

MODE OF ACTION OF *Saccharomyces* sp. AND *Meyerozyma caribbica* INVOLVED IN THE BIOCONTROL OF *Penicillium digitatum*

Authors Ferraz, L.P.¹, Cunha, T.¹, Silva, A.C.², Kupper, K.C.^{3,1}

Institutions ¹UNESP - Universidade Estadual Paulista (Via de Acesso Prof. Paulo Donato Castellane s/n 14884-900 - Jaboticabal, SP), ²UFSCAR – Universidade Federal de São Carlos (Rod Anhanguera km 174 Araras-SP), ³Centro de Citricultura “Sylvio Moreira”/IAC (Rod. Anhanguera km 158, 13490-970 Cordeirópolis-SP)

Abstract:

Green mold, caused by *Penicillium digitatum*, is considered the main postharvest disease of citrus. Chemical treatments, such as the synthetic fungicides Imazalil or Thiabendazole, have customarily been used to control of disease. Environmental and human health concerns as well and the emergence of resistant strains of the pathogen to these chemicals have propelled the search for alternative control measures including biocontrol by yeasts to citrus diseases. However, about the mechanisms involved in the antagonistic activity only few are known. So the present study aimed to evaluate the mode of action of eight strains of yeast (ACBL-76, ACBL-78, ACBL-80, ACBL-81, ACBL-82, ACBL-84, ACBL-86 and ACBL-87) obtained from the phylloplane of citrus plants from different counties of São Paulo that showed potential for biocontrol. The action mechanisms assessed were: production of antifungal compounds (volatile, cell-free and thermostable), nutrient competition, production of hydrolytic enzymes (chitinase and β -1,3-glucanase) and detection of *killer* activity. The results obtained in this study showed that except ACBL-86 and ACBL-87, the other yeast isolates produced antifungal compounds in amounts sufficient to inhibit the growth of *P. digitatum*. ACBL-76, ACBL-81, ACBL-82, and ACBL-84 produced compounds antimicrobial only at high temperatures. The yeast strains were not found to use nutrient competition as a biocontrol strategy. It was observed that five yeasts isolates (ACBL-78, ACBL-81, ACBL-84, ACBL-86 and ACBL-87) showed positives results as the *killer* activity and all yeasts isolates produced chitinase. This work suggests that these modes of action (*killer* toxin production and enzyme activity-chitinase) presented by ACBL-80 (*Saccharomyces* sp.), ACBL-82 (*Saccharomyces* sp.) and ACBL-86 (*Meyerozyma caribbica*), enable these microorganisms are strong candidates for biological control agents of green mold.

Keywords: Hydrolytic enzymes, *killer* activity, green mold, Citrus spp.

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