شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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EVALUATION OF A NEW MODEL FOR DRYING SOME TYPES OF MEDICINAL AND AROMATIC PLANTS

By

MOHAMED REFAAT ARAFA ABUTALEB

B.Sc.Agric. Sci. (Food Sci. Techn.), Fac. of Agric.,

Ain Shams Univ., 2011

A Thesis Submitted in Partial Fulfillment

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ABSTRACT

Mohamed Refaat Arafa Abutaleb, Evaluation of a New Model for Drying Some Types of Medicinal and Aromatic Plants. Unpublished Master of Agric. Science Thesis, Department of Food Science, Faculty of Agriculture, Ain Shams University, 2021.

Egyptian medicinal and aromatic plants (MAPs) sector suffers from poor drying conditions of the product in terms of quality and safety standards, lack of professional advisory services, in addition to a high undeveloped value chain. Four designs were established in this study and focused on three different methods for plant drying, and the physical properties were measured for each design. The results of the 8/9/2 (B) design of the solar-assisted stack dryer were a masterpiece and promising for drying the selected plants. It was highly effective in reducing the moisture by the rate of (9.6 %) in chamomile, (9.1 %) in both mint, and moringa. The air flow average was 0.79 m/s for the three plants. The results of essential oil extraction in 8/9/2 (B) design of the solar-assisted stack dryer for chamomile and mint showed that the increased yield of essential oil extraction by (30 %) compared with traditional drying methods (control). The results for antimicrobial activity of chamomile oil sample and the quality attributes of the 8/9/2 (B) stack dryer was better than the control, all the dried samples showed optimum color, odor, flavor, taste, and aftertaste values. The drying process caused a sharp decrease in the microbial load for all the dried chamomile, mint, and moringa samples as compared to the control one. The antiviral activity for chamomile oil sample 8/9/2 (B) design generally seemed better, especially with (35.7%) of virus inhibition compared with control which was (14.2%). The study method was promises and distinctive because it increases the drying rate, maintains chemical structure, and it had a high biological effect compared with the control.

Key words: Chamomile, Mint, Moringa, Solar-assisted stack dryer, Biological activity and Sensory evaluation.

DEDICATION

I dedicate my dissertation work to my family and many friends. A special feeling of gratitude to my loving parents, **REEFAT** and **EBTISAM** whose words of encouragement and push for tenacity ring in my ears. My deepest thanks to my wife **ESRAA** for her patience, understanding, encouragement and moral support to give me the chance to complete this work, she never left my side and was very special.

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LIST OF ABBREVIATIONS

MAP	Medicinal and aromatic plants
EOs	Essential oils
Basic Design	Design 1
1/9/2	Design 2
5/5/2	Design 3
8/9/2	Design 4
MDCK	Madin Darby Canine Kidney
DMEM	Dulbecco's Modified Eagle's Medium
FAITC	Food and Agro-Industries Technology Center
FAO	Food and Agriculture Organization
FTRI	Food Technology Research Institute
S	Second
ssp	Subspecies
Str.	*Streptococcus*
TPC	Total Plate Count
TS	Total Solids
P	Pressure
T	Temperature
Q	Air flow
pa	Pascal
V	Air velocity
GC–MS	Gas chromatography–mass spectrometry
ATCC	American Type Culture Collection
TCID50	Median Tissue Culture Infectious Dose
GRAS	Generally Recognized As Safe
FAODA	Fayoum Association for the Development of Organic Agriculture
NGOs	Non-governmental organizations