J. Agric. Sci. Mansoura Univ., 34 (6): 6311 - 6320, 2009

UTILIZATION OF SOME VEGETABLES LEAVES IN PROCESSING SOME TRADITIONAL FOOD (MAHSHY)

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ABSTRACT

The stuffed vegetables leaves were performed as a traditional food in the present study. Berry, chard, grape, lettuce, turnip and mallow leaves were chosen to prepare the stuffed. Chemical composition, some macro and micro-nutrients, total phenol and antioxidant activity were determined to distinct the nutritional and healthy values of stuffed vegetables leaves. It was found that high values of protein were achieved in stuffed grape leaves. While the highest fat was realized in stuffed turnip leaves. The stuffed berry leaves had the maximum scores for appearance, texture, odour, taste and colour and followed by stuffed lettuce leaves. The highest phosphorus content was achieved by stuffed grape leaves and followed by stuffed mallow leaves. The highest concentrations of potassium, calcium, iron and zinc were realized by stuffed berry leaves. The highest values of vitamin A, and Niacin were occurred in stuffed grape leaves. The highest one of vitamin C was achieved by stuffed mallow leaves. While, stuffed turnip leaves contained high levels of vitamin B6 and vitamin E. the stuffed berry leaves contained the highest value of riboflavin and thiamin.

The maximum value of total phenols were occurred in berry leaves followed by turnip leaves. The highest value of antioxidant activity was achieved by grape leaves followed by both lettuce and mallow leaves. The maximum values of chlorophyl A and B were realized by grape leaves. However, berry leaves had the high levles of chlorophyl A and caroteins.

INTRODUCTION

Vegetables constitute a food source for carbohydrates, vitamins, minerals and fibers with low fats and proteins contents. Leafy vegetables in particular are a rich source of beta-carotene, ascorbic acid, minerals and fibers (Arthey and Dennis, 1992, Negi and Roy, 2001).

Oxidation processes are very important for living organism. The uncontrolled production of oxygen free radicals and the unbalanced mechanism of antioxidant protection result in the onset of many diseases and accelerate ageing. Antioxidants are considered as possible protection agents reducing oxidative damage of human body. Therefore, there is a growing interest in the substances exhibiting antioxidant properties that are supplied to human and animal organisms as food components or as specific pharmaceutics. Recently, natural antioxidants have become one of the major areas of scientific research (Demo, *et al*., 1998; Sanchez-Moreno, *et al.,* 1999). The plant kingdom offers a wide range of natural antioxidants. However, little is known about the practical usefulness of most of them. Many herbal and plant infusions frequently used in domestic medicine have antioxidative and pharmacological properties connected with the presence of phenolic compounds, especially flavonoids. Flavonoids very easily take part in oxidation-reduction processes, both inside and outside cells. The

antioxidant power of flavonoids relies on their ability to interact with free radicals which initiate oxidation reactions or which are produced during chain reactions, on the inhibition of oxidation processes, which the activity of oxidase enzymes, or on the complexation of transition metals ions which catalyse oxidation reactions (Shahidi and Wannasundara, 1992; Jovanovic, Steenken, *et al.*, 1994; Vinson, *et al.*, 1995; Rice-Evans, *et al*., 1996; Brawn, *et al*., 1998; Paganga, *et al.*, 1999). In addition to their free radical scavenging property, flavonoids are reported to have multiple biological effects including anticarcinognic, antiinflommatory, antibacterial, immune-stimulating, antiallergic and antivirial as well as tightening blood capillaries(Messina, *et al.*, 1997; Demo et al., 1998). However, it is the leaves of the plant, its main biomass, that should be considered as an important source of flavonids. Hence, the antioxidant effectiveness of leaves extracts is particularly worth examining.

