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THE NUTRITIONAL VALUE OF THE PUMPKIN (*CUCURBITA MAXIMA*) GROWN IN ROMANIA

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Abstract. *Pumpkin (Cucurbita maxima) is one of the best vegetables that meet the needs of a healthy diet. This delicious and valuable vegetable is rich in biologically active compounds, present both in the pulp and in the peel and seeds, which gives it special dietary qualities. Pumpkin is considered, by some scientists, to be a food that meets all the requirements necessary for people to have a healthy diet. Cucurbita maxima can be consumed both fresh and in canned form, including soups, smoothies and juices and he is used in the food industry as a functional food, in bakery products, beverages, meat and dairy products. Pumpkin is considered a valuable food because its pulp contains a large amount of carotenoids, including β-carotene, lutein, potassium, vitamins C, B2 and E. The health benefits of the pumpkin consumption are: anti-inflammatory, antibacterial and anti-carcinogenic action, as well as anti-diabetic and anti-hypertensive properties. Cucurbita maxima seeds represent an excellent economic source of lipids, proteins, carbohydrates, but also other nutrients required in the human diet to maintain health. Pumpkin seeds are rich in macronutrients such as magnesium, phosphorus and calcium, and contain moderate amounts of micronutrients such as manganese, copper and zinc. Pumpkin is an important source of vitamin A and contains significant amounts of vitamin C, vitamin E, lycopene and dietary fiber.*

Keywords*: Cucurbita maxima, pumpkin pulp, pumpkin seed, nutritional value.*

INTRODUCTION

In our daily diet, vegetables and fruits have an important place, being the main sources of nutrients, with a role in preventing and reducing the risks of illness [1]. In recent years, consumers' attention has increasingly turned to functional foods, which ensure a sufficient intake of nutrients, but also increase health. Pumpkin is considered, by some scientists, to be a food that meets all the requirements necessary for people to have a healthy diet [2,3].

The exact origin of the pumpkin is not known, but it is assumed that it was cultivated around 5500 BC. on the territory of Mexico. Today, the pumpkin is almost everywhere, being found especially in Europe, North and South America, but also in some regions of Asia (India, China). China, India and Russia account for the largest share of global production. In India, the total area under pumpkin cultivation is 1.8 million hectares, more than three times that of China. Almost all the organs of the pumpkin plant (fruits, flowers, leaves, roots, shoots and seeds) are edible, with some differences between varieties [4].

In the past, pumpkin was an underappreciated vegetable by consumers and farmers, but nowadays it has become one of the most popular vegetables, being a basic ingredient in various preparations with dietary properties or a main component in obtaining purees, jellies, jams, juices and more [2,3].

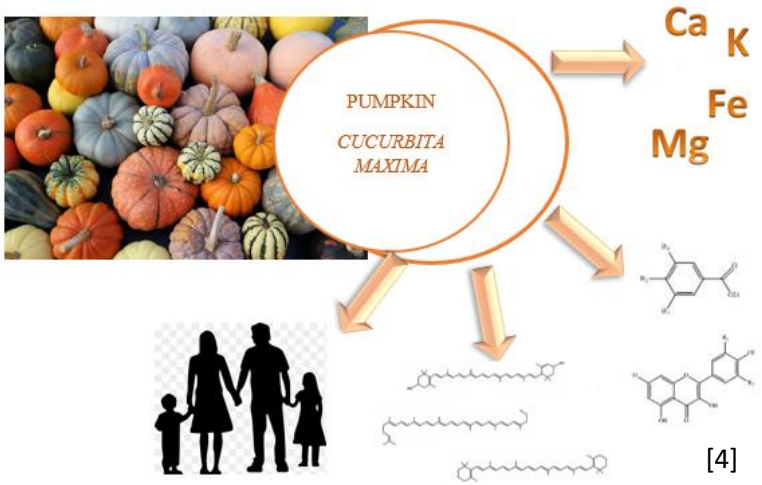
Pumpkin (*Cucurbita maxima*) is an angiosperm, annual, climbing plant that is part of the *Cucurbitaceae* family, found in different sizes, colors and shapes. The skin of the pumpkin is relatively hard, and inside it is the thick edible pulp and many seeds that can be brown or white in color [3,5,6].

