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Studies on Some Plants and Gums as Antioxidant and Antimicrobial Activity

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A thesis

Submitted In Partial Fulfillment of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY IN AGRICULTURAL SCIENCES

(FOOD INDUSTRIES)

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2022

Studies on Some Plants and Gums as Antioxidant and Antimicrobial Activity

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ABSTRACT

This study was implied with garden cress seeds flour (GCSF), which has a good medicinal and nutritional properties due to the presence of high levels of crude proteins, phenolics and flavonoids, as well as, garden cress seeds (GCS) gum which has good viscosity properties. So, this study was planned to determine the effect of bleaching process by hydrogen peroxide and purification process by ethanol on garden cress seeds flour and gum properties. In addition, studying the effect of garden cress seeds flour replacement on the quality of wheat and free gluten pan bread properties. Extracted GCS gum (0.1%) and Arabic gum (3%) were used to prepare wheat pan bread. The wheat pan bread samples were prepared by partially replacing the wheat flour by 5, 10, 15, 20 and 30% of GCSF. Also, the free gluten pan bread samples were formed by partially substituting the sorghum flour by 5, 10 and 15% of GCSF. Results showed that H_2O_2 bleaching process decreased viscosity, while increased *L*, *b*, Chroma index and hue values. Results of mixolab noticed that the control sample did not get to the optimum torque of 1.1 Nm at ideal water absorption. The dough tended to slide in the Mixolab bowl and manifested zero torque. Also, results of physical properties of free gluten pan bread samples showed that as replacement of GCSF increased, volume and specific volume were increased. Results of bioactive compounds of wheat pan bread samples showed that replacing of GCSF with addition of Arabic gum increased total phenolic content and radical scavenging activity DPPH %. Free gluten pan bread sample cooled stored with 15% GCSF have no undesirable changes observed up to 11 days compared with the control one 9 days of storage. There was no fungi growth observed for stored cooled wheat pan bread samples with 5, 10 and 15% GCSF with Arabic gum, as well as, stored cooled wheat pan bread sample with 10% GCSF with GCS gum. It is concluded that addition of natural gums as GCS gum and Arabic gum with replacing of garden cress seeds flour improved wheat pan bread samples properties. Possibility of production of free gluten pan bread suitable for gluten allergy patients with improved accepted properties. As well as, hydrogen peroxide is not advised to be used in bleaching garden cress seeds flour and gum.

Key words: Garden Cress Seeds, Garden Cress Seeds Gum, Arabic Gum, Sorghum, wheat pan bread, Free Gluten Pan Bread, Antioxidant Activity and Antimicrobial Activity.

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ABBREVIATIONS

Symbol	Abbreviation Mean
ANOVA	Analysis of variance
BI	Browning index
DMSO	Dimethyl sulphoxide
DPPH	2, 2-diphenyl-1-picrylhydrazyl
GCS	Garden cress seed
GCSF	Garden cress seed flour
H_2O_2	Hydrogen peroxide
B1 - B7	Bacterial isolates
F1 and F2	Fungal isolates
LSD	Least significant difference
NG	No growth observed
RVA	Rapid Visco Analyzer
C1 - C5	Torque points of Mixolab curves
TFC	Total flavonoids content
TPC	Total phenolics content
L	Value that describe lightness (whiteness and brightness)
a	Value that describe the tendency to redness when it is positive (if $a > 0$)
b	Value that describe yellowness