Phenolic content of berry plant leaves was undertaken by Skupien et al.(2006). It was found that the highest total phenolic content was noticed in raspberry leaves and the lowest in blueberry leaves. The main substance present in blueberry leaf extract was caffeic acid (60.4% of all polyphenols). The blueberry extract had only 5.3% of ellagic acid content compared to that of the raspberry extract.

The nutritional status of berry and grape leaves was evaluated by Navarro et al. (2008). Nitrogen, phosphorus and potassium decreased throughout a seasonal cycle, whereas calcium content increased as a result of the leaf aging process. All these results suggested that the decrease in N, P and K is mainly due to the re-translocation of these mobile macro-elements to different sink organs, like fruits that grow during this period. Calcium concentrations in the leaves increased throughout the sampling period, due to the low mobility of this macro element in phloem and its high availability in the soils where the studied grape vines were grown.

The composition of the essential oils isolated from leaves and berries of Juniperus ravicularis Gand , an endemic species from Portugal were investigated by Cavaleiro et al.(2003). The oils consisted mainly of monoterpene hydrocarbons ((67.1 and 88.0% for leaf and berry oils, respectively). α- Pinene(6.3-38.0%), Limonene (7.0-34.6%), α- phellandrene (2.2-13.1%) and p-cymene (4.8-10.3%) were the major constituents of the oils from leaves and β- myrcene (25%) and α-pinene (24.4%) the major ones of the oil from berries.

The average composition of turnip leaves was protein (2.7%), fiber (3.9%), carbohydrate (0.1%), calcium (0.1%), magnesium (0.01%), sodium (0.01%), Potassium (0.08%), phosphorus (0.04), vitamin C(0.04) and vitamin E (2mg/100g) (Mataix et al., 1998).

Turnip vegetables are supercharaged with so many different nutrients, their consumption can help prevent or heal a wide range of health conditions. Since turnip greens are an excellent source of vitamin A (through their concentration of carotenoids such as beta-carotene), vitamin C, vitamin E, vitamin B6, folate, copper, calcium and dietary fiber. Turnip greens also serve as an excellent source of calcium and higher intakes of this important mineral have been associated with a significant decrease in the riske of colon

and rnectal cancer. The excellent dietary fiber content of turnip greens adds yet another plus in their ability to provide potential protection ageinst colorectal cancer (Baybutt and Molteni, (2000) and Jarvik et al.(2002).

Vegetarians or those consuming vegetables as a major adible portion of their daily foods, along with consuming fewer calories from saturated fat and animal products, are at a lower risk of coronary heart disease and cancer (Kahlon et al.(2007).

USDA Food and Nutr. Inform.Center (2005) recommends daily active life, intake of low fat food products and consumption of dark, leafy and colorful vegetables.

Vegetables are considered as good source of dietary fiber, phytonutrients, provitamins, anti oxidants, polyphenols and minerals, prebiotics and immune protecting phytochemicals (Kahlon et al.(2007).

The consumption of dried vegetables soup mad of mallow, cauliflower and squask led to reduce serum lipids profile, prevention of adipose tissue and controlling weight (Bakry et al.(2007).

This work was undertaken to asses utilization of some plant leaves in processing some traditional food.

MATERIALS AND METHODS

Materials:

Row material:

Berry (*Sambucus nigra* L.), chard (*Beta vulagris*), grape (*Vitis uinifera* L.), lettuce (*lactuc sativa*), Turnip (*Brassica rapa*) and mallow leaves (*Malva pariflora*) were obtained from local market in Giza.

Stuffed preparation:

These vegetable leaves were soaked in the warming water. After cooling, the leaves were rolled with mixture rice recorded in Table (1), then water was added to the stuffed leaves with percent 1:1 to cook it. It was noticed that the percent of vegetables leaves to mixture rice was equaled to 17%.

