

Effect of Incorporating Selected Herbal Extracts Native of Lebanon on the Chemical Characteristics of Virgin Olive Oil during Static Heating

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Improving the heating characteristics of olive oil is of economic and commercial importance. In this study, the effects of separately adding 18 extracts of plants native of Lebanon (*Helian racemosum*, *Pistacia palaestina*, *Fritaria libanotta*, *Cetarium limbellotum*, *Cistus creticus*, *Scutellaria brevibracteata*, *Verbascum sinwatom*, *Origanum syriacum*, *Thymbra spicata*, *Salvia sclarea*, *Salvia judaica*, *Notobasis syriaca*, *Cytisopsis dorycniifolia*, *Scutellaria heterophylla*, *Aspodelus microcarpus*, *Stachys cretica*, *Orchis papilionacea* and *Ophrys Israelitica*) on the chemical changes of virgin olive oil when subjected to heating were studied and compared to the effects of adding synthetic antioxidants, BHA and BHT. Oil samples with 0.00, 0.04 and 0.08% of the plant extract or synthetic antioxidant were statically heated at three temperatures (160, 180 and $200 \pm 3^{\circ}\text{C}$) and held for 30 min. Free fatty acid (FFA), peroxide value (PV) and iodine value (IV) were determined using AOAC methods. When herbal extracts were added, FFA% reduction compared to the control ranged between 1.5% (*Cistus creticus*) and 49.7% (*Salvia judaica*), with 23.3 and 17.7% when BHA and BHT were added, respectively. In terms of PV reduction, the % ranged between 0% (*Scutellaria brevibracteata*) and 70.7% (*Salvia judaica*), compared to 55.5 and 66.1% when BHA and BHT were added, respectively. In terms of IV increase, the % ranged between 0.4% (*Stachys cretica*) and 15.8% (*Notobasis syriaca*), compared to 4.1 and 4.3% when BHA and BHT were added, respectively. Our results showed that some herbal extracts can outperform the synthetic antioxidants, yet further investigations on their effects on the organoleptic quality of the oil must be performed.