

Title Some safe treatment for controlling post-harvest diseases of Valencia orange, *Citrus sinensis* L. fruits

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Abstract

Survey of naturally decay orange fruits at local markets from different Governorates in Egypt revealed that green, blue moulds and brown spot caused by *Penicillium digitatum*, *Penicillium italicum* and *Alternaria citri* are the most important disease affecting orange fruits. They caused 56.3%, 25.7% and 12.9% infection of surveyed orange fruits, respectively. All chitosan and citral concentrations used significantly reduced the linear growth and spore germination of three fungi. Complete inhibition was obtained with 6g/l chitosan for *Alternaria citri*, but at 8g/l for *P. digitatum* and *P. italicum*. Citral at 8 ml/l also caused complete inhibition for three tested fungi. Bioagent, i.e. *Bacillus subtilis* and *Pseudomonas fluorescens* caused high reduction in the growth of pathogenic fungi (ranged between 85.5% to 100%). Orange fruits (*Valencia* cv.) coated with chitosan, citral or antagonist bacteria protected the fruits against post-harvest fungi. The most effective concentrations of chitosan and citral were 2%. Chitosan decreased diseases incidence by 14.7%, 11.0% and 8.8% while, citral by 16.2%, 13.0% and 12.6% for *P. digitatum*, *P. italicum* and *A. citri*, respectively as compared with the uncoated fruits after storage for 28 days.