Chemical analysis:

1. Energy, moisture, fat protein dietary fiber, carbohydrates, vitamins, phosphorus, potassium, calcium, magnesium, sodium, iron, manganese and zinc were determined from the collected data in FIAS (1998).
2. Chlorophyll content (A and B) was determined according to the method described by (Arnon,1949).
3. **Total phenol:** Total phenolics were determined using Folin-Ciocalteu reagent (Singleton and Slinkard, 1977).
4. **Antioxidant activity:** The antioxidant activity was determined using the DPPH free radical scavenging method as described by Fernandes et al. (2007).
5. **Organoleptic evaluation:** the organoleptic characteristics of the stuffed vegetable leaves were estimated according to Larmond (1970).

Ten panelists were asked to evaluate appearance, texture, odour , taste and colour using score of 10 for each character. The average score for

each character was calculated.

Statistical analysis:

Organoleptic score were statistically analysis according to the methods described by Snedecor and Cochran(1984)

Table (1): The mixture rice using in stuffing vegetable leaved

No.	Constituent	Weight
1	3 onions	300 g
2	10 clove of garlic	15 g
4	Carrots	330 g
5	2 parcels of parsley raw	150 g
6	3-parcels of dill raw	225 g
7	Coriander raw	225 g
8	3 pods of green pepper	110 g
9	1.5 big spoon of salt	70 g
10	1.0 small spoon of black pepper	5.0 0g
11	1.5 small spoon of cumin	7.5 0g
12	1.0 cloves of cardamon	5.00g
13	0.5 small spoon of thyme	2.50 g
15	0.5 small spoon of marjoram	2.50g
16	2.0 spoon of vinegar	15.00 g
17	Sunflower oil	200 g
18	Tomatoes	1.50 kg
19	Rice	1.00 kg

RESULTS AND DISCUSSION

Chemical composition of some vegetables leave, stuffed and mixture rice:

The chemical composition of berry, chard, grapes, lettuce, mallow, turnip leaves, stuffed and mixture rice are shown in Table (2). It could be seen that the highest content of protein was found in stuffed grape leave (3.99%) and followed by stuffed berry leaves (3.94%). This is attributed to high values of protein were found in raw materials. However, the lowest one was achieved by turnip leave raw (0.90 %). The maximum value of fat resulted in berry leave raw (2.94%) and followed by grape leave raw (2.12%). Whereas the lowest one was recorded by turnip leave raw (0.10%). On the other hand, the highest value of bat was achieved by stuffed turnip leaves (5.23%).But; lettuce leave contained the lowest one (0.53%).

Also, data in Table (2) show that the maximum value of dietary fiber was recorded by stuffed berry leave (5.72). This is due to high value of dietary fiber resulted in berry leave raw (22.82%). Meanwhile, the lowest one was obtained by stuffed lettuce leaves.

Data in Table (2) appeared that highest carbohydrate content was accurred in stuffed grape leave (28.91%) followed by stuffed mallow leave (27.00%). This may be ascribed to high values of carbohydrate achieved in both grape and mallow leaves raw. It was noticed that the carbohydrate content of stuffed plant leave was higher than achieved in plant leave raw. This increment may be due to the obtained data revealed that eating stuffed vegetable leaves (100g) provide the body with energy ranged from 120.9 to

161.0 k.cal. It could be recommended to eat stuffed leaves without any risk for obesity because of its low calory. The highest energy was in stuffed turnip leave (161.03 k cal/100g) and followed by stuffed grape leave (135.43 k cal/100g).

Table (2): Chemical composition of some vegetables, stuffed and rice mixture (Per 100 g sample)

