

Review Article

# Phytoconstituents, Pharmacological Activities and traditional uses of *Costus Igneus*, (Insulin Plant): Exploring its Medicinal Potential

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**Abstract:** *The Costus igneus, also called the insulin plant and found in Southeast Asia, has been used medicinally for a very long time. The plant was very recently brought to India, where it is grown as an attractive plant in south India. The insulin plant has a variety of phytochemical elements, including as steroid, alkaloid, flavonoid, triterpene, glycoside, and saponins. In the US, its leaves are consumed as a dietary supplement. diabetes type 2 therapy. The plant's tagline is "A leaf a day keeps diabetes away". different pharmaceutical the effects on learning and memory, antioxidant activity, neuroprotective function, hypolipidemic function, anti-diabetic effect, anti-proliferative potential, anti-microbial, anti-urolithiatic property, anti-inflammatory potential, etc. are just a few of the activities. In order to develop a workable formula for human health in the future, the current review paper aims to investigate the many medicinal properties of the Costus igneus (insulin plant).*

**Key words:** *Costus igneus, Insulin plant, Leaf, Phytoconstituents, and Ayurvedic use, Pharmacological activities, Marketed products.*

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INTRODUCTION:

India refers to *Costus*, a plant in the *Costaceae* family, as the "insulin plant" because its leaves help the human body produce insulin<sup>1</sup>. There is a growing need for herbal remedies to treat diabetes mellitus because oral hypoglycaemic medications have a number of side effects. Numerous plant-based remedies are employed in traditional medicine and folklore to treat diabetes mellitus. Future studies on novel oral hypoglycaemic compounds from medicinal plants will open the door to the development of pharmaceutical entities or dietary supplements to existing treatments [1].

The insulin plant is one such traditional plant that is rapidly gaining popularity on a global scale and is now widely used as an ayurvedic medicinal herb. Diabetics who consumed the leaves reported observing a decrease in their blood sugar levels, which is expected to lower blood glucose levels. The insulin plant was first developed in Southeast Asia, namely on Indonesia's Greater Sunda Islands. It is a fairly recent import to India and is used as an ornamental plant in Kerala [2]. The Ayurvedic medical system advises eating plant leaves for a month in order to control diabetes and maintain blood glucose balance [1].

Plant Specifics

The perennial, tall, tropical evergreen plant known as *Costus igneus* N.E. Br. belongs to the *Costaceae* family and has simple, alternate, entire, oblong, evergreen leaves with parallel venation that range in length from 4 to 8 inches. Large, smooth, dark green leaves with pale purple undersides grow in beautiful, arching bunches from underground rootstocks. Around stems, the leaves are arranged spiral-style. Up to a height of around 60 cm, at which time the tallest stems fall over and lie on the ground, the plant reaches its maximum height. In the summer months, lovely orange blooms with a diameter of 2.5 to 12.5 cm appear on cone-shaped heads at the tips of branches<sup>2</sup>. Stem cuttings are used to multiply the insulin plant [3, 4].

**Common names:** Fiery *Costus*, Spiral flag, Insulin plant, Step ladder<sup>3</sup>

Table 1: Vernacular names

Languages	Names
English	Spiral Ginger, Spotted Spiral Ginger, Painted Spiral Ginger

Telugu	Peddavesiga, Yeangesha
Urdu	Bijasar, Dam al akhwain
Bengali	Piasal
Hindi	Banda, Bija-sal, Peisar, jarul, Keukand
Kannada	Kempu honne
Malayalam	Honne, Karintakara, Vengai, Venna-maram
Marathi	Honi, Pushkarmula
Sanskrit	Asana, Bandhukapushpa
Tamil	Neyccarikamaram, Venkai-c-ciray, Kostam
Gujarati	Pakarmula

