Title Postharvest biocontrol of *Monilinia laxa*, *Monilinia fructicola* and *Monilinia fructigena* on stone fruit by two *Aureobasidium pullulans* strains

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Abstract

The antagonistic effects of yeasts, L1 and L8, isolated from carposphere of 'Redhaven' peaches were tested for the first time in the same experiment against three *Monilinia* species (*Monilinia laxa*, *Monilinia fructicola* and *Monilinia fructigena*) in *in vitro* and *in vivo* trials. The two antagonists were selected after preliminary assays for their ability to reduce brown rot in peaches and nectarines, and both were identified by molecular and morphological tools as *Aureobasidium pullulans*. In *in vivo* trials, neither the autoclaved cells, nor the sterile culture filtrates of either antagonist showed any significant reduction of rot incidence produced by inocula of the three *Monilinia* species, while the washed cells of L1 and L8 completely inhibited *M. laxa* and *M.fructicola* rots and reduced *M. fructigena*infections by 70% and 90%, respectively. In other trials, nectarines treated with antagonist cells and inoculated with the pathogens were stored at 0 °C for 21 days, plus 7 days at 20 °C. The low temperature reduced brown rot development, since all fruit were free from disease symptoms on removal from cold storage. However after 7 d at 20 °C, untreated fruit were rotted over 45% depending on the *Monilinia* species but the antagonists completely inhibited *M. laxa* and *M. fructicola*, while *M. fructigena*infections were reduced by 89.8% and 91.2% by L1 and L8, respectively. For both strains, 10^8CFU ml^{-1} was the most active concentration, although L1 showed good activity at a concentration of 10^7CFU ml^{-1}. Isolate L8 at the concentration of 10^7CFU ml^{-1} was ineffective against *M. fructicola* and *M. fructigena*, showing no difference between treated fruit and the control, excepting the case of nectarines inoculated with *M. laxa*, where L8 at the concentration of 10^7CFU ml^{-1} reduced the brown rot infections with respect to the control. The increase in population density of *A. pullulans* strains L1 and L8 in the wounds of nectarines stored at 0° or 20 °C was low but sufficient to control brown rot. In conclusion, the present preliminary study identified two antagonistic strains of *A. pullulans* as active ingredients for the development of biofungicides for postharvest application against three *Monilinia* species that are responsible for high economic losses in stone fruit crops.