Constituents kind	Energy k.cal	Moisture	Protein (g)	Carbohydrate (g)	Fat (g)	Dietary (g) fiber
Berry leave raw	74.00	43.26	5.32	6.54	2.94	22.82
Stuffed berry leave	131.39	63.05	3.94	26.93	1.71	5.72
Chard leave raw	19.00	92.66	1.80	3.74	0.20	1.60
Stuffed chard leave	122.21	66.76	3.32	26.49	0.53	2.12
grape leave raw	93.00	73.32	5.60	17.30	2.12	11.00
Stuffed grape leave	135.43	63.30	3.99	28.91	0.88	3.80
Lettuce leave raw	12.00	95.89	1.01	2.09	0.19	1.40
Stuffed lettuce leave	120.96	67.33	3.17	26.19	0.53	2.09
Mallow leave raw	36.00	86.30	4.80	6.60	0.20	1.50
Stuffed mallow leave	125.25	65.62	3.85	27.00	0.53	2.12
Turnip leave raw	27.00	91.87	0.90	6.23	0.10	1.80
Stuffed turnip leave	161.03	92.84	3.29	26.00	5.23	2.43
Rice mixture	113.01	69.63	2.85	24.56	0.47	1.75

Some macro and micro-nutrients of vegetables leaves, stuffed and rice mixture:

Data presented in Table (3) show that the highest phosphorus content was achieved in grape leave raw (91mg/100g) followed by mallow leave raw (67mg/100g). Consequently, the maximum phosphorus content was occurred in stuffed grape leaves (68.15mg/100g) followed by stuffed mallow leaves (63.86mg/100g),

Table (3): Some macro and micro-nutrients of vegetables, stuffed and rice mixture (mg/100 g).

Constituents kind	Phosphorus mg	Potassium mg	Calcium mg	Magnesium mg	Sodium mg	Iron mg	Zinc mg	Copper mg
Berry leave raw	24.00	433.40	1118.50	338.01	0.01	36.85	5.04	0.00
Stuffed berry leave	51.89	310.32	239.78	81.11	732.50	7.90	1.40	0.14
Chard leave raw	46.00	379.00	51.00	81.00	213.00	1.80	0.36	0.18
Stuffed chard leave	60.11	300.60	48.99	35.17	770.57	1.63	0.56	0.17
grape leave raw	91.00	272.00	363.00	95.00	9.00	2.63	0.67	0.42
Stuffed grape leave	68.15	281.47	104.76	37.67	734.11	1.78	0.61	0.21
Lettuce leave raw	20.00	158.00	19.00	9.00	9.00	0.50	0.22	0.03
Stuffed lettuce leave	55.46	261.10	43.28	22.30	734.11	1.40	0.53	0.14
Mallow leave raw	67.00	296.00	324.00	104.00	48.00	4.50	3.60	0.12
Stuffed mallow leave	63.86	285.76	97.79	39.28	741.08	2.12	1.14	0.16
Turnip leave raw	27.00	191.00	30.00	11.00	67.00	0.30	0.27	0.09
Stuffed turnip leave	60.99	269.57	72.81	24.21	661.38	1.46	0.54	0.18
Rice mixture	51.95	233.16	37.93	19.69	696.76	1.31	0.47	0.14

Also, the results in Table (3) showed that, the optimum concentrations of potassium, calcium, iron and zinc were realized by stuffed

berry leaves. The results in Table (3) display also that both stuffed grape leaves and stuffed mallow leaves contained high values of potassium, calcium, iron and zinc. However, the minimum values of these nutrients were achieved by stuffed lettuce leaves. Theses results are in conformity with Navarro et al.(2008).

Some vitamins content of vegetables leaves, stuffed and rice mixture:

Data in Table (4) cleared that the optimum values of vitamin A and Niacin were achieved in stuffed grape leave. While, the stuffed berry leaves contained the highest values of riboflavin and thiamin. On the other hand, the high vitamin B6 and vitamin E levels were occurred in stuffed turnip leaves followed by stuffed grape leave. Stuffed leaves mallow contained highest values of vitamin C. These results are in accordance with Baybutt and Molteni (2000) and Jarvik et al.(2002)

