National Journal of Multidisciplinary Research and Development
ISSN: 2455-9040; Impact Factor: RJIF 5.22
Received: 10-06-2019; Accepted: 14-07-2019
www.nationaljournals.com
Volume 4; Issue 3; July 2019; Page No. 44-46

Pumpkin: As a functional food

Dr. K Peeter Simon[1], E Geetha lakshmi[2]
[1-2] Department of Food Technology, Jntua Anantapur, Andhra Pradesh, India

Abstract
Pumpkin is one of the popular vegetable crops in Asia. Pumpkin and pumpkin seed both are very popular, but somewhere it is considered as an underutilized crop. Pumpkin is found in many verities but they all are in near by same chemical structure and component. In nutritional context pumpkin is richest source of nutrient such as emery, protein and fat etc. pumpkin seed and its oil is most popular food product item now the days. It has been various medicinal properties and health benefits. Pumpkin is food for pregnant women and helpful in prevention of malnutrition. It also seen that pumpkin is helpful in management of various diseases such as Diabetes, Cardiovascular diseases and Anti carcinogenic.

Keywords: underutilized, nutrient, and diseases

Introduction
The pumpkin is a vegetable crop belonging to the cucurbitaceae family. This family contains chemicals, including tetracyclic triterpenes, saponins, proteins, fibers, polysaccharides and minerals (iron, zinc, manganese, copper, etc) [1]. The family is one of the largest families in plant kingdom comprising of highest number of edible plant species. Seeds embedded in a bright-yellow fibrous endocarp are large, non-endospermic and usually dark red in colour. It is needed to complement staples in food, supplying indispensable minerals and vitamins that may not be present in staple diets. They generally produce more nutrients per unit land area than staple foods. Pumpkin seed oil typically is a highly unsaturated oil, with predominantly oleic and linoleic acids present. Very low levels of linolenic acid or other highly unsaturated fatty acids are present, providing pumpkin seed oil with high oxidative stability for storage or industrial purposes and low free radical production in human diets. Studies of pumpkin seed oil triacylglycerol positional isomers found that oleic and linoleic acid distribution patterns are not random [2]. The highly unsaturated fatty acid composition of pumpkinseed oil makes it well-suited for improving nutritional benefits from foods. Pumpkin seed oil has been implicated in providing many health benefits [3].

In many developing countries, the supply of animal protein is inadequate to meet the protein needs of the rapidly growing population. This has necessitated contemporary research efforts geared towards the study of the food properties and potential utilization of protein from locally available food crops, especially from underutilized or relatively neglected high protein oilseed and legumes. Recently increased attention has been given to the utilization of agriculture waste products to produce food, feed, fertilizer and a raw material in industries, to maximize the available resources and at the same time to minimize waste disposal problem. Such utilization could be done economically only in the locations where such resources are available in large quantity. With increased public awareness in sustainable agriculture, clean and efficient energy and waste management technologies, pumpkin seeds have the opportunity to capture a new and emerging market share in the snack food industry. Currently, pumpkin seeds are gaining momentum in the snack food industry as a healthy alternative to other fried snacks. In India, during the last decade, the demand for new nutritionally sound and economically viable food has increased considerably. Consequently, much attention has been given to the use of vegetable by-products that are not commonly used by the food industry and the population.

History of pumpkin
Pumpkin and their seeds are native to America and various species are found across the North, South and Central America. Pumpkin seeds - a renowned food among many inhabitant American tribes, who consume these seeds for their nutritional and medicinal properties. From America, the pumpkin seeds got popularized and spread to the rest of the globe through trade and exploration over many centuries. India and other parts of Asia also included these seeds into a place of importance instead of discarding them. Today, China ranks first in production of pumpkin and pumpkin seeds in the whole world. India, Russia, the Ukraine, Mexico, and the U.S. are also major producers of pumpkin and pumpkin seeds.

