backed plant hoppers (WBPH, *Sogatella furcifera*) cause significant damage to rice plants, which lead to huge economic losses due to reduced production. To overcome these effects the host plants produced different types of hormones. Several genes related to biotic stress show response to biotic stress condition. In this study we will find the gene expression of some related genes and will study antioxidant and other things.

[Materials and Methods]

Rice cultivar Ilmi was used as a plant material. Six groups of plants were selected to evaluate the exogenous effects of GA and MeJA treatment against WBPH on rice plants. 21-days old plants were transferred to pots having three replicates of each group. At the same time, plants were infested with WBPH and were treated with hormones. For relative gene expression samples were collected at different timepoints. For hormones, antioxidant and other analysis, samples were collected according to the experimental design. The agronomic data were collected after the maturation of the seeds.

[Results and discussion]

We applied exogenous hormones (Gibberellic acid and Methyl Jasmonate) to WBPH infested rice plants and perform different analysis. The transcriptional regulator (*OsGAI*) and gibberellic acid-mediated signaling regulator (*OsGID2*) genes were upregulated by GA treatment. GSH was significantly enhanced by GA and MeJA treatment. Meanwhile, CAT and POD were significantly reduced in the control. Additionally, MeJA was accumulated in the control and plants treated with 50 μ M MeJA or 100 μ M GA. H₂O₂ accumulation was decreased in GA-treated plants, while cell death was more extensive in MeJA-treated plants. In conclusion, the exogenous application of GA may help rice resist and overcome the effects of WBPHs.

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