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An Update on Pharmacological Activity of Ipomoea Batata

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Abstract: *Ipomoea batatas L. (Lam.) commonly known as "sweet potato" is of great medicinal properties due to the presence of the nutrients and bioactive. The bioactive carbohydrates, proteins, carotenoids, flavonoids, anthocyanins, phenolic acids and minerals are diverse nutrients present in the leaves and roots of sweet potato possess valuable medicinal plant having anti-cancer, antioxidant, antidiabetic, and anti-inflammatory, antiulcer, antimicrobial activities. Traditionally Sweet potato was used in the treatment of various diseases such as asthma, bug bites, burns, catarrh, ciguatera, convalescence, diarrhoea, dyslactea, fever, nausea, renosis, splenosis, stomach distress, whitlows, burning sensations, constipation, general weakness, renal calculi, and sexual stimulant. The general objective of this paper is to provide an overview of the nutritional value, health advantages and therapeutic qualities of sweet potato. This review also focuses on the phytochemical and pharmacological properties of Ipomoea batatas. This review highlights the pharmacological reports on different forms of sweet potato and their potential medicinal values.*

Keywords*: Antioxident, Reactive Oxygen species, Anti-inflamatory*

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1. INTRODUCTION

Ipomoea batata, often known as sweet potato, is a dicotyledonous plant with starchy, big, and sweet tuberous roots that is a member of the Convolvulaceae family. Sweet potatoes, which originated in Central America, are now widely produced and consumed worldwide [65,66]. By the early 1500s, European explorers had introduced the crop to Africa and India, China by 1594, and Taiwan and Miyoko Island in Japan by 1597 [67, 68, 69,70]. Sweet potatoes are classified into aboveground and subsurface sections. The aboveground portion is made up of leaves, stalks, flowers, and seeds, whilst the subterranean portion is made up of roots. Sweet potato tips, which are 10 to 15 cm from the stem's end, as well as leaves and stalks among the shoots, are grown 50 to 60 days after tubers are cut straight into the field [60,61]. Mostly, sweet potato is cultivated for their tubers however, the leaves are sometimes eaten in place of other green vegetables. [5] Sweet potato skins available in a variety of colours including white, cream, yellow, orange, pink, red, and purple [6]. The roots are edible and frequently long and tapering, with medium-sized sympetalous blooms [7]. The roots contain starch, sugars, vitamin C, pro vitamin A, iron, and minerals. [1] The palmately lobed or heart-shaped leaves of the sweet potato are rich in polyphenols such as caffeic acid and caffeoylquinic acid derivatives. [2] Frost is not tolerated by the plant. It thrives at 24 °C (75 °F) on average, with lots of sunshine and warm nights. The ideal rainfall range is thought to be 750–1,000 mm (30–39 in), with a minimum of 500 mm (20 in) during the growing season. Although sweet potatoes can be grown on a variety of soils, the plant prefers well-drained, light- to medium-textured soils with a pH range of 4.5-7.0. [8] With a short growing season of 90 to 120 days and a high nutritional content, sweet potatoes cultivate on relatively poor soils with few inputs. [4] With an annual production of more than 90 million tonnes, mostly from Asian and African countries, especially China, it is among the most vital, diverse, and underrated food crops in the world. After rice, wheat, maize, and cassava, sweet potato is the fifth most important food crop in developing countries and the sixth most important food crop globally. After India, Bangladesh is the second-largest producer of sweet potato in South Asia, contributing about 68% and 27% of the total production, respectively, whereas Sri Lanka only produces 5% [3]. Because of its excellent nutritional and therapeutic characteristics, the sweet potato plant can be used for medicinal purposes in addition to being a food resource. Phytochemicals of Sweet potato have a variety of healthpromoting effects on humans, including anti-oxidant, anti-mutagenic, anti-inflammatory, antibacterial, and anti-carcinogenesis [9]. The leaf decoction is used as folk remedies for tumours in the mouth and throat. This is a folk remedy for asthma, bug bites, burns, catarrh, ciguatera, convalescence, diarrhoea, dyslactea, fever, nausea, renosis, splenosis, stomach distress, whitlows, burning sensations, constipation, general weakness, renal calculi, and sexual stimulant [28,29]. In the Philippines, young leaves and shoots of sweet potato are traditionally used as a medication to treat diabetes [10]. A variety of sweet potato has been consumed raw in parts of Kagawa, Japan, to treat anaemia, hypertension, and diabetes. [11,12] In Brazil, inflammatory and infectious oral disorders have been successfully treated with the help of sweet potato leaves as an herbal remedy [13,14].

