

**Title** Synergistic effect of chitosan and *Cryptococcus laurentii* on inhibition of *Penicillium expansum* infections

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#### **Abstract**

This study was conducted to determine the efficacy of chitosan at different concentrations with various intrinsic viscosities alone, and in its combination with a yeast antagonist *Cryptococcus laurentii* in reducing the blue mold rot caused by *Penicillium expansum* in apple fruit. The results indicated that application of chitosan alone was effective in inhibiting the blue mold rot in apple fruit wounds, especially with the high concentrations and low viscosities. But its efficacy was declining with the incubation time so that chitosan alone could not provide enduring protection of apple fruit from *P. expansum* infections. When applied at the concentration range from 0.001 to 0.1% (wt/vol), chitosan did not influence the population growth of *C. laurentii in vivo*, whereas it markedly repressed the yeast growth as its concentrations were increased up to 0.25% (wt/vol) or higher. Moreover, combination of chitosan and *C. laurentii* resulted in a synergistic inhibition of the blue mold rot, being the most effective at the optimal concentration of 0.1% of chitosan with the lowest viscosity (12 cP). The possible mode of action of the combination of chitosan and *C. laurentii* was discussed.