



Ain Shams University

Faculty of Specific Education

Home Economic Department

Application of Marjoram (*Origanummarjorana L*) extract and Different Eatract as an Antimicrobial Agent in Sausage

By

NoheerGalal El-Din RashadRagab

Demonstrator of Nutrition and food science Home Economic Department , Faculty of Specific Education, Fayoum University

Thesis

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Supervised by

Prof.Dr. Mohamed NagatiEl.Ghazali .Dr. Usama El- SayedMostafa

Professor of Food Science and AssistantProfessor of Food Science and Nutrition

Nutrition, Dean of Specific Department of Home Economic Faculty of,

Education and Faculty of Tourism & Hotel, Faculty of SpecificEducation,

(Previously), South Valley UniversityAin Shams University

Dr. YasmehFahmyAbd El – Mineem

Lecture of Nutrition and Food Science, Home Economics

Department – Faculty of Specific Eduacation, Fayoum University

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SUMMARY

Marjoram (*Origanum marjorana* L) is a potent source of aromatic having antioxidant, antimicrobial, and antiviral properties. The aim of this study was to investigate these properties possessed by marjoram and benefits in possible food applications. We selected two extracts of (*Origanum marjorana* L) for evaluation against four antibacterial – resistant organisms (*B.cereus*, *E.coli*, *S,entridis* and *Staph, aureus*) and (*Aspergillus* and *Pancellum*). Those pathogens were selected to explore the potential of the selected extracts to prevent the growth of the resistant bacteria.

First: Solid diffusion test (total inhibition (mm)).

A– Total inhibition (mm) for different dilution of ethanol extract.

The antimicrobial effects of some dilution of ethanol extract on the growth of gram positive, gram negative bacteria and fungi were tested. The results illustrated that antimicrobial effect of ethanol extract more potent on gram positive bacteria than gram negative bacteria and fungi. Ethanol extract of marjoram tended to have the highest antimicrobial effect.

B– Total inhibition, (mm) for different dilution of water extract.

The result of uses water extract against some gram negative and gram positive bacteria inhibited that marjoram at different concentrations inhibited all of the tested organisms in most cases,

the antimicrobial activities of the water extract was the highest. Ethanol extract gave a stronger inhibition than the water extract tested in solid diffusion test, gram negative bacteria are generally more resistant than gram positive bacteria.

Second: Microbiological quality of sausage:

A– Commercial Sausage:

All twenty samples of sausage were of satisfactory bacteriological quality. They had total aerobic plate counts (APC) lower than the recommended safety limit. The mean total APC for all sausage analyzed was CFU g⁻¹. No significant difference has been observed between investigated samples ($p < 0.05$).

B– Home-made sausage (Ethanol extract has been added to home made sausage)

1– Bacteriological quality of ethanol extract has been added to sausage examined after storage at different conditions and for various duration of time:

All sausage samples fortified with ethanol examined after storage at refrigerated temperature ($5 \pm 1^{\circ}\text{C}$) and room temperature ($22 \pm 0^{\circ}\text{C}$) for 2,7,14,30 and 60 days were of satisfied bacteriological quality. As expected, with increasing the concentration of ethanol extract the number of APC has been sharply decreasing. The samples of home-made

sausage examined after storage at chill temperature for 7 days was of satisfactory bacteriological quality, providing higher APC than standard home-made sausage that supplemented with a high concentration of ethanol extract (170 ul) tended to have APC much lower than control counterpart.

The current results indicated that all samples of satisfactory fungi quality with the exception control sample had total fungi count higher than recommendation consumable safety limit after storage for equal or more 7 days all examined home-made sausage fortified with high concentration of ethanol extract had the highest total fungi count among all another fortified counterparts.

2- Bacteriological quality of water extract has been added to sausage examined after storage at different conditions and for various duration of time:

All samples of sausage fortified with water extracts were of satisfactory bacteriological quality. It is clear that all water extract samples supplemented with water extract and investigated immediately after making were of satisfactory bacteriological quality it could be safe enough for human consumption . the ethanol extract samples higher inhabitation than water extract samples.

Third: Organoleptic evaluation for sausage:

In the most cases sausage fortified with high concentration of ethanol extract and water extract have the lowest organoleptic

score among all tested ethanol extract and water extract concentrations. All samples of water extract was acceptable more than ethanol extract. In addition, a little difference between control sample and samples fortified by 40,70,100ul of water extract and samples fortified by 40,70 ul of ethanol extract.