

A nutraceutical approach towards corn silk

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Abstract

Corn silk is an herb plant used as traditional medicine throughout the world to treat many diseases. The scientific name of corn silk is *Stigma Maydis*. Corn silk consists, of carbohydrates, vitamins, and proteins some calcium, Na salts, K, and Magnesium. Corn silk contains volatile oils, certain steroids such as stigmasterol and sitosterol, tannins, saponins, alkaloids, and flavonoids. Organic acids found in corn silk include formic acid, oleic acid, palmitic acid, linoleic acid, stearic acid, succinic acid, and lactic acid. For decades, corn silk has been used as a diuretic, Antilithiatic, and uricosuric, as well as to treat cystitis, gout, and kidney stone and as an oral antidiabetic medication. The antioxidant potential of the corn silk and its healthcare applications as agents of diuretics, for the reduction of hyperglycemia, as an anti-fatigue, and as an anti-depressant, use have been claimed in many studies. Teas and supplements of corn silk are used to treat urinary-related problems. The present reviews will provide the complete health potential of corn silk.

Keywords: Diuretic; Uricosuric; Cystitis; Nephritis; Hyperglycemia

1 Introduction

Maize (*Zea mays*. L) Is one of the large amounts of planted food crops in the world, and one of the main energy sources among the population of the semiarid zone? *Zea mays* L. is commonly known as maize, and it is a popular grain crop. It holds a prominent position among the world most significant edible grains. It is proven in many studies that the grains, leaves, corn silks, stalk, and inflorescence of the maize plant are used fully for the cure of several diseases. Corn silk is a byproduct of fresh corn and a source of natural antioxidants such as flavonoids, and bioactive compounds such as alkaloids, volatile oils, and steroids, as well as several other phenolic compounds with favorable effects on human health and minerals such as Mn, Zn, K, Mg, and Ca [1].

Nutrients found in food are classified as a food's hidden quality. Alkaloids, phenolic, flavonoids, and steroids are found in corn silk grown on the cob. Corn silk had a high moisture content of 57.50%, due to its soft and humid nature. Corn silk contains 27.8g of carbohydrates and 5.78g of protein. The silk contained only 0.36g of fat. Because of its fibrous structure, maize silk contains six grams of crude fiber; likewise, Corn silk contains a lot of minerals like potassium (1079.80mg), and sodium (720.27mg) as corn silk absorbs enough minerals from the soil [1,2].

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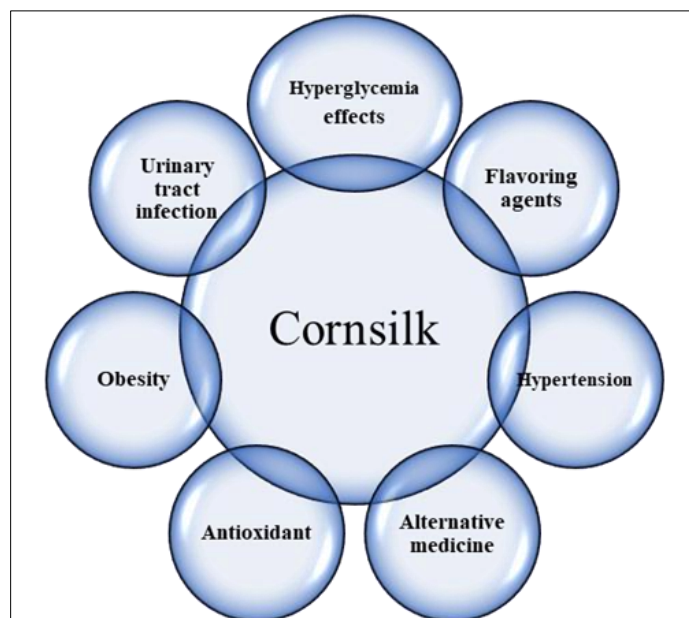