Figure 1: (a) pumpkin pulp, (b) pumpkin seeds, (c) peeled pumpkin seeds

Currently, pumpkin is considered a valuable food because its pulp contains a large amount of carotenoids, including β-carotene, lutein, potassium, vitamins C, B2 and E. In winter, several varieties of pumpkin are characterized by a higher content of vitamin C. Also, depending on the variety, the caloric value of pumpkin varies between 15-25 kcal/100g, being very low, and due to its content in numerous nutrients that are easy to digest, it has become a component important in diets used for weight loss. It presents several beneficial properties for health such as: regulation of metabolism, lowering of blood glucose levels, detoxification, defense against cancer. Due to the high content of pectin, pumpkin is used to clean the intestine and helps the body to get rid of accumulated radionuclides [2,3].

Cucurbita maxima seeds represent an excellent economic source of minerals, lipids, proteins, carbohydrates, but also other nutrients required in the human diet to maintain health [7].

Since the nutritional and qualitative composition of pumpkins can be different depending on their varieties, origins and growing environments, it is necessary to know the nutritional profile in order to be able to effectively use all parts of the pumpkin as a functional food component or medicinal plant [2].



[4]

Health proprieties

In recent years, pumpkin (*Cucurbita maxima*) has shown increasing interest among researchers due to its nutritional value, being an accessible food rich in bioactive compounds. In many regions of the world, pumpkin is used for medicinal purposes due to its multiple properties, being especially appreciated in countries such as Austria, Hungary, Mexico, Slovenia, China, Spain, but also in many other countries in Europe, Asia and Africa. Globally, pumpkin is grown for its peel, pulp and seeds. Its large seeds contain significant amounts of polyunsaturated and monounsaturated fatty acids. Among the main components of pumpkin seed oil are linoleic acid, oleic acid, palmitic acid, tocopherols, ß-sitosterol and delta-7-sterols [8].

Pumpkin seeds, which are often removed during processing, are actually very nutritious, providing a high-quality oil and an important source of protein. At the same time, they are rich in minerals, dietary fiber, vitamins essential for health and monounsaturated fatty acids, which support cardiovascular health. The specific flavor of pumpkin seeds and the oil extracted from them is appreciated globally, developing especially during roasting, bringing extra flavor to food. Because of its nutritional benefits and pharmacological properties, including antidiabetic, antifungal, antibacterial, anti-inflammatory and antioxidant effects, pumpkin seeds are attracting increasing interest. Also, the high content of unsaturated fatty acids in pumpkin seed oil makes it ideal for improving the nutritional value of foods.

Pumpkin seeds are rich in macronutrients such as magnesium, phosphorus and calcium, and contain moderate amounts of micronutrients such as manganese, copper and zinc, making them a valuable dietary supplement. In addition, pumpkin, being an affordable and nutrient-rich source, is used in various food products, such as pumpkin-fortified flour, which is economical and has excellent sensory qualities. Pumpkin seeds are a valuable source of minerals, especially zinc, phosphorus, magnesium, potassium and selenium, which help fight diseases such as arthritis, inflammation and prostate cancer [9].

Over time, numerous researches have focused on the active compounds in pumpkin peel, pulp and seeds, demonstrating their beneficial health effects, such as anti-inflammatory, antibacterial and anti-carcinogenic action, as well as anti-diabetic and anti-hypertensive properties [8,10].

Nutritional composition of pumpkin

Pumpkin is an important source of vitamin A and contains significant amounts of vitamin C, vitamin E, lycopene and dietary fiber. Its antioxidant activity is essential for people with prediabetes, diabetes or vascular damage. In

addition to fat-soluble antioxidants such as tocopherols and carotenoids, vitamin C, which is a water-soluble antioxidant, plays a crucial role in protecting cells from free radical damage by donating electrons and regenerating other antioxidants such as would be vitamin E. Pumpkin seeds are also a good source of potassium, phosphorus and magnesium, along with moderate amounts of calcium, sodium, manganese, iron, zinc and copper, making them valuable as dietary supplements [11]. Pumpkin is a valuable source of carotenoids, which play an essential role in nutrition. Because of this high carotenoid content, pumpkin-based foods can help prevent skin and eye conditions, providing protection against diseases associated with vitamin A deficiency [12].

