Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 04, Issue: 05 (SEP-OCT, 2024)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Insulin Plant (*Costus igneus*)

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This plant, which belongs to the Costaceae family and was recently brought to India from South and Central America, is called Spiral Flag (Costus igneus Nak and Costus pictus D. Don). It's an eye-catching perennial with spiral-arranged leaves and spreading, upright growth that can grow up to two feet tall. Typically grown as a decorative plant in southern India, its leaves are used with food to cure diabetes mellitus. Many studies have recently been conducted to assess this plant's potential as an anti-diabetic agent. It also possesses a number of pharmacological effects that have been demonstrated, including antioxidant, diuretic, hypolipidemic, anti-microbial, and anti-cancerous properties.

Key words : Insulin, Ameliorative effect, phytochemical properties

Introduction

Costus, commonly known as canna lily or spiral ginger, is a genus of tropical plants belonging to the family Costaceae. Native to Central and South America, Africa, and Southeast Asia, these rhizomatous perennial plants are renowned for their vibrant, spiral-arranged leaves and striking, funnel-shaped flowers. Costus species, such as Costus barbatus and Costus speciosus, have been used in traditional medicine for centuries, particularly for their anti-inflammatory and antioxidant properties. With over 100 species, Costus plants are popular ornamentals in tropical gardens, adding a pop of color and texture to landscapes. Their adaptability to various environments and low-maintenance requirements make them a favorite among gardeners and botanists alike.

Morphology of costus

morphological It is a spreading, perennial plant that grows to a height of about two feet, with the tallest stems toppling over and resting on the ground. Simple, alternating, whole, oblong, evergreen leaves with parallel venation measure 4 to 8 inches in length. This tropical evergreen forms aesthetically pleasing, arching clusters from subterranean rootstocks with its huge, smooth, dark green leaves that have light purple undersides clustered around stems. During the summer months, gorgeous 1.5-inch-diameter orange blooms are produced and appear on cone-shaped heads at the tops of branches. The fruits are green, less than 0.5 inches, unassuming, and not ostentatious.

Development and spread

In full sun or little shade, spiral flags can grow. Plants near water are commonly grown, and it requires rich soil with enough of moisture. Cuttings, clump division, or splitting offsets, or plantlets, that emerge beneath the flower heads are the methods used for propagation. In particular on light, sandy soil, mites and nematodes might be an issue. Diseases that pose a serious threat to the plant are absent.

Phytochemical Study

After conducting a series of screenings for phytochemicals, it was shown that the leaves of C. igneus are abundant in protein, iron, and antioxidant elements such ascorbic acid, α-tocopherol, β-carotene, terpinoids, steroids, and flavonoids. Methanolic extract was found to contain the greatest concentration of various phytochemicals, including proteins, carbohydrates, triterpenoids, alkaloids, tannins, saponins, and flavonoids, in a different study. The leaves of the insulin plant contain 21.2% fibers, according to a preliminary phytochemical analysis. Following extractions yielded extractives in petroleum ether (5.2%), cyclohexane (1.06%), acetone (1.33%), and ethanol (2.95%).

Ameliorative Effect

Steroids were present in every extract, according to an analysis of subsequent extracts. Alkaloid was also present in the ethanol extract. Other than α-tocopherol and ergastanol, a steroid, bis (2'-ethylhexyl)-1,2-benzenedicarboxylate made up the majority of the ether fraction (59.04%).A terpenoid molecule called lupeol and a steroid substance called stigmasterol were found in the stem .From the rhizome of C. igneus, two bioactive substances were isolated: diosgenin, a steroidal sapogenin, and quercetin.The leaves and rhizomes of C. pictus contain notable levels of K, Ca, Cr, Mn, Cu, and Zn, according to trace elemental analysis After C. pictus D. Don's stems, leaves, and rhizomes were steam-distilled, clear, yellowish essential oils were produced. antimicrobial properties Maximum antibacterial activity against gram-negative strains of Salmonella typhimurium, Pseudomonas aeruginosa, Escherichia coli, Enterobacter aerogenes, and Pseudomonas cerus, Bacillus megaterium, Micrococcus leuteus, Staphylococcus aureus, and Streptococcus lactis was demonstrated by the methanolic . When tested against Staphylococcus aureus, Eschericia coli, and Candida albicans, the isolated component from the ethanolic extract of Costus igneus exhibited modest anti-bacterial and anti-fungal action. At 150 µg/ml, the methanolic extracts of the stem and flower of C. pictus showed the highest inhibitory activity against the growth of the tested microorganisms, which included Shigella flexneri, Klebsiella pneumonia, Bacillus subtilis, and Escherichia coli.

Improvement in quality

An investigation was carried out to assess the protective impact of an ethanolic extract of rhizome (50 mg/kg b.wt, orally) on mitochondrial enzymes in male albino rats that were exposed to alcohol-induced free radical poisoning. The restoration of normal levels of mitochondrial enzymes after a 21-day treatment period demonstrated that C. pictus enhanced mitochondrial activities during alcohol-induced free radical stress.

Anti-cancer impact

In in vitro mammalian fibrosarcoma (HT-1080) cells, the ethanolic extract of C. pictus leaves was shown to possess anti-proliferative and anti-cancer properties. Bark extracts exhibited strong anti-tumor effects on A549 and HT 29 cells.

Possible actions

The stimulation of the formation of calcium oxalate dehydrate (COD) crystals confirmed the putative activity of the aqueous extract of Costus stem and its isolated compounds, stigmasterol and lupeol, which inhibited calcium oxalate urolithiasis. This putative activity may potentially treat urinary stones by preventing the formation of calcium oxalate monohydrate (COM) crystals.

Conclusion

The review provides evidence in favor of the leaves' potential therapeutic use in diabetes. Clinical trials must, however, assess and validate these findings further. Its leaves are

presently being investigated on diabetic patients for its anti-diabetic properties. Research reveals how it functions in a number of disorders, which creates new avenues for clinical study. It also opens up new possibilities for researching the substances causing these therapeutic effects and the manner in which they work.