

**Title** Application of edible coating based on methylcellulose and *Zataria multiflora* extract for grape (*Vitis vinifera* var. Bidaneh)

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**Citation** Abstracts of 7<sup>th</sup> International Postharvest Symposium 2012 (IPS2012). 25-29 June, 2012. Putra World Trade Centre (PWTC), Kuala Lumpur, Malaysia. 238 pages.

**Keywords** grape; edible coating

### Abstract

The increasing demands for higher chemical quality and environment friendly products have decreased the disposable vessels production and lead to a significant increase in the research in edible coatings. In this paper, the simultaneous effect of coating with methylcellulose and *Zataria multiflora* Boiss extract on the quality of grapes kept in refrigerator has been studied. The methylcellulose was used in 0.1, 0.3, and 0.5 g and *Zataria multiflora* Boiss extract was used in 0, 125, and 250 microlitres. Glycerol was used in preparing coatings with the percentage of 25, 45, and 65 in proportion to the amount of methylcellulose used as plasticizer. After preparation of the different treatments with the aforementioned densities, the coating of grapes was started with the dipping method. Treatments were done in 6±1 degrees centigrade and 70% relative humidity. The grapes were examined every 5 days for 21 days. The examinations included the evaluation of weight loss percentage, TSS, TA, Hardness, color, and appearance. The anti-microbial effect of *Zataria multiflora* Boiss essential oil- used in the grape coating formulation in this study - on *botrytis cinera* (the factor of grey mould of grapes) was evaluated and the minimum inhibitory concentration (MIC) was defined.

After statistical analysis of the findings by response surface methodology (RSM), a decrease in weight loss of the fruit was seen. Fruit consistency and color has not changed during this period. The coating formulations in this study had low effect on TSS and no effect on T A. The results for MIC for 2.5 and 5 percent dilutions of *Zataria multiflora* Boiss essential oil were 45 and 35 microlitres, respectively. From the results, it was concluded that the use of this edible coating leads to increased grape shelf life.