Heat stress alters the transcriptome of *Debaryomyces hansenii* and reduces its biocontrol activity against postharvest gray mold on kiwifruit

Yuan Dai, Zhenshuo Wang, Jinsong Leng, Qi Wang and Jia Liu

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Abstract

Heat stress plays an important role in a postharvest biocontrol system. A basic understanding of heat stress response is crucial to the use of antagonistic yeasts as postharvest biocontrol agents. In the present study, heat stress (42 °C, 20 min) decreased the biocontrol efficacy of the yeast antagonist, *Debaryomyces hansenii*, against gray mold, caused by *Botrytis cinerea,* on kiwifruit. RNA-seq was used to conduct a comparative transcriptomic analysis of heat-treated vs. non-heat-treated cultures of *D. hansenii.* A total of 9775 transcripts comprising 7805 unigenes were obtained from the two treatment groups by *de novo* assembly. A set of 706 differentially expressed genes (DEGs) were identified between the two treatment groups, comprising 376 up-regulated DEGs and 330 down-regulated DEGs. The identified DEGs were mainly associated with response to stimulus, biological regulation, and developmental process. RT-qPCR analysis was conducted on a subset of eight genes to corroborate the results of the RNA-seq data. The present study provides new information on the molecular response of biocontrol yeasts to heat stress.