



REVIEW ON PHARMACOLOGICAL ACTIVITIES OF INSULIN PLANT (COSTUS IGNEUS NAK)

Pharmaceutical

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ABSTRACT

Costus igneus a herbaceous plant (Costaceae) specially used in south India to treat Diabetes mellitus and also considered as an ornamental plant in various parts of the world. It is a perennial, upright, spreading plant reaching about two feet tall, with spirally arranged leaves and attractive flowers. Recently, a number of researches have been carried out to evaluate the anti-diabetic potential of this plant. Besides, it has been proven to possess various pharmacological activities like hypolipidemic, diuretic, antioxidant, anti-microbial, anti-cancerous. Further, various phytochemical investigations reveal the presence of carbohydrates, triterpenoids, proteins, alkaloids, tannins, saponins, flavonoids, steroid, and appreciable amounts of trace elements. This work is an attempt to compile and explore the different pharmacological and phytochemical studies of Insulin plant.

KEYWORDS

Costus igneus Nak, Diabetes mellitus, Insulin plant.

INTRODUCTION:

Number of plants has been utilized for treatment of various disease. Since many years *Costus igneus* a herbaceous plant (Costaceae) specially used in south India to treat Diabetes and also considered as an ornamental plant in various parts of the world.[4] This plant was initially grown in America and is now becoming popular in india beacues of its medecinal properties.

Costus igneus is also mentioned in Allopathic and siddha system of medicine for its therapeutic potential such as to longevity , treats skin rash, fever, asthma, bronchitis, and to eliminates intestinal worms .

The family Costaceae consists of four genera and approximately 200 species , the genus *Costus* is the largest in the family with about 150 species that are mainly tropical in distribution. *Costus igneus* commonly known as the insulin plant has been used over the years in the treatment of diabetes specifically type 2 diabetes. It is used in India to control diabetes, and it is known that diabetic people eat one leaf daily to keep their blood glucose low[6]

Antimicrobial properties of medicinal plants are being increasingly reported from different parts of the world. The WHO estimates that plant extracts or their active constituents are used as a folk medicine in traditional therapies in 80% of the world's population. Investigation on new oral hypoglycaemic compounds from medicinal plants will set a milestone for the development of pharmaceutical entities[4].

Pharmacological Activities:

This plant has been proven to posses various Pharmacological activities on Antimicrobial, anti cancerous, Antidiabetic and antioxidant.

Anti-Diabetic Effects:

Costus igneus is a traditionally used medicinal plant and a common member of ornamental plants in south Indian Gardens. Leaves are the important part which produces significant antidiabetic activity. It reduces fasting as well as postprandial blood glucose levels. But the exact mechanism of action behind the antidiabetic activity is not known yet. Along with the antidiabetic activity, insulin plant also reduces the diabetic associated complications; bring renal, hepatic parameters to a controlled level, decreases the amount of glycosylated haemoglobin, corrects the lipid profile, increases body weight as well as insulin level and shows marked improvement in the histopathological examination[1].

Antioxidant Activity:

Ramya Urs S.K* et al.,(2015) studied the effect of Methanol extract on antioxidant activity against *Klebsiella Oxytoca*, *Pseudomonas Fragi*, *Enterobacter aerogens* using various concentrations ranging from 100

µg/mL - 500 µg/mL. The antioxidant and radical scavenging activities of *Costus igneus* were assessed both Stem extract and Root extract. Root extract showed a high inhibition rate than stem extract. And among the stem and root extracts of *Costus igneus*, the total phenolic contents were found to be greater for roots extracts rather than the stem. Root extract also possesses a high amount of vitamin E. Flavonoids with a certain structure and hydroxyl position in the molecule can act as proton donating and show radical scavenging activity. It was evident from the study that the polyphenols and antioxidants not only scavenge off the free radicals but also inhibits the generation of the free radical [2].

Antimicrobial Activity:

Methanolic extract of *C. igneus* showed maximum anti-bacterial activity against gram-positive *Bacillus cerus*, *Bacillus megaterium*, *Micrococcus leuteus*, *Staphylococcus aureus*, *Streptococcus lactis*, and gram-negative strains *Pseudomonas aeruginosa*, *Escherichia coli*, *Enterobacter aerogenes*, *Klebsiella pneumoniae*, and *Salmonella typhimurium*. The isolated compound from the ethanolic extract of *Costus igneus* showed moderate anti-bacterial and anti-fungal activity against *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans* [3].

Urinary stones influenced by *Costus igneus*.

In this study authors have used aqueous extract of leaves, rhizomes, stems of *C. igneus* and they found extract was capable to promote the formation of Calcium oxalate dehydrate (COD) crystals and reduce the nucleation rate of Calcium oxalate monohydrate (COM) crystals.

Antilithiatic

Lithiasis is the disease of urinary system where urinary calculus is formed in the kidney and urinary tract. Numerous medicinal plants have been reported for the management of renal stone so far. Aqueous and ethanolic extract of *Costus igneus* (stem) were found significant in decreasing the calcium and oxalate level [4].

Antioxidant

Ethanolic extract of *C. igneus* rhizome at 200mg/kg was orally administered to diabetic rats for 30 days showed a significant antioxidant effect. Antioxidant potential of ethanolic extract of leaves was found significantly effective by reducing glutathione and super oxide dismutase [5].

CONCLUSION:

This review supports the various therapeutic potential of *Costus igneus*. The insulin plant is the source of various phytochemicals and can used to treat various diseases like diabetes mellitus, urinary stones etc. Studies reveal it's various pharmacological activities like antidiabetic effect, antimicrobial activity, antiurolithiatic property,

anti-inflammatory potential, antioxidant activity, hypolipidemic activity etc. . However these result have to be further evaluated by clinical trial for the welfare of mankind in future.

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