

**PRODUCTION OF SOME NATURAL COLORS FROM
FOOD WASTES AND THEIR APPLICATION
IN SOME FOOD PRODUCTS**

By

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ABSTRACT

Om-Hashem Ahmed Amin Ali: Production of some Natural Colors from Food Wastes and Their Application in some Food Products. Unpublished M.Sc. Thesis, Department of Food Science, Faculty of Agriculture, Ain Shams University 2017.

The present research was carried out to produce some natural food colors from food wastes such as; anthocyanins (red color) from red onion peels (*Allium cepa*), carotenoids (yellow color) from mandarin peels (*Citrus reticulata*) and chlorophylls (green color) from carrot leaves (*Daucus carota L.*), to enhance the appearance of food products and reduce the use of synthetic colors; that harmful to consumers on the long time. The results showed that acidified ethanol and methanol (0.01% Hcl) were the greatest efficient in extracting red onion peel anthocyanins (red color) at low pH (≤ 3.0) followed by distilled water and acidified distilled water(0.01% Hcl) , while the greatest efficient solvents in extracting mandarin peels carotenoids (yellow color) were methanol and ethanol at pH 7.0. On the other hand, methanol and ethanol were the greatest efficient solvent systems to extract carrot leaves chlorophylls (green color) at pH 6.0. Natural extracted carotenoids from mandarin peels were the greatest stabilities at different temperatures(40, 60, 80 and 100°C) for long times up to 120min followed by extracted chlorophylls from carrot leaves, while extracted anthocyanins from red onion peels the lowest stabilities on the same conditions of temperatures and times. Hard candy manufactured by 0.25% of natural red color extracted (anthocyanins) by acidified ethanol and methanol (0.01% Hcl) recorded higher scores of color and overall acceptability compared with synthetic color samples. On the other hand, 0.2, 0.25 and 0.3% level of natural yellow color extracted (carotenoids) from mandarin peels by methanol and ethanol recorded high score of color and overall acceptability compared with synthetic color samples. For instant, hard candy samples manufactured by natural green

color (chlorophylls) by ethanol and methanol at 2.5 and 3.0% levels, respectively recorded higher score of color compared with synthetic color samples. Glazing jelly manufactured by natural red color extracted from red onion peels at 0.25 and 0.3% levels recorded higher scores of color and overall acceptability, respectively compared with synthetic color samples. While added natural yellow color extracted from mandarin peels at 2.0% level recorded high score of color, but added 1.0 and 1.5% levels of natural yellow color recorded higher score of overall acceptability compared with synthetic color samples. On the other hand, added of natural green color extracted from carrot leaves by ethanol and methanol at 1.5 and 2.0% levels, respectively recorded higher scores of color and overall acceptability values, compared with synthetic color samples.

Key words: Food wastes, Natural colors, Artificial colors, Jelly, Hard candy, Confectionery products, Thermal stability, pH, Onion wastes, Citrus wastes, Carrot leaves waste, Anthocyanins, Carotenoids, Chlorophylls.

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LIST OF CONTENTS

	Page
LIST OF TABLES	IV
LIST OF FIGURES	VII
LIST OF ABBREVIATIONS	XI
1. INTRODUCTION	1
2. REVIEW OF LITRATURE	5
2.1. Food processing wastes	5
2.1.1 Anthocyanins	10
2.1.1.1. Sources of anthocyanins	11
2.1.1.2. Extraction of anthocyanins	12
2.1.1.3. Stabilization of anthocyanins	14
2.2.1.4. Application of anthocyanins in food	17
2.1.2. Carotenoids	19
2.1.2.1. Sources of carotenoids	21
2.1.2.2. Extraction of carotenoids	23
2.1.2.3. Stabilization of carotenoids	25
2.1.2.4. Application of carotenoids in food	27
2.1.3. Chlorophylls	28
2.1.3.1. Sources of chlorophylls	30
2.1.3.2. Extraction of chlorophylls	31
2.1.3.3. Stabilization of chlorophylls	33
2.1.3.4. Application of chlorophylls in food	35
3. MATERIALS AND METHODS	36
3.1. MATERIALS	36
3.2. METHODS	36
3.2.1. Preparation of samples	36
3.2.2. Extraction of anthocyanins from red onion peels	36
3.2.2.1. Determination of total anthocyanins	37
3.2.3. Extraction of carotenoids from mandarin peels	38

