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## **Review Article**

# A Review On Phytochemical Constituents And Medicinal Values Of "Cheilocostus Speciosus"

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#### ABSTRACT

*Cheilocostus Speciosus* is a plant in the family Asteraceae It is widespread to Southeast Asia and adjacent regions, ranging from India to China to Queensland. It is particularly prevalent on Indonesia's Greater Sunda Islands. Puerto Rico, Mauritius, Reunion, Fiji, Hawaii, Costa Rica, Belize, Melanesia, Micronesia, and the West Indies are also said to have naturalised. This review includes the Plant profile, major constituents, Chemical test, and the pharmacological activities of *Cheilocostus Speciosus*. The main constituents of the plant were diosgenin, curcumin, and curcuminoids. Costus tubers and roots include 5-stigmasten-3b-ol, sitosterol--D-glucoside, dioscin, prosapogenins A and B of dioscin, gracillin and quinines. Saponins have also been reported from rhizomes, including seeds and roots. Which shows pharmacological activity, Anti-diabetic activity, Antimicrobial activity, and others. The rhizome extract is used as a tonic and is beneficial in the treatment of burning sensations, constipation, leprosy, asthma, bronchitis, anaemia, and various skin problems. Costus rhizomes are used as a herbal fever treatment.

## **INTRODUCTION**

Many countries of the world, including India, are rapidly losing traditional knowledge of herbal medicines for treating human ailments. Nowadays, tribals and indigenous groups in India use herbal medicine to treat a wide range of ailments and disorders. They collect and preserve plant species that are locally available, wild, or cultivated. The research area has no prior records of ethnomedical knowledge. As a result, an effort has been made to chronicle plant species, medicinal formulations, and disease treatment by various communities living in this area[1]. Speciosus is among the most effective Islamic traditional medicinal plants[2]. Cheilocostus speciosus, or crêpe ginger, is a species of flowering plant in the family Costaceae.

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Sub-class

Order

It is widespread to Southeast Asia and adjacent regions, ranging from India to China to Queensland. It is particularly prevalent on Indonesia's Greater Sunda Islands. Puerto Rico, Mauritius, Réunion, Fiji, Hawaii, Costa Rica, Belize, Melanesia, Micronesia, and the West Indies are also said to have naturalised. It is extensively grown as an ornamental[3]. These plants have been known to demonstrate pharmacological activities such as antiinflammatory, anti-microbial, antioxidant, antidyslipidemic and anti-cancer. The plant is also recognised to be abundant in antioxidants such ascorbic acid, carotene, tecophenol, glutathione, phenol, and flavonoids. The seeds include two novel quinones, di-hydrophytic plastoquinone and its methyl derivatives, as well as tocopherol[4].

#### **Plant profile:**

*Cheilocostus speciosus*, is a species of flowering plant in the family Costaceae

| Vernacular | names: |
|------------|--------|
|------------|--------|

| Assam     | Tara                       |
|-----------|----------------------------|
| Bengali   | Keu, Keumut                |
| Kannada   | Changalvakostu, Chikke     |
| Malayalam | Channakoova                |
| Marathi   | Penva, Pinnha, Kobee, Peva |
| Tamil     | Kostam                     |
| Sanskrit  | Kembuka, Kebuka, Kembu     |
| Telegu    | Kashmeeramu, Cengalvakostu |
| Classical | Kebuka                     |
| name      |                            |
| English   | Crepe ginger               |
| Guajarati | Paskarmula, Valakdi        |

| Hindi                              | Keu, K           | leukand, Kemuka, Kemua |  |
|------------------------------------|------------------|------------------------|--|
| Latin name                         | Costus speciosus |                        |  |
| <b>Faxonomical classification:</b> |                  |                        |  |
| Kingdom                            |                  | Plantae                |  |
| Sub-kingdom                        | ı                | Tracheobionta          |  |
| Super divisio                      | n                | Spermatophyta          |  |
| Division                           |                  | Magnoliophyta          |  |
| Class                              |                  | Liliopsida             |  |

Zingiberidae

Zingiberales







[FIGs: Plant phenotypes of Costus speciosus: a) growing plantlet; b) young plant at initial developmental stage; c) small plant with young leaves; d) plant showing vegetative stage; e)-h) flowering stages; i) plants bearing flowers in dense vegetation; j) single plant showing all plant parts; k) plant rhizome with small peripheral roots.]

