

Effects of the peptide H-OOWW-NH₂ and its derived lipopeptide C₁₂-OOWW-NH₂ on controlling of citrus postharvest green mold

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Abstract

The present study evaluated the antifungal properties of tetrapeptide H-OOWW-NH₂ (O₃TR) and its derivative lipopeptide C₁₂-OOWW-NH₂ (C₁₂O₃TR) against *Penicillium digitatum*, one of the main postharvest pathogens in citrus, and the possible mechanisms of their antifungal action. The results showed that the peptides O₃TR and C₁₂O₃TR could inhibit conidial germination, induce conidia death and reduce the survival of mycelia of *P. digitatum in vitro*. The antifungal properties of O₃TR and C₁₂O₃TR against *P. digitatum* were thermostable (40 °C–80 °C), insensitive to the change of pH (3–10) and varying sensitive to the presence of cations (Na⁺, Ca²⁺). In addition, the two peptides could effectively control green mold on citrus *in vivo* study. In terms of safety evaluation, the hemolytic activity of O₃TR was neglectable, and significantly lower than that of C₁₂O₃TR, both of which were much lower than that of commercial prochloraz. The signals and intensity of fluorescent dye SYTOX Green (SG) and Propidium Iodide (PI) showed that O₃TR and C₁₂O₃TR could enhance the mycelial and conidial membrane permeabilization. The antifungal action of O₃TR and C₁₂O₃TR was further demonstrated by the release of cellular constituents and extracellular conductivity. In conclusion, the two peptides have a promising prospect to be applied as antifungal agents for the control of the green mold of citrus postharvest diseases.