

Tunisian *Salvia officinalis* essential oils: Variations regarding plant organs, harvest season and drying conditions



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Keywords

salvia officinalis

essential oils

hydrodistillation

postharvest treatments

drying

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NWFP

Aromatic & Medicinal Plants

Scale

National



Context

the extracted quantity and quality of Essential oils show important variations. these variations are explained by numerous factors such as the plants from which essential oils are obtained or the postharvest treatments that the plant is subjected to. Analysing these variations is important to optimize essential oil extraction.



Objective

This study presents an assessment of essential oils amounts and quality obtained from Tunisian *Salvia officinalis* and its variations regarding the plant organs, the harvest season and the plant's drying process conditions. Three drying processes were tested, natural air drying, hot air convective drying at two temperature 40 and 60°C and microwave drying at 218 W.



Results

The hydrodistillation using a Clevenger apparatus and a Gas Chromatography coupled to Mass Spectroscopy (GC-MS) were the methods applied to respectively extract and analyze the chemical composition of essential oils. The results showed that *Salvia Officinalis* leaves contained six times more essential oils than the stems. Summer harvesting period was more advantageous than winter and hot air convective drying at temperatures ranging between 40 and 60°C did not affect the essential oils yields compared to microwave drying which leads to important losses of essential oils. The main components found in Tunisian *Salvia Officinalis* essential oils were (alpha) and (Beta) -Thujone, 1,8-Cineole and Camphor.



Recommendations

Getting more information on the effect of the intrinsic properties of the plant, the climatic changes and the post-harvest treatments on the amounts and quality of essential oils is interesting to industrials as well as pharmacists to get the best quality and the largest amounts of essential oils from plants at the lowest possible cost. Thus it is important to conduct experiments to optimize the extraction of essential oils from aromatic and medicinal plants.



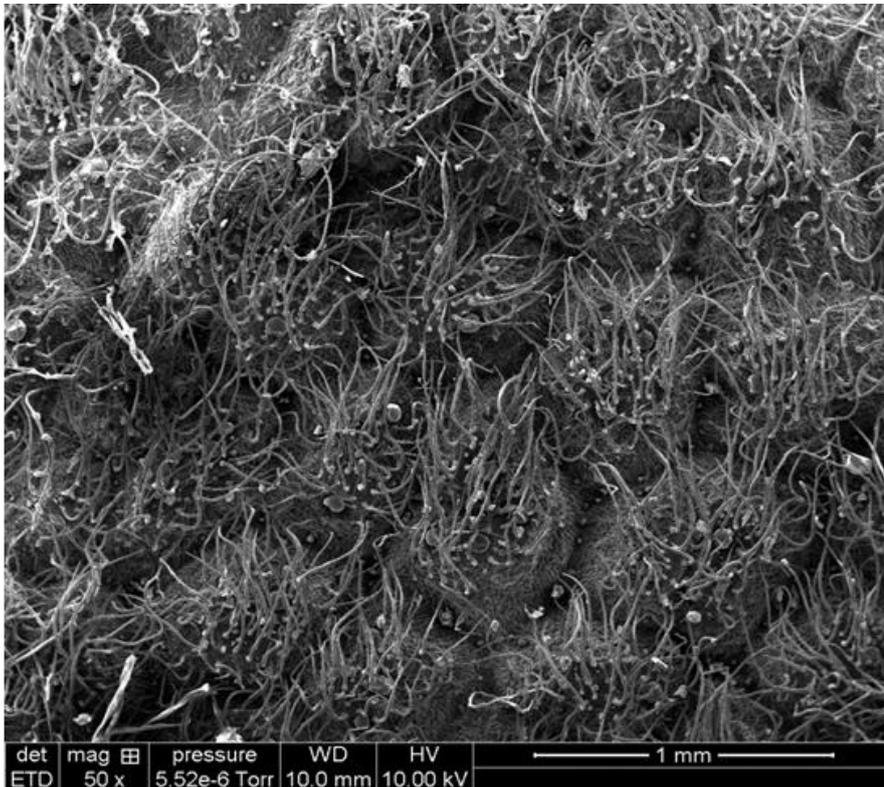
Impacts and weaknesses

Impacts: Understanding the influence of factors such as the intrinsic properties of the plant, the climatic changes and the post-harvest treatments in order to optimize essential oils extraction is likely to be a powerful tool to reduce transport and manufacture costs and some social constraints associated with intensive manual weeding. **Weaknesses:** Drying represents the most energy-consuming operation in aromatic and medicinal plant manufacture



Future developments

The current study succeeded to assess some variations in yields and quality of essential oils of *Salvia Officinalis* related to the plant organ used, the harvesting period, plant storing at ambient air conditions or dried by two different drying processes which are hot air convective drying and microwave drying. However, further investigations have to be considered regarding the biological activities of the essential oils obtained such as antioxidant, antiviral, antibacterial activities etc.



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Further information

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About INCREDIBLE Project

INCREDIBLE project aims to show how Non-Wood Forest Products (NWFP) can play an important role in supporting sustainable forest management and rural development, by creating networks to share and exchange knowledge and expertise. 'Innovation Networks of Cork, Resins and Edibles in the Mediterranean basin' (INCREDIBLE) promotes cross-sectoral collaboration and innovation to highlight the value and potential of NWFPs in the region.



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