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The Effect of Different Extraction Techniques on the Yield and the Composition of Oil (Laurus Nobilis L.) Fruits Widespread in Syria

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Abstract : Bay laurel (Laurus nobilis L.) is an evergreen of the Laurus genus of the Lauraceae Family. It is a plant native to the southern Mediterranean and widespread in Syria. It is a plant with enormous industrial applications. For instance, they are used as platform chemicals in food, pharmaceutical and cosmetic applications. Herein, we report an efficient extraction of Bay laurel oil from Bay laurel fruits via a comparative investigation of boiled water conventional extraction technique and microwave-assisted extraction (MAE) by microwave heating at atmospheric pressure. In order to optimize the extraction efficiency, we investigated several extraction parameters, such as extraction time and microwave power. In addition, to demonstrate the feasibility of the method, oil obtained under optimal conditions by method (MAE) was compared quantitatively and qualitatively with that obtained by the conventional method. After 1h of microwave-assisted extraction (power of 600W), an oil yield of 9.8% with identified lauric acid content of 22.7%. In comparison, an extended extraction of up to 4h was required to obtain a 9.7% yield of oil extraction with 21.2% of lauric acid content. The change in microwave power impacts the fatty acids profile and also the quality parameters of Laurel Oil. It was found that the profile of fatty acids changed with the power, where the lauric acid content increased from 22.7% at 600W to 30.5% at 1200W owing to a decrease of oleic acid content from 32.8% at 600W to 28.3% at 1200W and linoleic acid content from 22.3% at 600W to 20.6% at 1200W. In addition, we observed a decrease in oil yield from 9.8% at 600W to 5.1% at 1200W. Summarily, the overall results indicated that the extraction of laurel fruit oils could be successfully performed using (MAE) at a short extraction time and lower energy compared with the fixed oil obtained by conventional processes of extraction. Microwave heating exerted more aggressive effects on the oil. Indeed, microwave heating inflicted changes in the fatty acids profile of oil; the most affected fraction was the unsaturated fatty acids, with higher susceptibility to oxidation.

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