سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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بالرسالة صفحات لم ترد بالأصل

BIOCHEMICAL STUDIES ON SOME LEAFY VEGETABLES

BY

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ABSTRACT

Jews mellow (JM), Parsley (P), Rocket (R) and Leek (L) are the most important leafy vegetables crops in Egypt. These plants are rich in protein, dietary fiber, elements, carotenoids, polyphenols, flavonoids, vitamin C and E. The protein and ash amounted to 25.89 and 14.09 in JM, 23.36 and 10.33 in P, 23.90 and 12.16 in R, and 21.40 and 13.52 in L, respectively. While, crude fiber contents were almost always the same as ash percentages. The values of soluble dietary fiber (SDF) and insoluble dietary fiber (IDF) were 16.69 and 8.37 in JM, 10.11 and 15.30 in P, 9.28 and 12.55 in R, and 11.57 and 15.05% in L, respectively. The first limiting amino acid was cysteine and methionine except in L. A deficiency was also noticed in lysine score. It is noticed that arginine: lysine ratio increased, while methionine:glycine ratio decreased in all vegetables compared with casein.

The total phenolic compounds were almost the same in all vegetables, while total chlorophyll was slightly higher in both (R) and (JM) than other vegetables. Carotenoids in (R) and (P) were relatively higher than other vegetables. Tannins content could be ascending arranged as follows: (P), (R), (L) and (JM). The saponins contents were higher in (JM) followed by (L), but (R) was relatively higher in sterols and terpenes compared with other vegetables. The highest content of vitamin E was in (JM) followed by (R), (L) and (P). In contrast, (P) had a higher percent of vitamin C compared with other vegetables. Both polyphenols and flavonoids contents were relatively high in ethanolic extract. (JM) contained relatively high amount of chlorogenic acid, rutin, *O*-coumarin and kaempferol, while P had high content of apigenin. (R) contained high amounts of ferulic acid, salicylic acid and *O*-coumaric acid, whereas (L) had a high amount of resrocenol, rutin, myricetin, quercetin and kaempferol. The degree of solubility of elements in ethanolic extract were compared with dried leafy vegetables, however these extracts still had high antioxidants and biological activities.

The antioxidant activity increased with increasing the concentration of vegetable extracts from 500 to 1000ppm in corn oil. Antioxidant effectiveness was more obvious for both (R) and (L) extracts than (JM) and (P). Whereas, BHT, BHA and rutin at 1000ppm were more effective than other authentic antioxidants (tannic acid, catechin, quercetin and riboflavin) in preventing the oxidation process; however BHT and BHA had shown carcinogenic effect.

No effect could be observed for (JM) and (P) extracts on G^+ bacteria. However, a moderate effect was exhibited at a concentration of 1000ppm for (R) extract against both *Bacillus subtilis* and *Staphylococcus aureus*. In case of (L) extract a both concentration 500ppm and 1000ppm had shown an inhibition zone against *Staph. aureus*. In respect to G^- bacteria, (JM) and (P) extracts at 1000ppm showed a zone of inhibition against *Enterobacter aerogenes*. *Salmonella typhi* was inhibited by both (R) and (L) extracts at concentration of 500 and 1000ppm. While, different extracts did not show any zone of inhibition against *Saccharomyces cerviceae*.

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A significant decrease in serum glucose, total lipids, triglycerides, total cholesterol, LDL, GPT, protein, albumin, globulin, uric acid, urea, creatinine, and liver total lipids, triglycerides and total cholesterol, while increase in HDL, GOT were attained in diabetic rats given 10% dried leafy vegetables or its extracts than in diabetic rats given 5% compared with diabetic control. Rats of diabetic control lost their body weight at higher rate compared with rats fed on dried vegetables at either 5% or 10% of diet, almost the same pattern was obtained with rats given 5% or 10% extracts orally. No significant increase in liver, kidney, brain, heart and spleen weight either in rats fed on dried leafy vegetables or on their extracts when compared with diabetic control or normal control.

Moisture contents ranged from 49.42 to 54.91% directly after curing process, whereas these values increased since they ranged from 51.23 to 56.92% after 3 months of storage in bastrami supplemented with 5% (JM), (P), (R) and (L) extracts. Other components such as total protein, fats and ash% apparently decreased. Nitrogen constituents (TSN and NPN) increased slightly after being stored for 3 months. These extracts had antimicrobial effect especially on *Staph. aureus* which was diminished during the storage period also this effect was extended to lower both total counts and fungi during the storage period of bastrami. The organoleptic evaluation of bastrami product revealed that the highest scores were given to bastrami treated by (L) followed by (JM), the same trend was observed in case of bastrami color, aroma, texture and overall acceptability.

After being stored yoghurt supplemented with 0.1% and 0.2% of (JM), (P), (R) and (L) dried leaves or ethanolic extracts for 6 days at 7°C in the refrigerator, a significant drop in pH accompanied with an increase in total acidity in all treatments and control. Scores given to different parameters normally aroma, flavor and thickness were lowered slightly. Yoghurt blends stored for 6 days had a reverse trend since all scores which were given to flavor, aroma and thickness were higher than that given to plain yoghurt except for color and overall acceptability since all scores were almost always the same or slightly less than control. The same pattern was obtained for organoleptic scores given to yoghurt extract blends.

Conclusively, the dried leafy vegetables and its extracts contained proteins, minerals, pigments and dietary fiber fractions and other valuable antioxidants constituents, such as polyphenols, flavonoiods, carotenoids, vitamin C and vitamin E. Ethanolic extracts from (JM), (P), (R), and (L) showed the same antioxidant activity and antimicrobial, hypoglycemic and hypocholesterolemic effect. The incorporation of different dried leafy vegetables and/or their extracts in some foods such as Yoghurt and Bastrami were tried to encourage the consumption of such new products by a wide variety of people. In the same time to test for both palatability and their shelf life.

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