Table 1: Nutritional value of sweet potato [16,17]

Proximate parameter	**Nutritional value per 100 g**	
	ROOT TUBER	**LEAF**
WATER	77.28	86.81
Energy(kcal)	86	42
Carbohydrates(g)	20.12	8.82
Protein (g)	1.57	2.49
Total fibres (g)	3	5.3
Total lipid (g)	0.05	0.51
Vitamin a (iu)	14187	3778
Thiamine (mg)	0.078	0.156
Riboflavin (mg)	0.061	0.345
Niacin (mg)	0.557	1.130
Vitamin b6 (mg)	0.209	0.190
Folate (b9) (µg)	11	1
Vitamin c (mg)	2.4	11
VITAMIN K (µg)	1.8	302.02

SCIENTIFIC CLASSIFICATION

Scientific name	Ipomoea batatas	**Division**	magnoliophyte
Domain	Eukarya	**Class**	magnoliopsida

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Kingdom	Plantae	**Genus**	Ipomoea
Rank	Species	**Order**	Solanales

PYTOCHEMICALS IN SWEET POTATO

Purple sweet potatoes have been shown to have a high concentration of anthocyanins in its storage root, with cyanidin and peonidin being the most abundant [87]. Sweet potatoes are rich in polyphenols, terpenoids, saponins, glycosides, alkaloids, steroids, and other useful bioactive components [15]. Other phytochemicals, such as alkaloids, anthraquinones, oxalates and steroids, are reported in the leaves at concentrations of 345.7, 328.4, 1.66 and 0.375 mg/100 g dry weight, respectively and lesser amounts of phytic acid, cyanide, saponins and tannins [37,38]. Of these, the predominant bioactive components are phenolic compounds like phenolic acids (e.g., caffeic acid, monocafeoyl quinic (chlorogenic acid), caffeoylquinic acid (CQA) derivatives (primarily mono-CQA, di-CQA and 3,4,5-triCQA), p-coumaric acid, sinapic acid, hydroxybenzoic acids, and p-anisic acids), flavonoids (e.g., quercetin, myricetin, luteolin, and apigenin, etc.), and anthocyanins (cyanidin-, peonidin- and pelargonidin-derivatives) [39,40,41,42,43]

Sweet potato also contains phenolic acids such as chlorogenic, isochlorogenic, caffeic, cinnamic, and hydroxycinnamic acids. Phenolic acids have been linked to the colour, sensory aspects, nutritional value, and antioxidant capabilities of foods. [48,49].

Sweet potatoes also have key chemical components such as starch, protein, vitamins, minerals, and dietary fibre. Sweet potatoes also include dietary fibre, hemicellulose, and cellulose, which have anti-cancer and anti-vascular disease properties [101,102].

While possessing helpful components, sweet potato leaves and roots include several antinutrients such as phytic acid, cyanide, tannins, oxalates, and anthraquinones. [44,45,46,47].

PHARMACOLOGICAL PROPERTIES

Ipomoea species are used across the world to cure a wide range of illnesses, including diabetes, hypertension, diarrhoea, constipation, tiredness, arthritis, rheumatic disorders, hydrocephaly, meningitis, renal problems, and inflammations. They also have antibacterial, analgesic, spasmolytic, spasmogenic, hypoglycaemic, hypotensive, anticoagulant, anti-inflammatory, psychotomimetic, and anticancer properties [104]. Ipomoea batatas extracts have anticancer and antitumor effects by suppressing proliferation and causing apoptosis in cancer cells [105]. The leaves of Ipomoea batatas are natural source of phenolic compounds with high antioxidant activity and potential antioxidant usefulness [106]. It also has antiulcer properties and help in healing of stomach lesions and ulcer scars [107]. The roots

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of sweet potatoes have the capacity to lower blood glucose levels. In vivo studies have indicated that different varieties of sweet potatoes can help manage blood sugar levels and minimise insulin resistance [108]. It also has cardioprotective effect. Its leaf extract inhibited in vitro low-density lipoprotein oxidation, which was attributed to the antioxidant action of leaf phytochemicals in human subjects [110]. Sweet potato also has anti-inflammatory effect. Its leaves extract has shown to down-regulate the expression of pro-inflammatory molecules, such as TNF-α and IL-6 [111]. Sweet potato also has antimicrobial activity. Its lyophilized leaf powder inhibited the development of Gram positive and Gram-negative microorganisms [112].

