

Title Evaluation of *Penicillium expansum* isolates for aggressiveness, growth and patulin accumulation in usual and less common fruit hosts

Author Fiorella Neri, Irene Donati, Francesca Veronesi, David Mazzoni and Marta Mari

Citation International Journal of Food Microbiology, Volume 143, Issue 3, 15 October 2010, Pages 109-117

Keywords Apple; Apricot; Mycelial growth; Aggressiveness in fruit hosts; Patulin; *Penicillium expansum*; Peach

Abstract

Experiments were carried out *in vivo* and *in vitro* with four isolates of *Penicillium expansum* (I 1, E 11, C 28 and I 12) to evaluate their aggressiveness, growth and patulin accumulation in both usual (pears and apples) and less common hosts (apricots, peaches, strawberries and kiwifruits) of the pathogen. The 75% of isolates showed the ability to cause blue mould in all tested hosts. In particular, C 28 and I 1 were the most and the least aggressive isolates, respectively (52.9 and 10.6% infection and 20.7 and 15.4 mm lesion diameters). ‘Candongga’ strawberries and ‘Pinkcot’ apricots showed the largest lesion diameters (29.8 and 25.3 mm), followed by ‘Conference’ pears, ‘Spring Crest’ peaches and ‘Abate Fetel’ pears. With the exception of ‘Candongga’ strawberries, the formation of colonies and mycelial growth of *P. expansum* isolates on fruit puree agar media (PAMs) was stimulated in comparison to a standard growth medium (malt extract agar, MEA). Two of the most aggressive isolates in our assays (I 12 and C 28) showed the greatest accumulation of patulin both *in vitro* and *in vivo*, while the least aggressive isolate (I 1) produced patulin only in a few growth media and cvs. Patulin concentration on fruit PAMs was higher than patulin detected in infected fruit tissues. Apple PAMs were the more favorable substrates for patulin accumulation *in vitro* (maximum concentration 173.1 and 74.1 µg/mL in ‘Pink Lady and ‘Golden Delicious’ PAMs, respectively) and ‘Pink Lady’ apples inoculated with the isolate E 11 showed the greatest accumulation of patulin in the whole *in vivo* assay (33.9 µg/mL). However, infected tissue of cv Golden Delicious showed lower average accumulation of patulin (1.7 µg/mL) than that of cv Pink Lady (19.1 µg/mL), and no significant differences in patulin concentrations were found among ‘Golden Delicious’ apples and tested cvs of pears, kiwifruits and strawberries. Peaches were highly susceptible to patulin accumulation, showing average concentrations of 27.4 and 18.6 µg/mL *in vitro* and *in vivo*, respectively. Apricots were also consistently positive for patulin accumulation, both *in vitro* (average values of 20.1 µg/mL) and *in vivo* (average values of 9.4 µg/mL). Our study showed the potential of some less common hosts of *P. expansum* (in particular peaches and apricots) to support patulin production, indicating that a steady monitoring of patulin contamination should be carried out in fruit substrates other than apples and pears.