Antibacterial Effect of Carboxymethyl Cellulose Coating Enriched by Zataria Multiflora Essential Oil and Grape Seed Extract

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Abstract

Background and objectives: The presence of pathogenic bacteria and the factors causing food spoilage are the great challenge for public health. Attention to natural additives instead of chemical preservatives resulted in conducting several studies on plant essential oil and extracts. We aimed at evaluating the antibacterial effect of carboxymethyl cellulose coating enriched by Zataria *multiflora* essential oil and grape seed extract on rainbow trout meat.

Material and methods: In this study, two concentrations of *Zataria multiflora* essential oil (1% and 2%) and two concentrations of grape seed extract (0.5% and 1%) were used both alone and in combination with Carboxymethyl cellulose coating. Antibacterial effect of these treatments was evaluated by enumeration of bacteria in special culture media.

Results: The results obtained in this study demonstrate that *Zataria multiflora* essential oil in combination with grape seed extract significantly can decrease the number of bacteria and delay the spoilage of the samples ($p<0.05$).

Conclusion: Coating enriched by Zataria multiflora and grape seed extract can properly delay the growth of spoilage microorganisms and prolong the shelf life of meat products.

Key words: Carboxymethyl cellulose coating, Zataria multiflora essential oil, Grape seed extract, Microbial flora