## **DISTRIBUTION:**

Costusspeciosus is a species native to Southeast Asia's Malay Peninsula. The plant naturally occurs in the Sub-Himalayan region, sections of central India, and the Western Ghats of Maharashtra and Karnataka in addition to Kerala [5]. The Costus genus contains around 100 different species. Flower colour varies between Costus species. Some flower and bract kinds resemble compact cones, whilst others resemble pineapples or soft crepes emerging from green cones. India is home to approximately seven species of the genus Costus C.barbatus, Linn. C.chartaceus, C.cuspidatus, C.giganteus, C.igneus, C.osae, and C.spectabilis are other cultivated species of this genus.

## **CHEMICAL CONSTITUENTS:**

The rhizomes are the primary source of diosgenin. The main chemical ingredients are diosgenin, curcumin, and curcuminoids. Costus tubers and roots include 5-stigmasten-3b-ol, sitosterol--D- glucoside, dioscin, prosapogenins A and B of dioscin, gracillin, and quinines [6]. Saponins have also been reported from rhizomes, including seeds and roots. Saponins extracted from seeds have been reported to have hypotensive and spasmolytic properties. Tigogenin and diosgenin (2.6%) have isolated from been rhizomes[7]. Various chemicals such as -amyrinsterate, -amyrin, and lupeolPalmitates were isolated from the leaves [8]. Two novel quinones, dihydrophytylplastoquinone and its 6-methyl derivatives, and tocopherol were Tetradecyl isolated from seeds [9]. 13methylpentadecanoate, tetradecyl 11methyltridecanoate, 14-oxotricosanoic acid, 14oxoheptacosanoic acid, and 15-oxooctacosanoic acid have been isolated from rhizomes [10]. Palmitic acid (55.97%), oleic acid (23.75%), linoleic, stearic, myristic, and lauric acids are all present in seed oil (6.0%). Defatted seeds included diosgenin, glucose, galactose, and rhamnose. The roots yielded 31-norcycloartanone, cycloartanol,



cycloartenol, and cyclolaudenol[11]. Methyl 3-(4hydroxyphenyl)-2E propenoate was extracted from rhizomes [12].

## CULTIVATION

C. speciosus is typically grown on fertile, organic, wet, well-drained soils in the shade [13]. It grows best in tropical climates with high humidity and minimum temperatures of 130 C. The thick fleshy roots known as "rhizomes" are the source of pancake ginger's growth. Under optimal growing conditions, a single rhizome can produce new shoots and grow to form a 3 ft broad clump in the second year. Costus reproduces naturally by rhizomes, culm division, and stem cuttings. It can also be cultivated from seeds. Birds share costus seeds as they feast on the fruits.

## **MEDICINAL PROPERTIES**

The bitter rhizomes have anthelmintic, astringent, and expectorant effects. [14] [15] [16] .mThe rhizome extract is used as a tonic and is beneficial in the treatment of burning sensations, constipation, leprosy, asthma, bronchitis, anaemia, and various skin problems [17]. Costus rhizomes are used as a herbal fever treatment. C.speciosus rhizome exhibits hepatoprotective effects [18]. Rhizome paste is used to cure boils as well as to manufacture sexual hormones and contraceptives [19]. Scabies and stomach disorders are treated with the leaves. Stems are ground into a paste and used to treat blisters.Snake bites are treated using rhizome extract. [20] [21] [22].C.speciosus has been used as a medical herb for centuries, primarily for its stimulant, carminative, diuretic, digestive, and antibacterial characteristics.

