

Title Antagonistic substances produced by antifungal strain 34-9 to *Penicillium digitatum*
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Citation Program and Abstracts, 11th International Citrus Congress (ISC Congress), 26-20 October 2008, Wuhan, China. 333 pages.
Keywords green mould; biological control

Abstract

Antifungal strain 34-9 was screened out from citrus orchards, and it was characterized as a strain of *Kloeckera apiculata*. Its *In vitro* test showed strong inhibition activity to *Penicillium italicum* and *P. digitatum*, the main courses of green mold of citrus. The antagonistic substances produced by antifungal strain 34-9 could be extracted by ethylether and ethyl acetate but could not be precipitated by $(\text{NH}_4)_2\text{SO}_4$. The water solvent of ethylether extracts showed good inhibition effect on *P. digitatum*. The antagonistic substance was acidic, could endure the treatment of a wide range of pH (pH 1.0-pH 11.0), had strong heat resistance, and maintained the antifungal activity after the treatment of proteinase K and trypsin. But the inhibition effect was gradually reduced during the storage at 4°C. The antagonistic substances were preliminarily purified by silica gel thin layer chromatography. Active components were obtained at the point where the Rf value was 0.78. The result of qualitative experiments on active components showed that organic acid and hydroxybenzene were involved in the active components; but there was no alkaloid, and anthraquinone. *In vivo*, the control efficiency of antagonistic substances to *P. digitatum* could reach 82%.