ANTIOXIDANT PROPERTIES

Purple-fleshed sweet potato (PFSP) (Ipomoea batatas L. Lam) has a high anthocyanin content, which contributes to its antioxidant action [33]. The leaves of Ipomoea batatas are natural source of phenolic compounds with high antioxidant activity and potential antioxidant usefulness [18]. The biofortified yellow fleshed sweet potato (Ipomoea batatas), cv. Beauregard is considered a food with strong antioxidant activity and pro-vitamin A activity, with ease cultivation and minimal production investment [19,20]. The presence of antioxidants confers therapeutic and preventative capabilities on illnesses, because harmful forms of oxygen, derived from human metabolism or the environment cause artery clogging, carcinogenic, cause joint and nervous system damage, and contribute to ageing [21,22].

Lucia Maria JAEGER DE CARVALHO (2022) evaluated that comparison to cv. Carrot, Beauregard sweet potato had the greatest iron, zinc and β-carotene values in raw, bleached, and dried samples (data not reported). It was expected because Beauregard yellow sweet potato is a biofortified cultivar [23].

Maria Dinu (2018) demonstrated the study about the significance of sweet potato leaves (both the blade and petiole) as a natural source of antioxidants. The two sweet potato cultivars employed in this study had the greatest carotene content in the blades, with Pumpkin having 25.05 mg/100 g FW and Chestnut having 23.80 mg/100 g FW. The ability to scavenge free radicals is related to the availability of total polyphenols, which were abundant in the leaf petiole. These polyphenols also showed significant antioxidant activity in Pumpkin (62.186 mol TE/g FW) and much greater activity in Chestnut (95.168 mol TE/g FW). The significant correlations between carotenes and antioxidant activity and total polyphenols and antioxidant activity show that phenolic chemicals are primarily responsible for the antioxidant activity of the blade and leaf petiole [24].

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In recent study (Benjamin Ogunma Gabriel 2019) the n-hexane extract was observed to possess the highest free radical scavenging potential with percentage inhibition of 39.21 ± 1.70% at 100 µg/ml when compared with the standard (ascorbic acid) 89.02 ± 2.21 at 100 µg/ml [25].

ANTIULCER ACTIVITY

Sweet potato (Ipomoea batatas) is recognised as a functional food due to its nutraceutical compounds. These dietary components may help in the healing of stomach lesions and ulcer scars [27].

Vandana Panda and Madhav Sonkamble (2012) studied anti-ulcer activity of the tubers of ipomoea batata (sweet potato) in cold stress and aspirin-induced gastric ulcer in wistar rats. This study shows that Ipomoea batatas tubers have a significant ulcer healing effect, which appears to be connected to the phytoconstituents' free radical scavenging activity and capacity to suppress lipid peroxidative processes. Thus, the current study seeks to emphasise the health advantages of sweet potato, establish it as a potent "functional food," and encourage its usage as a vegetable to supplement people's diets [26].

SATHISH RENGARAJAN, M. RANI, and NATARAJAN KUMARESAPILLAI (2012) demonstrated a study of ulcer protective effect of ipomoea batatas (l.) dietary tuberous roots (sweet potato). The early phytochemical analysis of ethanolic extract of ipomoea batata revealed that it contains carbohydrates, glycosides, phenolic compounds, phytosterols, proteins, flavonoids, and triterpenes. Ipomoea batatas demonstrated a substantial ($p<0.01$) decrease in ulcer index as compared to the toxicant group in the pylorus ligation-induced ulcer model. The ethanolic extract of ipomoea batata reduced ulcer index by 55.24% and 61.45% at 250 & 500 mg/kg doses respectively; the gastric volumes were also reduced significantly ($p < 0.01$). In cold restraint stress model, both doses of Ipomoea batatas (250 & 500 mg/kg) significantly ($p < 0.01$) reduced ulcer index by 51.35% and 75.68% at 250 mg/kg & 500 mg/kg respectively when compared with ulcer control group [30].

