

Title Antifungal activity of eucalyptus-derived phenolics against postharvest pathogens of kiwifruits

Author Oh S.O., Kim J.A., Jeon H.S., Park J.C., Koh Y.J., Hur H. and Hur J.S.

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Abstract

Antifungal activities of natural substances from *Eucalyptus darlympleana*, *E. globules*, *E. gunnii* and *E. unigera* were evaluated against postharvest pathogens of kiwifruits, *Botrytis cinerea*, *Botryosphaeria dothidea*, and *Diaporthe actinidiae*, to screen effective natural substances as an alternative to chemical fungicides. Methanol extract of the Eucalyptus trees showed strong antagonistic activity against the pathogenic fungi. Among them, *E. unigera* and *E. darlympleana* effectively inhibited mycelial growth of the pathogens. For chemical identification of the antifungal substances, the methanol extract of *E. darlympleana* leaves was successively partitioned with CH₂Cl₂, EtOAc, n-BuOH and H₂O. Among the fractions, CH₂Cl₂, and n-BuOH showed strong inhibitory activity of mycelial growth of the fungi. Five compounds were isolated from EtOAc and n-BuOH fractions subjected to SiO₂ column chromatography. Two phenolic compounds (gallic acid and 3,4-dihydroxy-benzoic acid) and three flavonoid compounds (quercetin, quercetin-3-O- α -L-rhamnoside, quercetin-3-O- β -D-glucoside) were identified by ¹H-NMR and ¹³C-NMR spectroscopy. Among them, only gallic acid was found to be effective in mycelial growth and spore germination of *B. cinerea* at relatively high concentrations. The results suggest that gallic acid can be a safer and more acceptable alternative to current synthetic fungicides controlling soft rot decay of kiwifruit during postharvest storage.