

Title Mutation at β -tubulin codon 200 indicated Thiabendazole resistance in *Penicillium digitatum* collected from California citrus packinghouses

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Abstract

Thiabendazole (TBZ) is commonly applied to harvested citrus fruit in packinghouses to control citrus green mold, caused by *Penicillium digitatum*. Although TBZ is not used before harvest, another benzimidazole, thiophanate methyl, is commonly used in Florida and may be introduced soon in California to control postharvest decay of citrus fruit. Isolates from infected lemons and oranges were collected from many geographically diverse locations in California. Thirty-five isolates collected from commercial groves and residential trees were sensitive to TBZ, while 19 of 74 isolates collected from 10 packinghouses were resistant to TBZ. Random amplified polymorphic DNA analysis indicated that the isolates were genetically distinct and differed from each other. Nineteen TBZ-resistant isolates and a known TBZ-resistant isolate displayed a point mutation in the β -tubulin gene sequence corresponding to amino acid codon position 200. Thymine was replaced by adenine (TTC \rightarrow TAC), which changed the phenylalanine (F) to tyrosine (Y). In contrast, for 49 TBZ-sensitive isolates that were sequenced, no mutations at this or any other codon positions were found. All of the isolates of *P. digitatum* resistant to TBZ collected from a geographically diverse sample of California packinghouses appeared to have the same point mutation conferring thiabendazole resistance.