	Page
3.2.3.1. Determination of total carotenoids	38
3.2.4. Extraction of chlorophylls from carrot leaves	39
3.2.4.1. Determination of total chlorophylls	39
3.2.5. Some properties of extracted natural colors from selected wastes.	41
3.2.5.1. Effect of pH	41
3.2.5.2. Effect of temperatures	41
3.2.5.3. Thermal stability	41
3.2.6. Technological methods	42
3.2.6.1. Hard candy Processing	42
3.2.6.2. Glazing jelly processing	43
3.2.7. Sensory evaluation	44
3.2.8. Statistical analysis	44
4. RESULTS AND DISCUSSION	45
4.1. Anthocyanins	45
4.1.1. Determination of extracted anthocyanins from red onion peels.	45
4.1.2. Some properties of extracted anthocyanins from red onion peels.	48
4.1.2.1. Effect of pH.	48
4.1.2.2. Effect of temperature.	52
4.1.2.3. Thermal stability.	56
4.1.3. Applications of anthocyanins in some food products.	66
4.1.3.1. Hard candy.	66
4.1.3.2. Glazing jelly.	71
4.2. Carotenoids	75
4.2.1. Determination of extracted carotenoids from mandarin peels.	75
4.2.2. Some properties of extracted carotenoids from mandarin peels.	77

	Page
4.2.2.1. Effect of pH.	77
4.2.2.2. Effect of temperature.	80
4.2.2.3. Thermal stability.	84
4.2.3. Applications of carotenoids in some food products.	90
4.2.3.1. Hard candy.	90
4.2.3.2. Glazing jelly.	92
4.3. Chlorophylls	96
4.3.1. Determination of extracted chlorophylls (a and b) from carrot leaves.	96
4.3.2. Some properties of extracted chlorophylls (a and b) from carrot leaves	98
4.3.2.1. Effect of pH.	98
4.3.2.2. Effect of temperature.	102
4.3.2.3. Thermal stability.	106
4.3.3. Applications of chlorophylls (a and b) in some food products.	112
4.3.3.1. Hard candy	112
4.3.3.2. Glazing jelly	115
5. SUMMARY AND CONCLUSION	119
6. REFERENCES	126
ARABIC SUMMARY	

LIST OF TABLES

Table No.		Page
1.	Formulation of control hard candy.	42
2.	Formulation of control glazing jelly.	43
3.	Concentration of extracted anthocyanins (mg/100g) from red onion peels by different solvents.	47
4.	Effect of pH values on retention and degradation rates(%) of extracted anthocyanins from red onion peels by selected solvents.	50
5.	Effect of temperature on extracted anthocyanins from red onion peels by selected solvents at different temperatures for 30 min.	54
6.	Thermal stability of extracted anthocyanins from red onion peels by acidified methanol (0.01% Hcl) at different temperatures and time.	58
7.	Thermal stability of extracted anthocyanins from red onion peels by acidified ethanol (0.01%Hcl) at different temperatures and time.	60
8.	Thermal stability of extracted anthocyanins from red onion peels by acidified distilled water (0.01%Hcl) at different temperatures and time.	62
9.	Thermal stability of extracted anthocyanins from red onion peels by distilled water at different temperatures and time.	64
10.	Sensory evaluations of hard candy prepared with different levels of extracted anthocyanins from red onion peels by selected solvents.	69
11.	Sensory evaluations of glazing jelly prepared with different levels of extracted anthocyanins from red	73

