

عنوان مقاله:

Production and Characterization of Antimicrobial Carboxymethyl Cellulose (CMC) Films Containing Essential Oils of *Satureja khuzistanica*, *Zataria multiflora*, *Allium sativum* and *Bunium persicum*

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خلاصه مقاله:

The aim of this study was to evaluate antimicrobial effects of *Zataria multiflora* Boiss. *Satureja khuzistanica* Jamzad, *Bunium persicum* (Boiss.) B. Fedtsch. and *Allium sativum* L. essential oils and the use of the most effective one in packaging and evaluation of the film properties. The antimicrobial activity against *P. aeruginosa*, *S. aureus*, *E. coli*, *B. cereus*, *S. enteritidis* was studied using the disk diffusion method and MIC and MBC was determined. Then CMC films produced with the addition of *Zataria multiflora* Boiss. And *Satureja khuzistanica* essential oils (1.6%, 2.4%, and 3.2%). The addition of essential oils caused to reduce the moisture content to 16.25% and 17.91%, solubility to 69.01% and 64.78%, the color difference to 21.50 and 12.86 and tensile strength to 54.12 and 29.26 Mpa, respectively. An increase in concentration of *Satureja khuzistanica* essential oil made the film more resistant to water diffusion by 1.05×10^{-13} (g/s m Pa) compared to *Zataria multiflora*. Regarding the possibility of producing the degradable film with antimicrobial essential oils, it is desirable to use these materials to increase food shelf life.

کلمات کلیدی:

Carboxymethyl cellulose, essential oil, *Zataria multiflora*, *Satureja khuzistanica*, Antimicrobial Packaging

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