Table 1: Nutritive Value

Nutrient	Amount	% Of RDA
Energy	559 kcal	28
Carbohydrates	10.71 gm	8
Protein	30.23 gm	54
Total fat	49.05 gm	164
Cholesterol	0	0
Dietary Fibre	6 gm	16

USDA National Nutrient Database

Table 2: Active Constituent of Pumpkin Seed

Amino acids	Alanine, Arginine, Cystein, Glycine, Histidine, Isoleucine, Lycine, Tryptophan (Glew *et al*., 2006) Cucurbitin (Chopra *et al*.,1956)
Essential fatty acids	□-Linolenic acid, Oleic Acid, Palmitic Acid And Stearic Acid, Linoleic Acid (The Wealth of India, 2004)
Minerals	Zinc, Selenium, Manganese (Glew *et al*., 2006)
Vitamins	Tocopherol (Stevenson *et al*., 2007)
Carotenoids	Lutein, □□Carotene (Parry *et al*., 2007)
Phytosterol	□□Sitosterol (Haas *et al*., 2006)
Glycosides	Saponin (Chopra *et al*.,1956
Phytoestrogens	Lignan (Slavin *et al*.,1999)
Triterpene	Squalene (Ryan *et al*., 2007)

Anti-nutritional factors

Anti-nutritional factors found in pumpkin seeds like haemogglutinin, saponins, tannins, anti-vitamins and phytic acid, which interrupt the absorption and utilization of minerals and adversely react with proteins to form complex products which have inhibitory effect on digestion of proteins.

Nutritional and dietary uses of Pumpkin

Pumpkins are consumed as freshly boiled and steamed or in processed form like soup and curry. It is high in β-carotene, which gives it yellow or orange color. Beta-carotene in plants that have a pleasant yellow-orange color is a major source of vitamin A [4]. It is also high in carbohydrates and minerals. Consumption of carotene containing foods helps in the prevention of dermatological ailments, eye disorders and certain cancers [28]. Incorporation of β -carotene rich ingredients in the form of pumpkin powder or flour in food products is therefore considered a very effective approach to eradicate vitamin-A related health problems [5].

Health Benefits of Pumpkin Seeds

Antioxidant and free radical scavenger

The antioxidant activity of pumpkin seeds methanol extract was determined using free radical DPPH (2, 2-diphenyl-1-picrylhydryzyl) scavenging and soybean lipoxygenase [LOX] inhibition. Results expressed as EC50 values for scavenging activity on DPPH radical assay is 5.57 mg/ml. In addition, metanol extract inhibit 50% of LOX activity at concentrations ranging from 0.3 mg/ml to 1.02 mg/ ml [6]

Anti-diabetic activity

With the rapidly increasing cases of diabetes and its high risk interms of economic perspective on world population, the research for safer and inexpensive medicines for the treatment of diabetes is new challenge and innovative aid to the era of medicine technology. The use of herbal sources with bioactive components such as pumpkin is one among them. Therefore, various studies for the anti-diabetic potential of pumpkin is one of them, which is a normally cultivated plant in farms and its fruits are used for human consumption in diabetic conditions [7].

Anti-carcinogenic effect

Cancer is a rapidly growing health problem; it presents the biggest challenge to researchers and medical professionals and has been selected for various prevention and therapeuticstrategies. The dietary intake of many vegetables and fruits has been found to reduce the risk of occurrence of cancer. Diets high in pumpkin seeds have also been associated with lower risk of gastric, breast, lung and colorectal cancers [8].

Other medicinal effects

Pumpkin-supplemented foods are considered as a good source of anti-inflammatory substances, which can help in many diseases such as arthritis, etc. Fahim *et al*. [9]. reported that pumpkin seed oil significantly inhibited adjuvant-induced arthritis in rats, similar to a well-known anti-inflammatory substance called indomethacin. It may well be considered that the supplementation of natural components with standard drugs might give synergistic, antagonistic and no-change effects (called drug interaction effects) during treatment of diseased conditions. Similarly, Fahim *et al*. [10]. tested the drug interaction effects of pumpkin seed oil with indomethacin and they found no effect in the adjuvant-induced arthritis model in rats. Pumpkin seed oil has potential hypotensive activity, as suggested by Zuhair *et al*. [11]. They also suggested that pumpkin seed oil has a very good drug interaction with hypotensive drugs such as felodipine (Ca antagonist) and captopril (an angiotensin-converting enzyme inhibitor), in regards to enhanced hypotensive potential in hypertensive animal models. Supplementation of pumpkin seed snacks showed a higher level of inhibitor of crystal formation or aggregation which will subsequently reduce the risk of bladder stone disease in the Thailand population [12]. Pumpkin seeds or orthophosphate supplementation at 60mg/kg (body weight) per d could reduce the incidence of bladder stones; the longer the supplementation period of pumpkin seeds, the better the results that can be found [13].

