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عنوان مقاله:

Antibacterial effects of nanochitosan-gelatin film including Cumin Cyminum L essential oil on growth of some bacterial pathogens by disk diffusion method

محل انتشار:

بیستمین کنگره بین المللی میکروب شناسی ایران (سال: 1398)

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خلاصه مقاله:

Introduction and Objectives: The use of biodegradable biopolymer films can cause increase the shelf life of food in industrial packaging. These films via thin layers of different materials on the surface of foods can control microbial hazards. Chitosan, as a cationic polysaccharide, can form gel and Gelatin that is a protein derived from collagen and a gel producer that has a hydrophilic nature and can delay the growth of molds. Also, Cumin Cyminum is one of the most popular spices that has antimicrobial properties in active packaging. Staphylococcus aureus, Listeria monocytogenes, E. coli O157: H7 and vibrio parahaemolyticus are important foodborne pathogens which lead to infectious diseases and dangerous intoxication in humans. So, in this study antibacterial effects of nanochitosan (2%) gelatin(4%) film including Cumin Cyminum L EO(0;0.3;0.6;0.9)% on growth of some bacterial pathogens by disk diffusion method, have investigated. Material and methods: After steam-distillation and GC/MS of Cumin Cyminum EO;and according to protocol of (Sigma-Aldrich), nanochitosan 2% and Gelatin 4% was prepared.So;107 cfu/ml inoculums from each bacterial pathogens cultured on Muller Hinton Agar and done disk diffusion. Result: Analyzing of SPSS software (Version:21-ANOVA) showed the inhibitory effect of gelatin-nanochitosan ,only, with 0.9% E.O on E. coli O157: H7 (ATCC: 18776) (12 ± 1 mm). The inhibitory effect of Listeria monocytogenes (ATCC: 87946) on gelatin-nanochitosan film with different concentrations of E.O indicates a significant difference between each concentrations of EO ($p<0.05$). In the case of Staphylococcus aureus (ATCC: 36454), this inhibitory effect was observed as well as increasing of E.O concentrations.Also, Vibrio parahaemolyticus (ATCC: 43996), in comparison with others has more inhibitory effect by gelatin-nanochitosan, with and without E.O ($p<0.05$). Conclusion: Application of Cumin Cyminum EO(.0.9%)- nano-chitosan -gelatin films inhibit the growth of these bacterial pathogens and have potential to extend .shelf life of food

کلمات کلیدی:

.Nanochitosan, gelatin, Cumin Cyminum EO, film, antimicrobial effects, disk diffusion

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