

Title Real time polymerase chain reaction for rapid and quantitative determination of *Cystofilobasidium infirmominiatum* on the surfaces of apple, pear, and sweet cherry fruit

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Abstract

The objectives of this study were to develop primers and a real time PCR protocol for the postharvest biocontrol yeast *Cystofilobasidium infirmominiatum* (*Cim*). The application of this technology was developed to quantify *Cim* on the surfaces of apple, two pear cultivars, and sweet cherry fruit treated over a range of concentrations. Statistically significant relationships were observed between *Cim* DNA on fruit surfaces, expressed as $\mu\text{g}/\text{m}^2$, and CFU/L of dip suspensions for apple, pear, and sweet cherry. In addition, the relationship for each fruit was significantly different from the other three fruits. Threshold values of concentrations of *Cim* DNA on the fruit surface were calculated based on regression equations and a dose of 2.0×10^{11} CFU/L of dip suspension, the dose for optimum decay control, and were 4.8, 7.0, 16.5, and $25.2 \mu\text{g}/\text{m}^2$ for Bosc pear, Lapins sweet cherry, d’Anjou pear, and Golden Delicious apple, respectively. Monitoring *Cim* DNA concentration on fruit surfaces will assure that *Cim* is being properly applied to fruit and that a sufficient number of cells are present for optimum decay control.