Conclusion

Pumpkin provides valuable source of nutrients such as carotenoid that have a major role in the nutrition in the form of pro-vitamin A. Pumpkin and pumpkin seed both are very nutritious. Being nutritious Pumpkin based products are rich in many nutrients such as protein and fat. Due to high content of Protein and vitamin A, Both pumpkin and its seeds are helpful in prevention of malnutrition and vitamin A deficiency. Pumpkin seeds have emerging bioactive compositions that promote health and human life. All of these findings bring us to the new idea in developing and innovating nutraceuticals, pharmaceuticals, and cosmeceuticals products from pumpkin seeds for the large range application.

References

1. Abuelgassim A, Al-Showayman. The Effect of pumpkin (Cucurbitapepo L.) seeds and L-arginine supplementation on serum lipid concentrations in atherogenic rats. AJTCAM. 2012; 9(1):131.
2. Jakab A, Jablonkai I, Forgacs E. Quantification of the ratio of positional isomer dilinoleoyl-oleoyl glycerols in vegetable oils. Rapid Commun. Mass Spetrom. 2003;

17(20):2295-2302.
3. Fu C, Shi H, Li Q. A review on pharmacological activities and utilization technologies of pumpkin. Plant Foods Hum. Nutr. 2006; 61(2):73-80.
4. Craig WJ. Phytochemicals: guardians of our health. J Am Diet Assoc. 1994; 977:1-11.
5. Dhiman. African Cucurbita pepo. Properties of seed and variability in fatty acid composition of seed oil. J of Phytochemistry. 2009; 54(1):71-75.
6. Dutta D, Dutta A, Raychaudhuri U, Chakraborty R. Rheological characteristics and thermal degradation kinetics of beta-carotene in pumpkin puree. J. Food Eng. 2006; 76:538-546.
7. Xanthopoulou MN, Nomikos T, Fragopoulou E, Antonopoulou S. Antioxidant and lipoxygenase inhibitory activities of pumpkin seed extracts. Food Res Intern. 2009; 142:641-646.
8. Kwon YI, Apostolidis E, Kim YC. Health benefits of traditional corn, beans, and pumpkin: in vitro studies for hyperglycemia and hypertension management. J Med Food. 2007, 10:266-275.
9. Huang XE, Hirose K, Wakai K. Comparison of lifestyle risk factors by family history for gastric, breast, lung and colorectal cancer. Asian Pac J Cancer Prev. 2004; 5:419-427.
10. Fahim AT, Abd-el Fattah AA, Agha AM. Effect of pumpkin-seed oil on the level of free radical scavengers induced during adjuvant-arthritis in rats. Pharmacol Res. 1995; 31:73-79.
11. Zuhair HA, Abd El-Fattah AA, El-Sayed MI. Pumpkin-seed oil modulates the effect of felodipine and captopril in spontaneously hypertensive rats. Pharmacol Res. 2000; 41:555-563.
12. Suphiphat V, Morjaroen N, Pukboonme I. The effect of pumpkin seeds snack on inhibitors and promoters of urolithiasis in Thai adolescents. J Med Assoc Thai. 1993; 76:487-493.
13. Suphakarn VS, Yarnnon C, Ngunboonsri P. The effect of pumpkin seeds on oxalcrystalluria and urinary compositions of children in hyperendemic area. Am J Clin Nutr. 1987; 45:115-121.