Figure 1 Health benefits of Cornsilk

2 Hyperglycemia affects

An unusually high concentration of sugar in the blood is referred to as hyperglycemia. The corn silk extract increase insulin production in animals and help full for the recovery of the damaging part of β -cells of the pancreas and also control the blood sugar level in rats [3]. Corn silk is a very important source of natural antioxidants such as flavonoids, bioactive compounds such as alkaloids, volatile oils & steroids and some other phenolic compounds with beneficial effects on human health and minerals such as Mn, Zn, K, Mg, and Ca. The finding of the previous study shown that the 9.65% moisture, ash is 3.91%, fat is 0.29%, protein, 3.91 40% dietary fiber are present in corn silk. In many investigations, the benefits of corn silk health have been reported. The extract of corn silk (CSE) benefits on glycemc metabolism and is not the only cause of enhancing glycogen and preventing the gluconeogenesis (GNG) but through increasing insulin levels as well as recovering the damaged β -cells [4, 5, 6].

2.1 Flavoring agents

Some local varieties of corn silk are good and used in food processing as a flavoring agent in several regions of the world. For example, the powder of corn silk is used in food as a food additive for improving the content and physical characteristics of beef patties. Tea, powder, and cosmetics made from corn silks are now available in Korea, China, the United States, Japan, and the United Kingdom. However, the corn silk is still considered as a waste product of corn processing. There are ample chances to change such a waste into value-added products from corn [5].

2.2 Hypertension

Hypertension is a disease or disorder of abnormally high blood pressure within a body. Hypertension is a chronic disorder characterized by high blood pressure in the veins. In the year 2000, almost a billion people worldwide, or 26% of the world's adult population, had hypertension. It was common in both developed (333 million) and undeveloped countries (640 million) [7,8].

Antihypertensive drugs fall into many categories one of them is diuretics: Diuretics are drugs which cause the low blood pressure by the reduction of sodium and reducing blood volume by inducing urine flow and through other mechanisms. The increased renal output of water is followed by salt depletion in the body, resulting decreased in blood volume. This decreases blood pressure by reducing cardiac workload, plasma volume and oxygen demand. Hence, diuretics play an excellent role in hypertensive patients, In the treatment of congestive heart failure, glaucoma, diabetes patients, and liver ailments [9]. Corn silk bears the property of diuretics thus it lowers the blood pressure and increases renal excretion by these ways there are considerable good results of corn silk tea for the hypertensive patient as it lowers the blood pressure of individual [9,10]

3 Alternative medicine

Corn silk was used for a long period of time as a therapeutic medication for a variety of diseases, and it is significant as an alternative natural-based treatment. Corn silk supplements have been claimed to offer several health benefits, including lowering blood pressure, reducing prostate inflammation, diabetes and urinary tract infection, edema and obesity, and inducing relaxation. Corn silk also exhibits the antioxidant property, has an effect on the diuresis and kaliuresis, antihyperlipidemic effect. In another study finding that Maysin, an isolated form of maize silk, has significant Neuroprotective effects via anti-oxidative, anti-apoptotic, and immunomodulatory properties [11].

3.1 Antioxidant

An antioxidant is a substance that has properties to slow or prevent the oxidation of another chemical. From the aspect of nutrition, one group of vitamins acting against the free radicals is known as antioxidants [12,13]. Antioxidants are chemical substances that neutralize free radicals and protect living organisms from environmental damage, as a result, reactive oxygen species are uncontrollably protected and DNA strands are broken. Plants have been used as medicine for many human diseases for millennia since they contain several therapies for the treatment and free radical scavenging properties. There is a significant interest in studying edible plants, which include antioxidants and Phytonutrients that may decrease the burden of chronic conditions, as well as nutrigenomics.

Corn silk, also known as *Maydis stigma*, is a soft fiber-like growth that grows alongside the ear of corn. Corn silk thread ranged in length from 10 to 20 cm and was light green or yellowish brown in color [12,14]. Corn silk contains antioxidants such as sterols, saponins, allantoin, particularly beta-sitosterol and plant acid, anthocyanins, alkaloid, stigmaterol, vitamin K, vitamin C, mucilage, polyphenols, and tannins. Corn silk contains a wide range of chemical nutritional elements such as alkaloids, tannins, minerals, proteins, vitamins, carbohydrates, flavonoids, steroids, and volatile molecules. Corn silk glycoproteins reduce the development of IgE antibodies while enhancing the formation of IgG and IgM antibodies [15, 16].