Daniele Hermes [a], Débora N. Dudek [a] (2013) perform an experiment on adult male albino Wistar rats to check the anti-ulcer activity of white sweet potato. The result shows that the suspension of tuber flour of white sweet potato prevented ethanol-induced gastric ulceration while crude extracts were able to scavenge free radicals in *in vitro* experiments [31].

ANTICANCER ACTIVITY

Ipomoea batatas has bioactive substances such phenolic compounds, anthocyanins, flavonoids, coumarins, and sterols that make it a promising alternative in the treatment and prevention of cancer. Also, isolated compounds from ipomoea

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batata such as pectin, peptides, and glycoproteins with in vitro and in vivo evidence of anticancer activity [36]. Ipomoea batatas extracts have anticancer and antitumor effects by suppressing proliferation and causing apoptosis in cancer cells [35]. A sixteen-amino-acid peptide IbACP is an anti-cancer peptide of Ipomoea batata isolated from sweet potato leaves, is capable of mediating a rapid alkalinisation of growth media in plant suspension cells [32].

A study conducted by Marcelia Sugata, Chien-Yih Lin, and **Yang-Chia Shih** (2015) shows that the extract of Purple-Fleshed Sweet Potatoes could inhibit the growth of some cancer cell lines, such as gastric cancer (SNU-1), human breast cancer (MCF-7), and colon adenocarcinoma (WiDr), in concentration- and time-dependent manner. Purple-Fleshed Sweet Potatoes (TNG 73) extracts exhibited the capacity to trigger apoptosis in MFC-7 cancer cell line via extrinsic and intrinsic routes after additional examination [34].

A group of researchers also discovered that isolated protein from the sweet potato storage root inhibits human colorectal cancer SW480 cell proliferation, migration, and invasion in a dose- and time-dependent manner [50,51]

A study demonstrated by (Chenfeng Ji, Ziyi Zhang, Baihui Zhang, Jinrui Chen, Rongyu Liu, Dongxue Song, Wenlan Li, Na Lin, Xiang Zou, Jin Wang, Shoudong Guo 2021) shows a dosage-dependent inhibitory effects on human liver HepG2, colonic LOVO and breast \sMCF-7 cell lines, which may partially explain the anti-cancer potential of sweet potatoes. These findings can promote its potential application in foods and pharmaceutical areas [52].

ANTI DIABETIC ACTIVITY

The roots of sweet potatoes have the capacity to lower blood glucose levels. In vivo studies have indicated that different varieties of sweet potatoes can help manage blood sugar levels and minimise insulin resistance. Some research has suggested that sweet potato roots have the capacity to regulate insulin resistance and modulate T2DM-associated genes such as glucose transporter 4 (GLUT4), nuclear respiratory factor 1, myocyte enhancement factor 2A, carnitine palmitoyl transferase 1, and acetyl-CoA carboxylase [109]. Sweet potatoes (Ipomoea batatas) are high in plant proteins and low in calories. In contrast to other starchy root vegetables, it is employed in traditional medicine to treat metabolic problems [54,55]. Sweet potato has significant anti-diabetic properties, and its efficacy has been demonstrated to be greater than that of diabense, a standard diabetes treatment. Adiponectin is a protein hormone that fat cells manufacture. Diabetes patients have reduced levels of adiponectin, and sweet potato extracts have been shown to significantly boost adiponectin levels in type 2 diabetes patients [53]. The juice of ipomoea batata was used to treat diabetic people in Sikkim and Darjeeling [62].

A study conducted by O.O. Ogunrinola, O.O. Fajana, S.N. Olaitan, O.B. Adu **and** M.O. Akinola **(2015) shows that there is** significant decrease in serum glucose concentration of diabetic animals treated with Ipomoea batatas extract compared to treatment with tolbutamide. The possible mechanism by which Ipomoea batatas aqueous extract exerts its hypoglycaemic action is by potentiating the insulin effect, either by increasing pancreatic secretion of insulin from islets of Langerhan's cells or its release from bound insulin, thereby decreasing postprandial glucose in animals [56].

In a study it is proved that ipomoea batatas leaves extract has hypoglycaemic effects due to the presence of saponins in its phytochemical results, which cause a decrease in glucose levels. This might be explained by its stimulatory effects on insulin release and peripheral BG uptake, which reversed the STZ-induced hyperglycaemia [57,58,59].

