

Title Inhibition of citrus *Penicillium digitatum* with propolis extracts
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Abstract

The antifungal activities of propolis extracts against *Penicillium digitatum*, the major cause of citrus green mold were investigated. The results showed that the inhibitory activities on mycelial growth of *P. digitatum* by solvent propolis extracts with different polarity were in the order of ethyl acetate extract (PEAE) = ethanol extract (PEE) > chloroform extract > petroleum ether extract > water extract, which were consistent with the contents of flavonoids or total phenolics in the corresponding extracts. Further investigation showed that the EC₅₀ and EC₉₀ for PEAE were 76.59 mg/L and 164.85 mg/L, compared to 421.1 mg/L and 3275 mg/L for PEE. The PEAE also showed similar inhibitory effects on spore germination of the pathogen. Morphological observation demonstrated significant decrease in cytoplasmic density with enlarged cytoplasm of hyphae of the fungi treated with PEAE. Furthermore, 0.2% PEAE was effective in controlling the citrus green mold caused by the pathogen after artificial inoculation. Therefore, PEAE holds great potential to control postharvest decays of citrus.