Inhibition of *Botrytis cinerea* and *Penicillium roqueforti* growth by novel galactomannan edible coatings incorporating natamycin

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Fungal pathogens are a major cause of post-harvest spoilage of foods. Botrytis and Penicillium, broad-host-range pathogens, are responsible for substantial economic losses on fruits, vegetables and cheese, causing soft-rotting symptoms. Edible coatings and films can provide an alternative for extending shelf life and improving quality of foods. They can retard surface dehydration, moisture absorption, oxidation of ingredients, aroma loss, ripening/aging, and microbial deterioration of food products. Edible films and coatings may also be used as carriers of functional ingredients such as antimicrobial agents. Recent preliminary works have shown that coatings made of novel galactomannans from Adenanthera pavonina and Gleditsia triacanthos may show potential inhibitory activity over the growth of fungi. This work deals with the determination of the antimicrobial activity of edible films prepared with suspensions of galactomannans from Adenanthera pavonina (1.5 % m/v) containing glycerol (plasticizer) (1.0 % v/v), Gleditsia triacanthos (1.0 % m/v) containing glycerol (2.0 % v/v), both in presence and in the absence of natamycin. Different concentrations of natamycin (0, 5, 10 and 20 µg/mL) were added to the galactomannan coatings to evaluate their efficiency against post-contamination by Penicillium roqueforti and Botrytis cinerea. The effectiveness of the antimicrobial agents (natamycin and/or galactomannans) was evaluated by calculating the total surface contaminated by the fungi over the total surface available for contamination (n = 5). The results obtained showed that natamycin incorporated in galactomannan-based films is active and that the film is a useful barrier to further product contamination. Tukey tests have shown that there are no significant differences between films containing 0 and 5 µg/mL of natamycin but there were significant differences found between 0 and 10 µg/mL, and 0 and 20 µg/mL. During the first 56 hours of growth, an increasing fungal growth rate was observed for decreasing concentrations of natamycin in the coatings.