

Title Effect of heat shock treatment on stress tolerance and biocontrol efficacy of biocontrol yeasts

Author J. Liu and M. Wisniewski

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Abstract

Several different species of yeasts have been used as biocontrol agents against postharvest diseases of fruits and vegetables. Our current research is directed to develop a better understanding of yeast biology in relation to biocontrol activity and to develop strategies to improve the efficacy of their biocontrol activities. The effect of a mild heat shock (HS) pretreatment (30 min at 40°C for *Metschnikowia fructicola*; or 20 min at 40°C for *Candida guilliermondii*) on the tolerance of to subsequent high temperature (45°C) and oxidative stress (0.4 mol L⁻¹ H₂O₂) was evaluated. The viabilities of the two yeasts subjected to both stresses were enhanced by the pretreatment. Additionally, the HS yeasts showed better biocontrol efficacy against *Penicillium expansum* and higher population on apple fruits stored at 25°C compared to the performance of untreated yeast cells. The trehalose content in *M. fructicola* or *C. guilliermondii* also increased. Results indicate that induction of trehalose content by HS pretreatment may contribute to improvement in stress tolerance, population dynamics and biocontrol efficacy of the two biocontrol yeasts.