



## ORIGINAL ARTICLE

## *Ziziphora clinopodioides* Essential Oil Effects on the Physicochemical and Microbial Characteristics of Cow Milk Butter during the Storage at 4°C

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## KEYWORDS

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**ABSTRACT:** This study was conducted with the aim of investigating the effect of *Ziziphora clinopodioides* on the physicochemical and microbial properties of Iranian traditional cow milk butter. The *Z. clinopodioides* essential oil (EO) was extracted by Cleverger. The EO constituents were analyzed by Gas Chromatography-Mass Spectrometry (GC-MS). Three butter samples with concentrations of 300, 600, and 900 ppm were prepared from the EO. The variation of physicochemical and microbial properties of butter was evaluated on days 1, 3, 5, 7, and 10 at 4°C. Based on GC-MS analysis results, the major EO compounds were Carvacrol (40.1%), Linalool (8.30%), and Isoborneol (4.90%). The results of the microbial evaluation showed that the amount of microbial load is significantly reduced by increasing concentrations of EO and the maintenance time of the butter. The logarithmic reduction of the total count of bacteria, *Escherichia coli*, and the total number of mold and yeast were 3.68, 1.76 and 3.83 (log<sub>10</sub> CFU/mL) at 900 ppm, respectively. The peroxide and acid values of butter samples were also decreased significantly. Additionally, the sensory evaluation showed that the EO had acceptable desirable sensory acceptance at 300, 600, and 900 ppm, and the lowest sensory acceptance was observed at 900 ppm. Considering the antimicrobial and antioxidant effects of *Z. clinopodioides* EO, as well as improving the organoleptic properties of various foods such as butter and its abundance as a native plant in the country, it can be used as a natural preservative and flavoring agent instead of chemical ones.

## INTRODUCTION

Today, the demand for natural products with the lowest processing rate has increasingly grown. One of the challenges ahead of this demand estimation in food industry is the reduction of chemical synthetic

additives in the formulation of food products. In this regard, the use of herbal and natural products has attracted a lot of attentions. Among the natural antimicrobial compounds, essential oils (EO) have a

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