## **OTHER USES**

Southeast Asia C. speciosus is a food plant. Vegetables include tender young branches, fruits, and rhizome.

## PHARMACOLOGY

It contains several different kinds of C. speciosus activities. A figure depicts several activities.



## Anticancer activity:

C. speciosus preparations in methanol and ethyl acetate shown antitumor activity. Baskar et al. (2012) discovered that C. speciosus had antioxidant and antipoliferative properties against a human colon cancer cell line (COLO 320DM).

Costunolide was discovered to be involved in the arrest of human breast cancer (MDA-MB-231) cells at the G2/M phase of the cell cycle. Another chemical, diosgenin, has been shown to suppress the growth of hepatocellular carcinoma (HepG2) cells.[23]



## Anti-inflammatory:

Using adult albino rats and Swiss albino mice, methanolic extracts of aerial portions of Costus speciosus (400 and 800 mg/kg BW) shown antiinflammatory, analgesic, and antipyretic effects (Srivastava et al., 2013). The anti-inflammatory efficacy of methanol extract was tested on rats using the carrageenan-induced paw oedema test. The analgesic effect of C. speciosuson mice was also investigated using acetic acid-induced writhing and Eddy's hot plate methods. This plant's antipyretic activity was tested in rats using Brewer's yeast-induced pyrexia (Srivastava et al., 2013).[24]

## Anti-diabetic activity:

Diabetes mellitus is associated with low insulin levels in the blood, and low insulin levels in the blood induce coronary artery disease. cerebrovascular illness, renal failure. and blindness, all of which can lead to premature death. Costus speciosus is also known as the 'insulin plant' (Daisy et al., 2008)[25], and diosgenin, which is found in the rhizome of C. speciosus, has been utilised as an anti-diabetic medication (Raniet et al., 2012; Sulakshana and Rani, 2014)[26]. An experiment was carried out with petroleum ether, chloroform, methanolic, and aqueous extracts of C. speciosus rhizome to validate the antidiabetic potential. In rats, the extracts (50 mg/kg BW intraperitoneal and 0.6 mg/kg BW glibenclamide, orally) demonstrated promising anti-diabetic activity (Bavarva and Narasimhacharya, 2008; Rajesh et al., 2009; Ali et al., 2014).[27]

## Antimicrobial activity:

Oral administration of antibiotic compounds may result in undesirable side effects; for example, oral administration of penicillin may cause heartburn, nausea, vomiting, and diarrhoea. As a result, various trials on herbs and spices as antibiotic substitutes were done.[28]. In comparison to silver sulfadiazine cream, hexane and methanol extracts of C. speciosus. leaf and rhizomes displayed a lysis zone against Shigella spp., Staphylococcus aureus, Escherichia Klebsiella coli. pneumoniae. Pseudomonas spp., Bacillus subtilis. and Salmonella spp.[29] The antifungal effect of costunolide displayed significant minimal inhibitory concentration values of 62.5 g/ml against Trichophyton mentagrophytes, 62.0 g/ml against Trichophyton simii, 125 g/ml against Epidermophyton floccosum, 31.25 g/ml against Trichophyton rubrum, 125 g/ml against Curvulari lunata, 62.5 g/ml against T. rubrum. Other activitys:

- Hepatoprotective activity.
- Hypolipidemic activity.
- Adaptogenic activity.
- Insecticidal and acaricidal activity.

**CONCLUSION AND FUTURE PROSPECTS:** Cheilocostus Speciosus is a medicinal plant with numerous pharmacological qualities, including anticancer and anti-inflammatory activities. Antidiabetic action, antimicrobial activity, and other activities such as hepatoprotective activity, hypolipidemic activity, adaptogenic activity, insecticidal and acaricidal activity are all examples of its properties. As a result, it has the potential to be a beneficial therapeutic agent for the treatment of a variety of disorders.

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