



**TECHNOLOGICAL AND CHEMICAL STUDIES
ON IMPROVING SOME BAKERY PRODUCTS
BY USING NATURAL SOURCES**

By

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THESIS

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ABSTRACT

Chemical, bio-chemical and minerals composition of pomegranate seed pomace (PSP) and the date press powders (DPP) were studied. The results indicated that PSP and DPP is a good source for total dietary fiber, minerals, total phenols, total flavonoids and antioxidant activity. The effect of replacement of wheat flour (72% ext.) with 20, 25 and 30% PSP or DPP on physico-chemical and organoleptic properties of sweet biscuit and salted biscuit were studied. The obtained data show that by increasing the percent of replacement with the previous two sources in the produced biscuits lead to increase of ether extract, ash, crude fiber and mineral contents, while crude protein, available carbohydrates and energy were gradually decreased compared with the control sample. Also, the moisture content and water activity values were increased significantly by increasing the replacement percent with PSP or DPP. During storage period the pH value of biscuit samples was significantly decreased by increasing the replacement percent with PSP or DPP. Also, results revealed that the pH value of all biscuits samples increased with the increase of storage period up to 6 months. At the same time, both of acid value and peroxide value of biscuit samples significantly increased with increasing of storage period up to 6 months. Finally, it could be noted that, sweet and salted biscuits produced by partially replacement of wheat flour with PSP or DPP until level 30% had characterized with a good sensory properties and acceptability. It could be recommended that incorporation of the mentioned raw materials as a food by product to obtain healthy food products (especially bakery products) have a high biological value.

KEYWORDS: Pomegranate seed pomace, date press pomace, biscuits, chemical and physical properties, storage effect.

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LIST OF ABBREVIATION

%	Percentage
AACC	American Association of Cereal Chemists
AOAC	Association of Official Analytical Chemists
ANOVA	Analysis of variance
°C	Centigrade degree
Ca	Calcium
Cm	Centimeter
Co.	Company
DPP	Date press powder
DW	Dry Weight
Ed	Editor
e.g	For example
et al	And others
Ext.	Extraction
FAO	Food and Agriculture Organization
FDA	Food and Drug Administration
Fe	Iron
Fig.	Figure
g	Gram
WF2	Semi hard wheat flour (72% ext.)
i.e	That is
J	Journal
K	Potassium
Kg	kilogram
mg	Milligram
µg	Microgram

Min.	Minute
Na	Sodium
No.	Number
PSP	Pomegranate seeds powder
Sci.	Science
Sec.	Second
WF1	Soft wheat flour (72% ext.)
TPA	Texture Profile Analysis
WHO	World Health Organization
Zn	Zinc
DF	Dietary fibers
TDF	Total dietary fibers
SDF	Soluble dietary fibers
ISDF	Insoluble dietary fibers

1. INTRODUCTION

Agricultural by-products originated from food processing factories represented one of the permanent environmental problems. Nowadays, trends were raised to utilize these valuable wastes full of nutraceuticals and phytochemicals (**Schieber *et al.*, 2001**).

Kumar *et al.*, (2017) declared that huge amount of fruit and vegetable residues by-products from food sector industry increased continuously. **Liu (2004)**, **Kiokias *et al.*, (2016)** and **Varzakas *et al.*, (2016)** pointed to the usefulness of plant residues containing bioactive phytochemicals related to health management, reduced risk of chronic diseases, and could be directed to food-related industries.

Recent studies have shown that pomegranate seeds might be a potential source of antioxidants and nutrients. Furthermore, it has been suggested that food supplementation with pomegranate seeds may prevent DNA damage, reduce the risk of cancer and also reduce the symptoms of menopause. The advantageous of pomegranate seeds are related to the presence of biologically active components especially polyphenols, which their antioxidant effects have been studied. In addition, significant amounts of compounds with polyphenolic structures were detected in pomegranate seeds (**Jing *et al.*, 2012**). Seeds also contain protein, crude fibers, vitamins, minerals, pectin, sugars, polyphenols, isoflavones, the phytoestrogens, coumestrol and the sex steroid estrone (**Aruna *et al.*, 2016**).

Dietary fiber (DF) may be divided into two parts when it is dispersed in water: a soluble and an insoluble fraction (**Perigo *et***