A study conducted by Rui Zhao, Qingwang Li, Ling Long indicated that ipomoea batatas leaf may be a beneficial antidiabetic natural plant additive, and a dosage of 50 mg kg^{-1} body weight represents the optimal level for effecting a positive NIDDM (non-insulin dependent diabetes mellitus) response in rats [63].

HEPATOPROTECTIVE EFFECT

The hepatoprotective activity of APSPE (anthocyanin-rich purple sweet potato extract) was studied in CCl4-induced Kunming mice. In this in vivo experiment, APSPE significantly reduced the levels of AST, ALT, and MDA in response to CCl4 injuries, while also restoring the activities of defence antioxidant substances SOD and GSH towards normalisation [64].

Anthocyanins protect against hepatotoxic damage primarily by inhibiting lipid peroxidation and scavenging free radicals. Purple sweet potato beverages significantly reduced serum levels of several liver enzymes, specifically gamma-glutamyl transferase (GGT), in healthy males with borderline hepatitis [71,72].

PSPA (purple sweet potato anthocyanins) protected against t-butyl hydroperoxide-induced liver damage, according to Jeong and colleagues, by modulating the expression of redox-associated enzymes or receptors such as heme oxygenase 1 (HO-1), NADPH: quinone oxidoreductase 1 (NQO1), glutathione-S-transferase (GST), and nuclear erythroid 2-related factor 2 (Nrf2) [73,74].

Dark purple sweet potato flakes intake reduced the growth of hepatic lipid peroxide level, furbished the hepatic glutathione level, and regenerated the activities of hepatic glutathione reductase and glutathione S-transferase in male rats given a high-cholesterol diet [75].

The study conducted by (Zi-Feng Zhang, Shao-Hua Fan, Yuan-Lin Zheng 2008) indicated that

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indicated that PSPC (Purple sweet potato colour) has a protective effect against D-gal-induced hepatotoxicity in mice, through attenuating lipid peroxidation, renewing the activities of antioxidant enzymes and alleviating inflammatory response [76].

CARDIOVASCULAR EFFECT

The administration of aqueous sweet potato root extracts including tannin, saponin, flavonoids, terpenoids, alkaloids, anthraquinones, reducing sugar, and cardiac glycosides resulted in a reduction in blood creatine and lactate dehydrogenase activity. The data suggest that sweet potato aqueous root extracts may have a cardioprotective effect [103].

Consumption of sweet potato leaves has been linked to mediating specific physiological responses that may reduce the chances of CVD. Sweet potato leaves have been shown to reduce lipid peroxidation and DNA damage, enhance bile acid excretion in the feces, and regulate blood glucose, plasma insulin levels, and lipid profiles [77,78,79]. Sweet potato leaves have linoleic to α-linolenic fatty acid ratio of around 1:2, which may protect the cardiovascular system from excessive inflammation and oxidative damage [80].

It has been proposed that the dietary fibre included in sweet potato leaves may aid in the enhanced excretion of bile acids and cholesterol, hence decreasing blood cholesterol levels and minimising the risks associated with the development and progression of cardiovascular illnesses [81].

In hamsters, ingestion of sweet potato leaves resulted in more positive biomarkers that signal lower illness risk when compared to other diets (i.e., significantly lower plasma total cholesterol, triglycerides, VLDL-C, LDL-C, and higher HDL-C) [82].

A randomised controlled clinical trial on 58 people revealed a reduction in circulating cholesterol (7 mg/dL) and triglycerides (2 mg/dL) after consuming 132 g of white SP as a meal replacement [83] by inducing vascular (aortic) relaxation [84] mediated by nitric oxide (NO) as an inhibitor, in the presence of N-nitro-l-arginine (NOLA), an inhibitor nitric oxide synthase (NOS), or by eliminating it from the endothelium [85,86].

ANTI-INFLAMMATORY PROPERTIES

Purple-fleshed sweet potato (PFSP) Tainung 73 contains a high concentration of antioxidative components such as phenolics, flavonoid, and anthocyanin. Cyanidin or peonidin and its acylated derivatives are the most common anthocyanins. PFSP extracts shown potential anti-inflammatory action. In LPS-induced macrophage cells, anthocyanin-rich extracts of PFSP TNG 73 may decrease the synthesis of nitric oxide (NO) and certain proinflammatory cytokines, including NFκ-β, TNF-α, and IL-6 [88].

