

Title Indole-3-acetic acid improves postharvest biological control of blue mold rot of apple by *Cryptococcus laurentii*

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Abstract

Cryptococcus laurentii is a well-known postharvest biocontrol yeast; however, it cannot provide satisfactory levels of decay control when used alone. Here, we evaluated the effects of indole-3-acetic acid (IAA), a plant growth regulator, on the biocontrol efficacy of the yeast antagonist *C. laurentii* against blue mold rot caused by *Penicillium expansum* in apple fruit. Results showed that the addition of IAA at 20 µg/ml to suspensions of *C. laurentii* greatly enhanced inhibition of mold rot in apple wounds compared with that observed with *C. laurentii* alone. The addition of IAA at 20 µg/ml or lower did not influence the population growth of *C. laurentii* in wounds, but adverse effects were seen on *C. laurentii* when the concentration of IAA was increased to 200 µg/ml or above in vitro and in vivo. *P. expansum* infection in apple wounds was not inhibited when the pathogen was inoculated into the fruit wounds within 2 h after application of IAA; however, infection was reduced when inoculated more than 12 h after IAA application. Treatment of wounds with IAA at 20 µg/ml 24 h before pathogen inoculation resulted in significant inhibition of *P. expansum* spore germination and host infection. Application of IAA at 20 µg/ml also reduced *P. expansum* infection when it was applied 48 h before pathogen inoculation in the intact fruit. Thus, IAA could reinforce the biocontrol efficacy of *C. laurentii* in inhibiting blue mold of apple fruit by induction of the natural resistance of the fruit.