

Transcriptome analysis of postharvest grapes in response to *Talaromyces rugulosus* O1 infection

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Abstract

Grapes are high nutritional and economic fruit but extremely vulnerable to fungus infections during postharvest storage. Our previous study found that the fungi, *Talaromyces rugulosus* O1 secretes ochratoxin A (OTA), which inflicts consumer health and economic value. This study found that *T. rugulosus* O1 has strong pathogenicity and spore germination to produce germ tubes to help it infect grapes. To better understand the molecular interaction between *T. rugulosus* O1 and grape, RNA sequencing (RNA-seq) was performed, and 5037 genes were identified as differentially expressed genes (DEGs) in grapes after *T. rugulosus* O1 infection. RNA-seq analysis revealed that *T. rugulosus* O1 infection, induced complex defense reactions in grapes, including an influx of Ca^{2+} , oxidative burst, changes in GSH, plant hormone signal transduction, transcription factor regulation, overexpression of protein kinases, and biosynthesis of plant secondary metabolites. Our study found that the activity of the resistance enzymes in grapes was increased after *T. rugulosus* O1 infection, which is consistent with the RNA-seq results. Moreover, the accumulation of some antifungal compounds, including flavonoids, phenols, and lignin in grapes, increased grapes' antifungal ability.