Effect of fruit maturity stage of orange on the wound response to *Penicillium digitatum* (pathogen) and *P. expansum* (non-host pathogen)

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Acta Horticulturae 1053: 177-183. (2014)

Abstract

Penicillium digitatum and *P. expansum* are postharvest necrotrophic fungi that require wounds to infect the fruit. Therefore, injuries caused during harvesting and postharvest handling provide an optimal locus for infection. In this study, we evaluated the effect of wound response in oranges harvested at three different maturity stages and stored at two different temperatures (20 and 4°C), on the infection of fruit by either pathogen. The effect of wounding and pathogen inoculation on lignin content and the expression of several phenylpropanoid pathway-related genes were also analyzed. *P. digitatum* exhibited lower decay incidence and severity as the time between wounding and inoculation increased, and these differences were more evident in fruit from immature and commercial harvests. *P. expansum* was able to infect oranges, and lesions obtained at 4°C were larger than those obtained at 20°C. In general, lignin content was highest in fruit from the immature harvest. The accumulation of *pal1* and *pox1* mRNA at 24 h was higher in samples infected with both pathogens than in control samples. However, samples inoculated with *P. digitatum* showed an important decrease after 48 h. Our results indicate that maturity and storage temperature play important roles in orange wound response.