

Title Evaluation of antimicrobial and physical properties of edible film based on carboxymethyl cellulose containing potassium sorbate on some mycotoxigenic *Aspergillus* species in fresh pistachios

Author Sara Sayanjali, Babak Ghanbarzadeh and Shiva Ghiassifar

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Abstract

Active packaging is a relatively novel concept of packaging that changes the conditions of the packaged food to extend its shelf-life and improve its safety. In this study, antimicrobial effects of carboxymethyl cellulose based-edible film containing potassium sorbate as an antimicrobial agent were studied against *Aspergillus flavus* (PTCC-5004), *Aspergillus parasiticus* (PTCC-5286) and *A. parasiticus* (PTCC-5018) by using agar diffusion assay. Results showed suitable inhibition effects against *A. parasiticus* (PTCC-5286) and *A. flavus* (PTCC-5004) in comparison with *A. parasiticus* (PTCC-5018). Pistachios were coated with this edible antimicrobial film containing three concentrations of sorbate (1, 0.5 and 0.25 g/100 mL film solution); all concentrations showed no growth of molds. Tensile strength values of films with potassium sorbate, decreased when compared to control, and film's flexibility, was 28.82 percent for 3 g/100 mL sorbate, while higher concentration of sorbate, decreased the flexibility. The water vapor permeability values (WVP) of films were determined to be 1.18 (g mm/m² day kPa) for films plasticized with glycerol, without sorbate while WVP values for the films containing 1 and 2 g/100 mL sorbate increased to 3.77 and 15.5 (g mm/m² day kPa), respectively. The observed glass transition temperature (T_g) depression for these polymer blends was related to the plasticizer content (water, polyethylene, and glycerol), especially water.