

**THE EFFECT OF SOME NATURAL OIL EXTRACTS ON
THE MICROBIOLOGICAL LOAD AND QUALITY DEGREE
FOR SOME FOOD STUFFS**

Submitted By

Gad Hassanin Gad Fazaa

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M. Sc. in Environmental Sciences, Institute of Environmental Studies & Research,
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A thesis submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences

Department of Environmental Agricultural Sciences
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APPROVAL SHEET

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LIST OF ABBREVIATIONS

A.L.T	Alanine amino transferase
A.S.T	Aspartate amino transferase
AP	Alkaline phosphates
BHA	Butylated hydroxyl anisole
BHT	Butylated hydroxyl toluene
CEO	Concentration essential oil
EO	Essential oil
ESS	Egyptian Standard Specification
FAO	Food and Drug Administrations
GRAS	Generally Recognized as Safe
HDL	High density lipoprotein
JO	Oil of jojoba
LDL	Low density lipoprotein
MBC	Minimum bactericidal concentration
MIC	Minimum Inhibitory and Bactericidal Concentration
Na OH	Sodium hydroxide
O.	<i>Origanum</i>
S.T.C	Serum total cholesterol
SFE	Steam distillation and supercritical fluid extraction
TBA	Thiobarbituric acid
TBA	Thiobarbituric acid
TEO	Essential oil of thyme
w/w	Weight/ Weight
Wt.	Weight of fatty acid mixture

Abstract

The object of the present study is evaluation of possibility of using cardamom, coriander, marjoram, and rosemary oils mixture as natural antimicrobial in sausage, beef burger ,chicken lentil soup industry to increase the shelf-life of food . The physical and chemical properties of the foods was improved by addition of oils mixture at the concentrations of 600,900 and 1200 ppm to sausage and 200,400ppm before storage at -18°C for 3 months. Such as in sausage the moisture, protein content and carbohydrates were decreased about 1.06, 1.02 and 0.90 fold as compared to zero time, respectively. Whereas, ash, pH value and fat content increased up to 6.19, 18.44, and 6.31%, respectively, as compared to zero time. Improvement has been observed after addition of cardamom and coriander oils mixture and, it works to increase the storage period of the sausage and maintain the stability of the desired qualities for consumers. Regarding to microbial load, samples treated with 900 and 1200 ppm of oils mixture revealed significant reduction after 90 day of storage as compared with the control samples. Sample (1200 ppm) had the highest score for overall acceptable among all investigated samples. Addition of cardamom and coriander oils shows growth inhibition to some types of bacteria and fungi.

Based on this conducted research can be concluded that the addition of functional components in the production is justified, not only to improve the nutritional and biological value, but for the sensory quality that is an important factor to greater demand for these types of food stuffs.

1 - INTRODUCTION

Today's there is a significant consumer demand for foods that are minimally processed and free from synthetic chemical preservatives with the perception of being “natural”. As a result the food industry is facing great challenges to produce naturally occurring food antimicrobials and antioxidants to reduce the use of synthetic chemical preservatives and still produce safe foods that are also regarded as healthy. Also, there are increasing trends to use herbal life style and dietary choices for human welfare and to improve the productivity and health of farm animals these natural products can help the whole body and improve the immunological status (**Zaher *et al.*, 2008**). Spices and herbs are well known for their antimicrobial and antioxidant properties and have the ability to produce multidimensional flavors in food. Aromatic plants have been used traditionally in the therapy of some diseases for a long time. Many plants contain extensive variety of phytochemical compounds with antimicrobial activity (**Azghadi *et al.*, 2010**). The Clove, Cinnamon, Oregano, Rosemary and Dill are considered as the most common spices and herbs with strong antimicrobial activity. Their essential oils containing chemical compounds such as Carvacrol, Cinnamaldhyde, Eugenol and Camphor are identified as the major chemical components responsible for exerting antimicrobial activity (**Weerakkody *et al.*, 2010**). They are used as culinary herb a beverage drink as well as cosmetics. In folk medicine it is used as analgesic, antirheumatict, carminative, diuretic, expectorant, anti-epileptic, anti spasmodic in renal colic, improve human fertility and stimulate hair growth. Also some of this material added as an antioxidant to food (**Hanafy and Sohair 2010**).