A study conducted by Hyun-Dong Cho, Cindi Brownmiller (2021) identified that SPL (sweet potato leaves) substantially inhibited LPS (lipopolysaccharide) induced inflammation in macrophages by inhibiting iNOS production and the NF-κB signalling pathway [89].

In a study it was found that an ethanol extract of steamed OFSP (Orange-fleshed sweet potato) suppressed the synthesis and expression of many pro-inflammatory mediators via reducing MAPKs and IκB activation on an LPS-induced murine macrophage cell line. These findings clearly revealed that OFSP (Orange-fleshed sweet potato) had anti-inflammatory properties and that continuous intake of OFSP may minimise the risk of inflammatory disorders [90].

In a group of LPS-stimulated mice, purple sweet potato colour extract suppressed proinflammatory molecules by inhibiting phosphorylated extracellular signal-regulated kinase (ERK), phosphorylated c-Jun n terminal kinase (JNK), and nuclear factor kappa B (NF-kB) activation [91,92].

IMMUNE SYSTEM EFFECTS

PSPP-1 (purple sweet potato polysaccharide) has an immunostimulatory impact on RAW264.7 cells, as proven by its capacity to promote proliferation and the cell cycle, improve phagocytosis, and upregulate NO, ROS, and cytokines of IL1β, IL-6, TNF-α, and INF-β [93].

SPG-1 (sweet potato glycoprotein) boosted serum lysozyme activity and T cell immunological response in a dose-dependent manner. The protein part of SPG-1 was altered by pepsin, trypsin, and acetylation treatments, resulting in an increase or moderate decrease in its immunological activity [94].

Purified sweet potato polysaccharide (PSPP) extracted from the roots served as a biological response modulator in a mouse model. PSPP (50, 150, and 250 mg/kg body weight for 7 days) boosted phagocytic function, hemolytic activity, and serum immunoglobulin (IgG) concentrations in mice in a dose-dependent manner [95,96].

ANTIMICROBIAL ACTIVITY

The antimicrobial activity of sweet potato Ipomoea batatas leaves was tested against Gram positive and Gram-negative bacteria, with Gram negative strains displaying a greater inhibition zone. Hexane and methanol extract of sweet potato leaves has shown highest activity against Klebsiella sp. In comparison to hexane extract, methanol extract has shown better antimicrobial activity [97].

The antimicrobial activity of the plant's crude extract of the leaves was investigated using agar disk and agar well diffusion test. To generate 5%, 10%, and 15% sample solutions, the freeze dried extract of sweet potato leaf was diluted in an aqueous solution of 50% (v/v) dimethyl sulfoxide (DMSO). In both agar disk and agar well diffusion tests, these solutions were unable to prevent the growth of Streptococcus mutans, S. mitis, Staphylococcus aureus, and Candida albicans [98,99].

Sweet potato lyophilized leaf powder inhibited the development of Gram positive and Gram-negative microorganisms. The antibacterial extract of the leaves had no influence on the growth of five species of bifidobacteria that are beneficial to human health. According to the findings, one of the antibacterial components might be a pectin-like molecule. There were significant correlations between bacterial growth and pectin like material(s) in sweet potato leaves, which are modified by growing circumstances [100].

CONCLUSION

Sweet potato is an exceedingly adaptable food that is highly healthful for both children and adults. Ipomoea plants have long been used in folk medicine to treat a wide range of pathological problems including inflammatory and algesic processes, renal illnesses, constipation, colic, digestive issues, asthma, bug bites, burns, ciguatera, diarrhoea, dyslactea, fever, nausea. They are rich sources of dietary fibres, protein, vitamins and minerals. This review highlights the important pharmacological activities of sweet potato such as anti-cancer, antioxidant, antidiabetic, and anti-inflammatory, antiulcer, hepatoprotective, cardiovascular, antimicrobial activity. This study provides an update based on the most recent research on the nutritional value, phytochemical content, and health benefits of sweet potatoes. Sweet potatoes include a number of elements capable of enhancing health and avoiding lifestyle-related disorders, in addition to their favourable nutritional content (roots and leaves). Scientific interest of the Ipomoea genus has risen significantly in recent years. As a result, it has the potential to be used as a therapy agent for a variety of disorders in the near future. Comprehensive toxicological studies should be carried out to assess the safety of sweet potato's bioactive ingredients. This will increase research interest in enhancing sweet potato's medical potential beyond its significance in food supply.

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CONFLICT OF INTEREST

No conflict of interest associated with this work.

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