BIOLOGICAL CONTROL OF APPLE BLUE MOLD DISEASE WITH 
*Metschnikowia pulcherrima* ALONE AND IN COMBINATION WITH 
SILICON AND ITS MECHANISMS OF ANTAGONISM*

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Abstract

Biocontrol activity of *Metschnikowia pulcherrima* alone and in combination with silicon against *Penicillium expansum* and its mechanisms of antagonisms was evaluated. Percentage of inhibition mycelial growth of pathogen in dual culture, volatile test and non-volatile test were evaluated. To evaluate the direct effect of silicon on mycelial growth of *P. expansum in vitro*, it was added at different concentrations to PDA medium. The effect of silicon on populations of yeast in NYDB was determined after 24 and 48h. Silicon at 0.6%(wt/vol) or above completely inhibited mycelia growth of pathogen and decreased yeast populations. For determining the effect of *M. pulcherrima* alone and in combination with silicon in controlling disease during storage, fruits were wounded using a sterile nail. Each wound was treated with 20µl of *M. pulcherrima* suspension, solution of silicon in different concentrations, antagonist suspension amended with silicon at different concentrations, and sterile distilled water as the control. After 24h, 20µl of conidia suspension of the pathogen was applied, and fruits were transferred to storage at 4 and 20˚C. At 4˚C and 20˚C after 45 and 15 days, respectively, lesion areas were measured and the population of yeast in the wound was determined by serial dilution. A combination of silicon with yeast reduced the decay of apple better than silicon and yeast alone. Peroxidase activity and total phenolic content were significantly enhanced by yeast treatments.

Keywords: Apple, Biocontrol, Peroxidase, Silicon (Si), Total phenol.

See Persian text for figures and tables (Pages ۵۲۱-۹۲۱).

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