

Study of the Effect of Voltage and PH on the Inactivation of *Byssochlamys fulva* in Tomato Juice by Ohmic Process

Authors : Arash Dara, Mahsa Mokhtari, Nafiseh Zamindar

Abstract : The aim of this study was to determine the effect of thermal resistance, temperature, voltage, and pH changes in an ohmic heating system on reducing the logarithmic number of *Byssochlamys fulva* species (PTCC 5062) in tomato juice water and to investigate the quantitative properties of tomato juice in the ohmic heating pasteurization system. The percentage of thermal degradation by ohmic heating was determined in tomato juice for the kinetics of *Byssochlamys fulva* in ohmic chamber at the temperatures of 88, 93, and 98°C, with two voltages of 30 and 40 volts and two pH levels of 3.5 and 4.5; this was done using Weibull frequency distribution model. Three different parameters (pH = 3.5, two voltages of 30 and 40, at three temperatures 88, 93, and 98) and (pH = 4.5, two voltages 30 and 40, at three temperatures 88, 93, and 98) in three replications were considered in the ohmic system. Heating time for the temperature of 88°C was 20 minutes once every 2 minutes, while for the temperature of 93°C, it was 10 minutes once every 1 minute. At the temperature of 98°C, the first time was 0.5 minutes, and for other times, sampling was done every 1 minute. In each condition, the qualitative characteristics, including acidity, Brix, and pH, were measured before and after the ohmic process in the tomato juice. This study demonstrates that the differences in pH and voltage due to different temperatures in the ohmic process can greatly affect the inactivation of *Byssochlamys fulva* fungus and the qualitative characteristics of the tomato juice. This is the first study using the Weibull frequency method to model the inactivation of *Byssochlamys fulva* in tomato juice. Variation in parameters such as temperature, voltage, and pH can prevent the presence of *Byssochlamys fulva* in the pasteurized juices.

Keywords : pasteurization, ohmic heating process, *Byssochlamys fulva*, tomato juice, heat resistance, voltage, pH

Conference Title : ICFBT 2021 : International Conference on Food Biosciences and Technologies

Conference Location : Cancun, Mexico

Conference Dates : April 05-06, 2021