

## عنوان مقاله:

Evaluation of Zataria multiflora Boiss. and Carum copticum L. Essential Oil Based Nanoemulsions in Inhibition of Byssochlamys fulva Growth in Apple Juice

## محل انتشار:

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## خلاصه مقاله:

Byssochlamys fulva is a heat-resistant fungus whose growth causes significant economic losses since it is mostly implicated in the spoilage of processed fruits (e.g., apple juice). Essential oils have received an increasing attention for use in food products to prevent mold growths. In this study, the ultrasonic emulsification method was employed to prepare Zataria multiflora Boiss. Essential Oil (ZEO) and Carum copticum L. Essential Oil (CEO) based NanoEmulsions (NEs) separately using a mixture of components including Z. multiflora and C. copticum oils, each as an organic phase, as well as the surfactant Tween ۸۰ at a ratio of ۱:۴ v/v. The Z. multiflora NanoEmulsion (ZEO-NE) formulated with a droplet diameter of  $19.42 \pm 1.66$  nm and a PolyDispersity Index (PDI) of ۰.۳۷۷ and the Carum copticum NanoEmulsion (CEO-NE) with a droplet diameter of  $15.13 \pm 0.56$  nm and a PDI of ۰.۲۵۳ was found to remain stable for more than ۹ months at ۲۵ °C. The in vitro evaluation revealed that the ZEO-NE at a concentration of ۵  $\mu\text{L mL}^{-1}$  and CEO-NE at ۲۵  $\mu\text{L mL}^{-1}$  gave rise to inhibition effects of  $84.23 \pm 0.006\%$  ( $P < 0.05$ ) and  $86\% \pm 0.012$  ( $P < 0.05$ ) against B. fulva, respectively. The in situ assessment of the nanoemulsions in apple juice revealed a significant ( $P < 0.05$ ) reduction in the inoculated fungal population. Results indicate that the ZEO-NE and CEO-NE can be used as antifungal compounds in beverages.

## کلمات کلیدی:

Antifungal compounds, Polydispersity index, Spoilage molds, Ultrasonic emulsification  
نانوآمولسیون، اسانس آویشن، اسانس زنیان، بایسوکلامیس فولوا، آب سیب

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