Corn silk has a number of pharmacological activities, including immunological function, regulation, anti-diuretic, anti-tumor, anti-oxidation, antibacterial activity, urinary tract stone formation, and reduction of blood glucose, blood lipids, and blood pressure levels. Maize has a good impact on the traditional use of corn silk for urinary issues, cooling, and high cholesterol. Corn silk is used to provide unique natural antioxidants and flavoring compounds for a range of applications. In Greece, corn silk decoction is used to treat urinary bladder disorders, whereas, in the Philippines, the plant is used as a diuretic, anodyne, and demulcent. Corn silk fluid extraction is available on the market as a treatment for the irritable bladder. The recent study revealed that corn silk has the nutrient's total antioxidant activity as well as phenolic content [17,18,19].

3.2 Obesity

The state of being obese due to excess body fat is referred to as obesity. Obesity is currently recognized as a global public health issue, and as a result, numerous diseases have spread around the world, including diabetes, cardiovascular disease, several types of cancer, reduced life expectancy, as well as impaired cognition and motor function reduced life expectancy, as well as poor cognition and motor function.

Maintaining healthy body weight and avoiding excessive fat accumulation are essential parts of nutritional management for reducing body fat accumulation, and adipocyte development in adipose tissue should be controlled. In order to limit fat accumulation, lipogenesis must be prevented and lipolysis must be increased in tissues which were not adipose tissue [1,20].

In another research, corn silk extract was found to be anti-obesity. However, the effects of corn silk extract (CSE) on gene mRNA levels include in lipolysis, lipogenesis, and triglyceride synthesis are unknown. The purpose of this study was to examine the anti-obesity impact and mechanism of high Maysin corn silk extract in animals fed a high-fat diet [14,8].

Recently, the physiological qualities of maize silk were examined in a study, which indicated that corn silk extract has an anti-obesity effect, however, the mechanism has not been determined. In this study, the animals who received a high-fat diet for 8 weeks coupled with 100 mg/kg of high Maysin corn silk extract (CSE) demonstrated a spectacular result in terms of body-reducing weight as compared to the high-fat diet only group [21].

In another study, researchers discovered that using corn silk reduced body fat by elucidating mRNA expression levels of proteins involved in adipocyte differentiation, lipolysis, fat accumulation, fat production, and fat oxidation in adipose tissue and the liver was measured [7,22].

3.3 The Urinary tract infection

It is basically the inflammation of the urinary tract. Due to some infection, the urinary tract is inflamed and as a result, an individual tract becomes infected and the patient may suffer from multiple problems related to urine infection. UTI is an infection of the urinary tract that can affect any part of the urinary system, including the kidneys, ureters, urethra, and bladder. The bladder and urethra are the most commonly infected parts of the urinary tract [3, 20, 23].

Corn silk tea has diuretics, antioxidant, anti-hypertensive, and anti-inflammatory properties, it helps in detoxification of the kidneys. Due to these properties of corn silk, it helps in kidney problems. It also prevents urinary tract infections. Excess urination helps to prevent gout, and edema in an individual which further prevent many chronic problems [13, 20].

4 Conclusion

Corn silk is a medicinal herbaceous perennial plant that grows in the cob of the corn plant and can reach a height of 4-6 inches. It has numerous medicinal and nutritional characteristics. According to the findings of this study, corn silk is high in minerals such as salt and potassium. Because of its strong antioxidant and phenolic content, it can be utilized to cure a variety of disorders. Corn silk extract may have antihypertensive and diuretic properties. CSE treatment markedly reduced hyperglycemia. The extract of corn silk has benefits on glycemic metabolism that is not the only cause of increasing glycogen and preventing the gluconeogenesis, but through increasing insulin levels as well as recovering the damaged β -cells. Corn silk is a naturally occurring plant which can be eaten for a long time.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors have not any conflict of interest and not any affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs).

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