Inhibitory Effects of Aloe Vera Gel Aqueous Extract and L. casei Against E. coli in Yoghurt

Zahra Nemati Niko1, Peyman Ghajarbeygi2, Razzagh Mahmoudi2*, Shaghayegh Mousavi3, Karim Mardani4

1 Department of Food Hygiene and Safety, School of Health, Qazvin University of Medical Sciences, Qazvin, Iran
2 Health Products Safety Research Center, Qazvin University of Medical Sciences, Qazvin, Iran
3 Microbiology, Department of Health, Qazvin University of Medical Sciences, Qazvin, Iran
4 Department of Food Hygiene and Quality Control, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran

*Correspondence should be addressed to Razzagh Mahmoudi, Health Products Safety Research Center, Qazvin University of Medical Sciences, Qazvin, Iran; Tel: +989127868571; Fax: +989127868571; Email: r.mahmod@yahoo.com.

ABSTRACT

Chemical preservatives are usually used to reduce or eliminate pathogenic or spoilage microorganisms. So many researches have been done to substitute the chemicals with naturally occurring compounds, especially plant essential oils. In this study the growth and survival of E.coli as a pathogen agent were investigated under the synergistic effects of simultaneous presence of Aloe Vera gel aqueous extract and Lactobacillus casei. For this purpose, an amount of 10^8-10^9 cfu/ml of L. casei, 10^3 CFU/ml E.coli, and two different concentrations of Aloe Vera gel aqueous extract (5 and 10%) were added to yoghurt. The samples were kept for 10 days in 4^°C and the survival of E.coli was evaluated. The presence E. coli was determined by culture in selective media and the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of Aloe Vera gel aqueous extract against E.coli was investigated by Micro-well dilution assay. The MIC and MBC values ranged 20% and 40%. The highest antibacterial activity was seen at the end of the storage period and in the samples containing 10% extract (2.33±0.24 log10 cfu/g). E. coli count in samples containing extract and in probiotic yoghurt were significantly decreased in comparison with the control group at the end of storage period. However, there was no significant difference in E. coli count between probiotic and non-probiotic yoghurt containing extract and According to the results of this study L.casei and Aloe vera gel aqueous extract could be used as natural preservative agents in the dairy products.

Key words: Aloe Vera gel, Aqueous extract, Probiotic Yoghurt, E.coli.