

EFFECT OF GR24, A SYNTHETIC ANALOG OF STRIGOLACTONES, ON PHYSIOLOGICAL AND MORPHOLOGICAL ACTIVITIES OF *Ustilago maydis*

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Abstract

The Basidiomycetes fungi *U. maydis* is the causal agent of head smut of maize and sorghum. This fungus has haploid, diploid and dikaryotic forms in its life cycle. Fusion of compatible haploid cells on leaf is required to generate dikaryon form that is capable of plant infection. Although, *U. maydis* can penetrate through the roots and aerial parts but the disease symptoms only appear on the aerial parts. As regards root exudates play an important role in the plant-microb interactions, in this study, the effect of GR24 (as a analogue synthesis of strigolactones) on the physiological and morphological activities of *U. maydis* was investigated.

Using different methods to measure cellular respiration, rates of respiratory changes after adding GR24 was measured. Our observation show that one hour after this induction, cell respiration increased 11 percent but in three and five hours cells induced respiration was found to be reduced by eight and five percent, respectively. This reduction can be due to detoxification effects of fungi in counter with exogenous molecule. Gene expression levels of some genes involved in biotrophy and cell respiratory were assayed using the Real-time PCR approach. The results show that gene expression involved in cellular respiratory was increased in induced cells by GR24 in compared to control cells. Nevertheless GR24 didn't effect on the morphological change and the yeast- mycelial form transition of haploid strain of *U. maydis*. This molecule could affect on root penetration and plant defense reactions by increase of cell respiration but has any role to play pathogenesis.

Keywords: Morphological changes, Cellular respiration, Biotrophic genes, GR24, *Ustilago maydis*

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