Table No.		Page
	onion peels by selected solvents.	
12.	Concentration of extracted carotenoids (mg/100g) from mandarin peels by different solvents.	76
13.	Effect of pH values on retention and degradation rates (%) of extracted carotenoids from mandarin peels by selected solvents.	78
14.	Effect of temperature on extracted carotenoids from mandarin peels by selected solvents at different temperatures for 30 min.	82
15.	Thermal stability of extracted carotenoids from mandarin peels by methanol at different temperatures and time.	86
16	Thermal stability of extracted carotenoids from mandarin peels by ethanol at different temperatures and time.	88
17.	Sensory evaluations of hard candy prepared with different levels of extracted carotenoids from mandarin peels by selected solvents.	91
18.	Sensory evaluations of glazing jelly prepared with different levels of extracted carotenoids from mandarin peels by selected solvents.	95
19	Concentration of extracted chlorophylls (a and b) (mg/100g) from carrot leaves by different solvents.	97
20	Effect of pH values on retention and degradation rates (%) of extracted chlorophylls (a and b) from carrot leaves by selected solvents.	101
21	Effect of temperature on extracted chlorophylls(a and b) from carrot leaves by selected solvents at different temperaturesfor 30min.	104

Table No.		Page
22	Thermal stability of extracted chlorophylls (a and b) from carrot leaves by ethanol at different temperatures and time.	108
23	Thermal stability of extracted chlorophylls (a and b) from carrot leaves by methanol at different temperatures and time.	110
24	Sensory evaluations of hard candy prepared with different levels of extracted chlorophylls (a and b) from carrot leaves by selected solvents.	114
25	Sensory evaluations of glazing jelly prepared with different levels of extracted chlorophylls (a and b) from carrot leaves by selected solvents.	117

LIST OF FIGURES

Fig. No.		Page
1.	Concentration of extracted anthocyanins (mg/100g) from red onion peels by different solvents.	47
2.	The retention rates (%) of extracted anthocyanins from red onion peel by selected solvents at various pH values.	51
3.	The degradation rates (%) of extracted anthocyanins from red onion peel by selected solvents at various pH values.	51
4.	Effect of different temperatures on extracted anthocyanins from red onion peel by selected solvents for 30 min.	55
5.	Thermal stability of extracted anthocyanins from red onion peels by acidified methanol (0.01%Hcl) at different temperatures and time.	59
6.	Thermal stability of extracted anthocyanins from red onion peels by acidified ethanol (0.01%Hcl) at different temperatures and time.	61
7.	Thermal stability of extracted anthocyanins from red onion peels by acidified distilled water (0.01%Hcl) at different temperatures and time.	63
8.	Thermal stability of extracted anthocyanins from red onion peels by distilled water at different temperatures and time.	65
9.	Hard candy prepared with different levels of extracted anthocyanins from red onion peel by selected solvents.	70
10.	Glazing jelly prepared with different levels of extracted anthocyanins from red onion peel by selected solvents.	74

Fig. No.	Page
11. Concentration of extracted carotenoids (mg/100g) from mandarin peels by different solvents.	76
12. The retention rates (%) of extracted carotenoids from mandarin peel by selected solvents at various pH values.	79
13. The degradation rates (%) of extracted carotenoids from mandarin peel by selected solvents at various pH values.	79
14. Effect of different temperatures on extracted carotenoids from mandarin peels by selected solvents for 30 min.	83
15. Thermal stability of extracted carotenoids from mandarin peels by methanol at different temperatures and time.	87
16. Thermal stability of extracted carotenoids from mandarin peels by ethanol at different temperatures and time.	89
17. Hard candy prepared with different levels of extracted carotenoids from mandarin peel by selected solvents.	92
18. Glazing jelly prepared with different levels of extracted carotenoids from mandarin peel by selected solvents.	96
19. Concentration of extracted chlorophylls (a and b) (mg/100g) from carrot leaves by different solvents.	98
20. The retention rates (%) of extracted chlorophylls (a and b) from carrot leaves by selected solvents at various pH values.	101
21. The degradation rates (%) of extracted chlorophylls	102

Fig. No.		Page
	(a and b) from carrot leaves by selected solvents at various pH values.	
22.	Effect of different temperatures on extracted chlorophylls (a and b) from carrot leaves by selected solvents for 30 min.	105
23.	Thermal stability of extracted chlorophylls (a and b) by ethanol from carrot leaves at different temperatures and time.	109
24.	Thermal stability of extracted chlorophylls (a and b) by methanol from carrot leaves at different temperatures and time.	111
25.	Hard candy prepared with different levels of extracted chlorophylls (a and b) from carrot leaves by selected solvents.	115
26.	Glazing jelly prepared with different levels of extracted chlorophylls (a and b) from carrot leaves by selected solvents.	118