

Extraction and Analysis of the Most Important Active Ingredients (Volatile Oil and Polysaccharides) and Determination of its Importance in Medicine, Pharmacy and Nutrition

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Laurus nobilis L. also known as sweet bay, bay laurel, Grecian laurel and bay tree, is either an evergreen shrub or a small tree and belongs to the family of *Lauraceae* comprised of numerous aromatic and medicinal plants. Its height ranges from 6 to 10 meters. It is cultivated in many warm regions of the world, particularly in southern Europe and around the shores of the Mediterranean Sea, including Lebanon. It has been in this country since the ancient times. Lebanese local population uses the fruit in manufacturing but the leaves and fruit's volatile oil, although they have a lot of medical benefits, are underexploited. The dried leaves are mainly used in cooking, and the essential oil is one of the main products from bay trees that are used in food, spice, flavouring and cosmetic industries. Given the scarcity of local studies on Laurel which is widespread in Lebanon, little has been reported to this date. The aim of the present study was to determine and compare leaves, fruits essential oil and the fatty acids of *Laurus nobilis L.* collected from three different geographic and climatic areas. Phytochemical tests on different extracts prepared from dried leaves, using solvents of different polarities such as water, Ethanol, Methanol, Chloroform, Petroleum ether and diethyl ether, determined the concentration of certain constituents like Alkaloids, Flavonoids, Tannins, Anthraquinones and Coumarins. Moreover, additional analytical experiments on samples taken from towns of Kfarnabrakh, Deir-El-Qamar and Semkani determined *Laurus*' composition in trace elements and showed that it was rich in K, Ca and Si. The highest percentages have been found in Deir-El-Qamar. The determination of fatty acids showed a high concentration in stearic, oleic, vaccenic and palmitic acids. Following the phytochemistry, tests were able to extract for the first time many types of polysaccharides such as alginate and fucoidane, confirming their chemical structure by ¹H NMR and IR spectroscopy and determining their effects as antioxidant and anticoagulant agents. Furthermore, we studied the genetic difference between the three samples of *Laurus* by ISSR technique and determined *Laurus* types in Lebanon.

Keywords:

Laurus nobilis L., trace elements, Essential oil, Fatty acids, polysaccharides, Antioxidant, Anticoagulant, Alginate, Fucoidane.