Pumpkin contains many essential minerals for human health, and its pulp is rich in phytosterols and phytonutrients. Pumpkin seeds, often considered agricultural waste, are full of bioactive substances with remarkable nutraceutical potential. Minerals such as zinc, phosphorus, magnesium, potassium and selenium in pumpkin seeds give them a high nutritional value and make them an important ally in fighting diseases such as arthritis, inflammation and prostate cancer. Although seeds have been undervalued in the past, they now have a significant role in nutrition and can be consumed daily without negative health effects. The different parts of pumpkin (seeds, peel and pulp) are rich sources of micro- and macronutrients, including carbohydrates, fiber, amino acids, mono- and polyunsaturated fatty acids (MUFA and PUFA), tocopherols and carotenoids [8].

Mineral composition of pumpkin peel, fruit, and seed [8].

Nutrient	Pumpkin Peel (mg/ 100 g)	Pumpkin Fruit (mg/ 100 g)	(mg/ 32.25 g)
Calcium	1.360	21	14.84
Iron	4.004	0.8	2.84
Magnesium	3.353	12	190.92
Phosphorous	1.419	44	397.64
Potassium	687.467	340	260.90
Sodium	9.652	1.0	2.26
Zinc	0.150	0.32	2.52
Copper	0.025	0.127	0.43
Manganese	0.360	0.125	1.47
Selenium	NR	0.3 µg	NR

Basic nutritional composition of pumpkin peel, fruit, and seed [8]

Nutrient	Pumpkin Peel (Value/ 100 g)	Pumpkin Fruit (Value/ 100 g)	Pumpkin Seed (Value/ 32.25 g)
Energy	520.78 kJ	109 kJ	NR
Water	89.527 mg	91.6 g	1.69 g
Lipids	1.650 mg	0.1 g	15.82 g
Protein	14.670 mg	1.0 g	9.75 g
Ash	7.317 mg	0.8 g	1.54 g
Dietary Fiber	13.383 mg	0.5 g	1.94 g
Carbohydrates	12.407 mg	6.5 g	3.45 g

Uses of Pumpkin

Several by-products can be obtained from the pumpkin, such as seeds, peels and skins, which are often discarded by industries or households. These by-products can be used effectively by extracting the bioactive components from them and integrating them into the food industry with the aim of improving the nutritional value of the new products obtained. Pumpkin contains numerous bioactive compounds, such as carotenoids, lutein, zeaxanthin, vitamin E, ascorbic acid, phytosterols, selenium and linoleic acid, which act as antioxidants in the human diet. The different parts of the pumpkin are excellent sources of functional ingredients.

Pumpkin is used in the food industry as a functional food, in bakery products, beverages, meat and dairy products. Pumpkin flour, for example, helps develop the gluten network in the dough, which helps the bread rise. These aspects not only improve the nutritional but also the functional qualities of the bread. Pumpkin leaves and pulp are also used to prepare soups, purees, jams and pies [13].

Pumpkin can be consumed both fresh and in canned form, including soups, smoothies and juices. Pumpkin pulp is included in the composition of bread, cookies, biscuits, chocolate, etc. In addition, the flowers, leaves, fruit, bark and seeds are all edible parts of the plant [14, 15].

Also, the pumpkin has been used to obtain probiotic foods [16].

CONCLUSIONS

- Pumpkin is rich in vitamins (A, C, E), minerals (zinc, potassium, magnesium) and dietary fiber, which makes it an essential ingredient for a healthy diet.
- Pumpkin contains bioactive compounds such as carotenoids and phytosterols that help protect the body against oxidative stress and inflammation.
- Pumpkin, an excellent source of dietary fiber, is frequently used in culinary preparations to enhance their nutritional quality and texture.
- It can be used in various forms, including fresh, canned, as juices, purees, soups, sweets and baked goods, making it a valuable ingredient in the kitchen.

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