

Title Control of apple blue mold by the antagonistic yeast *Pichia anomala* strain k: Screening of UV Protectants for preharvest application

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Citation Plant Disease 95(3): 311-316. 2011.

Keywords apple; blue mold

Abstract

When applied preharvest, antagonistic yeasts that act as biocontrol agents of postharvest fruit diseases must survive the environmental conditions in the field. In particular, UV-B radiation (280 to 320 nm) can greatly reduce their survival and effectiveness. The influence of artificial UV-B radiation on *Pichia anomala* strain K, an antagonistic yeast with potential for control of postharvest fruit diseases, was evaluated in vitro and in vivo. The in vitro 50 and 90% lethal dose values were 0.89 and 1.6 KJ/m², respectively, whereas lethal values in vivo were 3.2 and 5.76 KJ/m², respectively. UV protectants tested in combination with strain K included congo red, tryptophan, riboflavin, lignin, casein, gelatine, folic acid, tyrosine, and four mixtures. Riboflavin, folic acid, and the mixtures 1% folic acid + 0.5% tyrosine + 0.5% riboflavin (formula 2), 0.5% folic acid + 1% tyrosine + 0.5% riboflavin (formula 3), and 0.5% folic acid + 0.5% tyrosine + 1% riboflavin (formula 4) reduced yeast mortality caused by UV-B radiation in petri dish assays. Riboflavin, folic acid, gelatine, lignin, and tyrosine reduced yeast mortality caused by UV-B radiation on apple fruit surfaces. With the exception of lignin and folic acid, none of the compounds or mixtures increased significantly the ability of strain K to control the postharvest pathogen *Penicillium expansum* on wounded apple fruit. In contrast, casein, gelatine, tyrosine, congo red, riboflavin, and formulas 1 to 4 significantly reduced the effectiveness of strain K. Further investigations are justified to verify a potential benefit of lignin and folic acid for UV protection of strain K in preharvest applications.