



The Effect of Aqueous Extract of Saffron (*Crocus sativus* L. *Stigma*) on the Behavior of *Salmonella* Typhimurium in A Food Model during Storage at Different Temperatures

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ABSTRACT

Background: Given the concerns about the use of chemical preservatives in food, the consumers and producers have been interested in natural alternatives, such as plant essential oils and extracts. Since there are limited studies about the effect of saffron (*Crocus sativus* L.) on the behavior of foodborne pathogens in food models, this study aimed to determine the inhibitory effect of aqueous extract of saffron stigma on the growth behavior of *Salmonella* Typhimurium (*S. Typhimurium*) in commercial barley soup (as a food model) during storage at different temperatures.

Methods: The minimum inhibitory concentration (MIC) and the minimum bactericidal concentration (MBC) of the extract were determined against *S. Typhimurium* using broth microdilution method. The growth of *S. Typhimurium* was investigated in the presence of this extract in commercial barley soup during 12 days of storage at 10, 20, and 30 °C. **Results:** The MIC and MBC values for saffron extract against *S. Typhimurium* were 100 and >200 mg/ml, respectively. Also, the saffron extract at a concentration of 200 mg/ml and temperature of 10 °C had the highest inhibitory effect on the growth of bacteria in commercial barley soup during storage. **Conclusion:** According to the results of this study, the antimicrobial effect of this extract increased in a dose-dependent manner against this bacterium. Therefore, the use of proper concentrations of this extract together with appropriate storage temperature can have an appropriate inhibitory effect on the growth of this bacterium, improving food safety shelf life.

Keywords: Saffron; *Crocus Sativus* L; Antimicrobial; *Salmonella*

Introduction

Various microorganisms, including gram-positive and gram-negative bacteria, as well as fungi, cause a variety of infections in humans.

Over the years, effective antimicrobial substances have been developed to overcome pathogenic microorganisms. However, in recent years,

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