Table (4): Some vitamins content of vegetables stuffed and rice mixture

Constituents kind	Vitamin A IU	Thiamin MG	Riboflavin Mg	Niacuin MG	Vitamin B6-MG	Folate MC G	Vitamin C-MG	Vitamin E-AE
Berry leave raw	1829.90	0.26	0.61	0.00	0.00	0.00	13.84	0.00
Stuffed leave raw	3257.05	0.11	0.18	0.97	0.12	14.87	16.64	0.55
Chard leave raw	3300.00	0.04	0.09	0.40	0.10	13.80	30.00	1.89
Stuffed leave raw	3506.25	0.07	0.10	1.04	0.14	16.72	18.05	0.89
grape leave raw	26993.0	0.04	0.35	2.36	0.40	83.00	11.10	2.00
Stuffed leave raw	7528.94	0.07	0.15	1.37	0.19	25.99	15.68	0.91
Lettuce leave raw	330.00	0.05	0.03	0.18	0.04	56.00	3.90	0.28
Stuffed leave raw	3001.99	0.08	0.09	1.00	0.13	22.37	14.78	0.60
Mallow leave raw	5600.00	0.12	0.16	0.00	0.00	0.00	34.00	0.00
Stuffed leave raw	4049.56	0.09	0.11	0.97	0.12	14.87	18.55	0.55
Turnip leave raw	5494.48	0.04	0.03	0.40	0.09	14.50	21.00	0.03
Stuffed leave raw	3572.54	0.08	0.09	0.99	0.22	29.42	17.82	3.18
Mixture rice	2949.72	0.08	0.09	0.83	0.12	20.20	17.00	0.53

Total phenols (mg/gm) and antioxidant activity (%) in some vegetables leaves:

Data in Table (5) reveal that total phenols content in chard, lettuce, berry, grape, mallow and turnip leaves. It was noticed that the maximum value of total phenols were occurred in berry leaves followed by turnip leaves. While, the lowest one was found in chard leaves.

Table (5): Total phenols (mg/gm) and antioxidant property (%) in some vegetables leaves

Samples leaves	25 µ mol	50 µ mol	100 µ mol	Total phenol mg/gm galic acid
Chard	4.51	17.66	20.70	25.17
Lettuce	11.52	53.60	57.10	27.52
Berry	2.57	10.52	47.81	51.85
grape	6.30	39.32	66.19	38.08
Mallow	30.90	36.41	57.10	39.75
Turnip	12.99	29.19	32.93	46.12

The results in Table (5) also display antioxidant activity determined in chard, leuttace, berry, grape, mallow and turnip leaves for 25, 50 and 100µ

mol concentrations. It could be found that antioxidant values gradually increased whereas the concentration intensified from 25 µ mol. The highest value of antioxidant property was achieved by grape leaves and followed by either leuttace or mallow leaves. This proves that each of grape, leuttace and mallow leaves had the high antioxidant power of flavonoids. The antioxidant power of flavonoids relies on their ability to interact with free radicals which initiate oxidation reactions or which are produced during chain reactions, on the inhibition of oxidation processes, which diminishes the activity of oxidase enzymes, or on the complexation of transition metal ions which catalyse oxidation reactions (Rice-Evans et al, 1996; Brown et al., 1998 and Paganga et al., 1999). Although, the minimum value of antioxidant property was resulted in chard leaves.

Chlorophyll A, B and Caroteins(%) in some vegetables leaves:

The results in Table (6) show that chlorophyll A, B and Caroteins (%) in chard, leuttace, berry, grape, mallow and turnip leaves. The maximum value of chlorophyll A was occurred in grape leaves and followed by berry leaves. But, mallow leaves gave the lowest one. On concern chlorophyll B, the highest value of chlorophyll B was achieved in grape leaves followed by turnip leaves. However, the minimum value of chlorophyll B was realized in leuttace leaves.