**Table 2: Taxonomic position [5]**

Botanical name	<i>Costus igneus</i>
Domain	Eukaryota
Kingdom	Plantae
Subking dom	Viridiaeplantae
Phylum	Tracheophyta
Subphylum	Euphylophitina
Infraphylum	Radiotopses
Class	Liliopsida
Subclass	Commelinidae
Superorder	Zingiberane
Order	Zingiberales
Family	Costaceae
Subfamily	Asteroideae
Tribe	Coriopsidae
Genus	Costus
Specific epithet	igneus

#### Phytoconstituents

Preliminary screening of methanolic extracts from wild plants and calluses (MS and LS medium) revealed high levels of phenols, alkaloids, flavonoids, and terpenoids; phytochemical analysis revealed the presence of steroids, triterpenoids, alkaloids, tannins, flavonoids, glycosides, saponins, carbohydrates, and proteins. The most phytochemicals were discovered in the methanol extract [6].

**Table 3: nutrient composition of the sample after drying**

Moisture	4.0%
Fat	2.8%
Total ash	6.3%
Protein	18%
Iron	40mg
Phosphorous	6.6mg
Calcium	5.1mg
Total phenols	4.4g
Total flavonoids	0.848mg/g
B-carotene	667µg
A-tocopherol	149mg
Ascorbic acid	81mg
Glutathione (GSH)	75mmol

#### Medicinal Use in Ayurvedic System

##### Leaves:

Patients with diabetes must chew on the leaves of the insulin plant for one month. In other words, the patient must take two breaks per day—one in the morning and one in the evening—during the course of a week. Before eating the leaves, take care to chew them completely. The patient should then consume one leaf each morning and night for the following week. This dosage needs to be consumed every day for 30 days [7]

Allopathic doctors, who have been proved to be successful in bringing blood sugar levels completely under control, also recommend doing this. The insulin plant's catchphrase is "A leaf a day keeps diabetes away"[1].

##### Rhizomes

The rhizome of the insulin plant is thought to have a number of medicinal properties, including those of bitterness, astringency, acidity, cooling, aphrodisiac, purgative, anthelmintic, depurative, febrifuge, and expectorant. It can also be used to treat anaemia, burning sensations, constipation, leprosy, worm infests, skin conditions, fever, asthma, bronchitis.

#### **Activities Related to Drugs**

Numerous recorded events in the insulin factory have occurred.

Some of these haven't been confirmed yet. In these activities, the various plant parts—including leaves, stems, roots, rhizomes, and the entire plant—are on show. Leaves are a significant source of possible hypoglycaemia. Most studies on the antiurolithiatic activity of the stem. Both the root and the stem have been proven to have significant antioxidant activity.

#### **Anti-Diabetic Effects**

*Costus igneus* is a common ornamental shrub and commonly used medicinal herb in south Indian gardens. The leaves are a key element that has a potent anti-diabetic action. Both before and after meals, it reduces blood sugar levels. The exact mechanism of action causing the antidiabetic benefit is still unknown, though. In addition to its anti-diabetic properties, insulin also enhances histopathological analysis, regulates renal and hepatic parameters, reduces the amount of glycosylated haemoglobin, improves the lipid profile, raises body weight and insulin levels, and reduces complications related to diabetes [9]

#### **Anti-cancer effects:**

It was discovered that in vitro mammalian fibrosarcoma (HT-1080) cells treated with an ethanolic extract of *C. pictus* leaves exhibited anti-proliferative and anti-cancer effect [1]. In tests using HT 29 and A549 cells, all bark extracts shown strong anti-cancer effects.

#### **CONCLUSION:**

The review supports the leaves' potential as a therapeutic treatment for diabetes. However, in order to validate and further examine these findings, clinical studies must be used. The leaves' ability to prevent diabetes is currently being examined in patients who have the disease. Its role in many disorders is revealed by research, opening up new avenues for therapeutic inquiry. It also creates new avenues for researching the compounds responsible for these therapeutic benefits and understanding their mechanisms.

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