Title Detection of *Penicillium expansum* associated with blue mould on apples in Ontario using PCR-RFLP.

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Abstract

Blue mould (caused by *Penicillium* spp.) is one of the most important postharvest diseases of apples in southern Ontario, Canada. Although *Penicillium expansum* is the most common and aggressive species, several others such as *P. brevicompactum*, *P. crustosum*, *P. aurantiogriseum*, *P. polonicum*, *P. viridicatum*, and *P. solitum* are also known to cause blue mould symptoms. The objective of this study was to identify species of *Penicillium* present among fifty six isolates in three apple packinghouses in southern Ontario. Genotypic species identification was performed by the restriction fragment length polymorphism (RFLP) analysis of a polymerase chain reaction (PCR) amplified product from the internal transcribed spacer (ITS4 and ITS5) region of rDNA. Digestion of the ~600 bp DNA fragment, amplified from the ITS region, using restriction enzymes *Hin*fI and *Taq*I revealed distinctive banding patterns: *Hin*fI produced three bands (300, 200, and 100 bp) for *P. expansum*, and two bands (325 and 275 bp) for *P. solitum*, while *Taq*I produced three bands (275, 160, and 150 bp) for *P. expansum*, and four bands (190, 180, 170, and 60 bp) for *P. solitum*. In one exception, *Taq*I produced two bands (325 and 275 bp) for *P. brevicompactum*. The PCR-RFLP technique was successful in differentiating between all but two of the above mentioned *Penicillium* spp. Based on PCR-RFLP analysis, 53 isolates were identified as *P. expansum*, and 3 as *P. solitum*. Pathogenicity tests showed that *P. expansum* was more aggressive than *P. solitum* on apple 'McIntosh'.