Table (6): Chlorophyll A, B and Caroteins (%) in some vegetables leaves

Samples leaves	Chlorophyll A %	Chlorophyll B %	Caroteins %
Chard	0.13	0.15	0.02
Lettuce	0.13	0.13	0.02
Berry	0.14	0.18	0.08
grape	0.16	0.26	0.03
Mallow	0.11	0.21	0.00
Turnip	0.12	0.22	0.01

Regarding, caroteins percent in the studied vegetables leaves, berry leaves resulted the maximum value of caroteins percent and followed by grape leaves. Meanwhile the minimum one was occurred in mallow leaves.

Organoleptic scores of some kinds of stuffed:

Appearance, texture, odour, taste and colour of some kinds of stuffed were evaluated organoleptically, Table (7). It could be noticed that stuffed berry leaves had the highest scores for appearance, texture, odour, taste and colour ($P \leq 0.05$) as compared with other stuffed kinds and followed by stuffed lettuce leaves.

Table (7): Organoleptic scores of some kinds of stuffed

Stuffed kind	Appearance	Texture	Odour	Taste	colour
Berry	8.70^{a}	8.50^{a}	8.60^{a}	8.60^{a}	8.70^{a}
Chard	7.40^{b}	6.70^{b}	7.00^{b}	6.90^{b}	7.40^{b}
Grape	7.20^{b}	7.00^{b}	6.80^{b}	7.00^{b}	7.10^{b}
Lettuce	7.70^{b}	7.60^{ab}	7.10^{b}	7.40^{b}	7.20^{b}
Turnip	7.0^{b}	6.70^{b}	6.70^{b}	6.80^{b}	7.30^{b}
Mallow	7.20^{b}	7.30^{b}	6.70^{b}	6.80^{b}	7.40^{b}
L.S.D.0.05	0.26	0.25	0.24	0.26	0.22

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الاستفادة من بعض أوراق الخضروات فى اعداد بعض الوجبات التقليدية(محشى)

هاله محمد ذكى على ، نادية طه صالح وامانى عبد الفتاح سالم
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لقد استخدم بعض اوراق الخضروات غير التقليدية نظرا لقيمتها الغذائية والصحية فى اعداد وجبة شعبية)المحشى (وهذة الاوراق تشمل أوراق التوت، السلق، العنب ، الخس، اللفت والخبيزة ، وقدركل من التركيب الكيماوى، بعض العناصر الكبرى والصغرى، الفينول الكلى ومضادات الاكسدة للتعرف على القيمة الغذائية لمحشى هذه الخضروات .وكان أهم النتائج المتحصل عليها :

ان محشى ورق العنب كان له أعلى محتوى من البروتين بينما كان لمحشى ورق اللفت أعلى محتوى من الدهون.وحصل محشى ورق التوت فى الاختبارات الحسية على أعلى درجات من حيث المظهر، القوام، الطعم، الرائحة، اللون وتلاه فى هذه الدرجات محشى ورق الخس

وأعلى تركيز من الفوسفور وجد فى محشى ورق العنب يليه محشى ورق الخبيزه بينما احتوى محشى ورق التوت على أعلى تركيز من البوتاسيوم والكالسيوم، الحديد، الزنك .كما وجد أن محشى ورق العنب يحتوى على القيم المثلى لكل من فيتامين أ، النياسين .احتوى محشى الخبيزة على أعلى قيم من فيتامين ج واحتوى محشى ورق اللفت على مستويات عالية من فيتامين ب $_6$، فيتامين E .واحتوى محشى ورق التوت على أعلى قيمة من الثيامين والريبوفلافين .كما احتوى ورق التوت على أقصى قيمة من الفينولات وكان ورق اللفت هو الذى يليه فى هذا المحتوى .وأعلى قيمة لمضادات الاكسدة كانت ناتجة عن ورق العنب وتلاه فى ذلك كل من ورق الخس، وورق الخبيزة . واحتوى ورق العنب على أقصى قيمة من الكلوروفيل A,B.بينما احتوى ورق التوت على مستويات عالية من كل من الكلوروفيل A، الكاروتين.