

Title Effect of heat treatment on inhibition of *Monilinia fructicola* and induction of disease resistance in peach fruit

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Citation Postharvest Biology and Technology, Volume 65, March 2012, Pages 61–68

Keywords Defense response; Heat treatment; *Monilinia fructicola*; Peach fruit; ROS

Abstract

Heat treatment (wet and dry) of fruit has been demonstrated as an effective approach for managing postharvest decay. Both direct antimicrobial effects on pathogen propagules as well as induction of host defense mechanisms have been suggested to play a role in the observed reduction of decay. In the present study, the effect of heat treatment (HT, hot water treatment at 40 °C for 5 and 10 min) on *Monilinia fructicola* and/or peach brown rot was investigated. HT inhibited spore germination and germ tube elongation of *M. fructicola* *in vitro*. HT also triggered the accumulation of reactive oxygen species (ROS), collapse of mitochondrial membrane potential and a decrease in intracellular ATP in *M. fructicola*. Results of the studies on peach fruit showed that HT induced the expression of defense-related genes including *chitinase (CHI)*, *β -1,3-glucanase (GNS)* and *phenylalanine ammonia lyase (PAL)*, as well as increased the activity of these enzymes in peach fruit. The HT used in this study did not appear to impair fruit quality. Our results indicate that both the direct inhibition of *M. fructicola* and the elicitation of defense responses in fruit by HT contribute to the observed reduction of decay in peach fruit.