



## Characterization of Biocontrol Activity of Two Yeast Strains from Iran against Blue Mould of Apple in Order to Reduce the Environmental Pollution

Jalal Gholamnejad\*, H.R. Etebarian, N.A. Sahebani, A. Roustaeae

Department of plant protection, Aboraihan Campus, University of Tehran, Iran

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**Abstract:** In this present research, two yeast antagonists *Rhodotorula mucilaginosa* (strain A7) and *Pichia guilliermondii* (strain A6) isolated from the surface of healthy apples, controlled blue mould of apple caused by *Penicillium expansum*. This yeast applied instead of fungicide, whatever hazard health and environment. Both antagonists were evaluated as a potential biological control agent for apple blue mould caused by *P. expansum*. Dual culture, cell free metabolite and volatile test were used *in vitro* assay. Colony area was recorded compared with controls and percentage of growth inhibition was calculated. Both yeast strains of two genus inhibited growth of *P. expansum*, the inhibition varied among isolates of two genuses and ranged from 34.51 to 57.62, in dual culture, from 71.86 to 82.6 in volatile metabolite and from 86.03 to 88.77 in cell free metabolite test. Both antagonists reduced the incidence of blue mould by 70% at 20 °C. At 5 °C *P. guilliermondii* (strain A6) maintained the efficacy of disease control, but *R. mucilaginosa* (strain A7) only reduced disease incidence by 60%. Moreover *P. guilliermondii* (strain A6) exhibited significant protection at lower concentrations than *R. mucilaginosa* (strain A7). The population of both strains increased in wounds of apples at 20 and 5 °C, and both strains maintained viable over a period of 32 days at 5 °C. Separately, effect of CaCl<sub>2</sub> was mixed yeast was evaluated in 25°C. The different of concentration CaCl<sub>2</sub> reduced decay area from 185.07 to 1738.037 mm<sup>2</sup> compared to 2452.84mm<sup>2</sup> in control after incubation for 15 days.

**Keywords:** Biocontrol, Blue mould, Postharvest disease, Dual capture, Volatile and cell free metabolite test, environment

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\*Corresponding: E-mail: jalalgholamnejad2006@gmail.com; Tel: 00983515252254; Fax: 00982923025292