

An Exclusive Review on *Ceropegia juncea* Roxb.

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Abstract

Nature has abundant source of herbs. Each herb have certain phytoconstituents, that isolated substances are utilized as drug. Through this review distribution, morphology, antimicrobial studies, phytochemistry, pharmacological and micropropagation of *Ceropegia juncea* Roxb. were analysed. 'The steroids, terpenoids, anthocyanins, anthracene glycosides, coumarins, flavonoids, fatty acids, phenolic compounds, alkaloids, carotenoids, tannins, saponins, and carbohydrates, lipids, sugars, potassium, cerapegin, lupeol and stigmasterol' were isolated from preliminary phytochemical analysis. Among these Cerapegin is characteristic found in *Ceropegia juncea* Roxb. Which is capability to curw 'hypotensive, hepatoprotective, antiulcer, antipyretic and also, the coumarin found to be act on anti – coagulant, anti-oxidant, anti – allergic, anti- thrombotic, anti – inflammatory, anti – proliferative, anti-viral, anti- carcinogenic, analgesic activities, cytoprotective and modulatory functions'. The some drink is rich in coumarin and ceroepgin. There were 29 components isolated from *C. juncea* Roxb. This review summarizes the medicinal value of *Ceropegia juncea* Roxb. in both traditional and ayurvedic system.

Plants are nature's gift and few plants have abundant medicinal value. Phytochemicals are used to prepare drug and they were utilized as ayurvedic or traditional medicine. More than 200 species of *Ceropegia* were available and in India consists of 50 species. *Ceropegia* contains a specialized chemical constituent

Ceroepgin¹³. The plant was protected under certain ex-situ condition¹¹. The 'Flora of Madras Presidency'⁶ and Flora of 'Tamil Nadu Carnatic'¹⁵ was used to identify the specimen.

Biological Source :

The *Ceropegia juncea* Roxb. belongs

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to Apocyanaceae.

Synonym :

Rosary vine, necklace vine, Snake creeper, lantern flower, string of hearts, bushman's pipe, wineglass vine⁴.

Classical and common name :

The plant is commonly known *Somalata*.

Vernacular name :

- ❖ Tamil : Pulicha kodi, Velipulichan
- ❖ Hindi : Somalata
- ❖ Malayalam : Somalata, Bhutumbi
- ❖ Sanskrit : Somalata, Somaraji, Soma valli
- ❖ Telugu : Pullakada, Bella-gada²⁵.

Distribution :

Origin and Geographical Distribution :

South – East Asia, Canary Islands, New Guinea, Tropical Arabia, Africa, Mediterranean region and Northern Australia. *Ceropegia juncea* Roxb. is endemic to Western Ghats in India¹⁶ and abundant in margin of Indian ocean²⁴.

Habitat :

Commonly distributed in cultivable land, fence and forest, hills.

Morphology :

Root :

Tuberous root or fascicled roots.

Leaf :

Lanceolate shape¹³ when young later leafless.

Flower :

Goglet shaped borne in umbels¹³, yellow, green, purple and grow in axillary position, incurvate petals, purplish spot, pollenia found⁴. Which have well developed fly-trapping mechanisms and that is known as autogamy¹¹. Pollination is limitation factor for fruit set under certain conditions. The maturation of flower and fruit occurs every year in the month of July – November.

Fruit :

Elongated follicle, seeds flat with tuft of whitish hairs²⁵.

Propagation :

The propagation method of *Ceropegia* members mostly through root tubers and stem cuttings¹⁹.



Ethnobotanical uses of Ceropogia juncea Roxb.:

Ceropogia juncea Roxb. crush material which contain large quantity of natural anti-oxidants, applied in traditional medicine production. The plant which contain potential phytoconstituent used to prepare soma drink and that chemical compounds also cure several diseases²⁸. Cerapegin act as antipyretic, mast-cell stabilizing, tranquilising, hypotensive and used in abdomen and gastro – intestinal problems^{1,2}. The combination of goat milk with crushed stems like *Ceropogia juncea* Roxb. is taken orally for three days to cure disease like ulcer by Paliyan or Paliyar tribe in Sirumalai hills of Southern India¹⁰. The decoction and juice of the Leaves of this plant are used to cure bacterial infection, ulcer and inflammation¹⁶.

RET condition:

The *Ceropogia* species are in threatened condition because of high medicinal value and reduced count in natural habitats. Loss of habitat, climatic condition, less awareness of protecting plants, low seed formation, poor seed germination, animal disturbance, mode of preparation and consumption²⁴.

Phytoconstituents of Ceropogia juncea Roxb. :

The phytochemical screening of *Ceropogia juncea* Roxb. reveals that various phytoconstituents such as carbohydrates, saponins, phenolic compounds, fatty acids, flavonoids, coumarins, anthracene glycosides, anthocyanins, terpenoids, alkaloids, carotenoids, steroids^{23,25&29}, sugars, potassium¹⁷ and lupeol,

stigmasterol were identified through HPTLC method⁵. The GC-MS methanolic extract resulted 29 components and p-(Dimethylamino) benzaldehydeoxime. FTIR exhibited the functional groups of alcohol, aldehyde, alkyne, alkene and amines, except ester are present and peak wavenumber 3354.08cm⁻¹ exhibited O-H Alcohol functional group²⁹.

Cerapegin:

The characteristic phytoconstituent of ceropogia known as cerapegin found to be fraction method¹⁸ and also separated triterpene, lupeol. The Cerapegin - pyridine alkaloid, which is used to prepare soma drink⁸.

Coumarin:

The phytochemical analysis like HPLC and TLC results proved 4-Methyl Coumarin bioactive compound is present in the *C. juncea* Roxb. This compound is peculiar in pharmaceutical industry, which cures different diseases and disorders such as anti-coagulant, hepatoprotective, anti-oxidant, anti-allergic, anti-thrombotic, anti-inflammatory, anti-proliferative, anti-viral, anti-carcinogenic, analgesic activities, cytoprotective and modulatory functions²⁶.

Antimicrobial Activity:

Ceropogia juncea Roxb. extract was analysed with different microbes and the suggestive result of methanolic extract shown in *Klebsiella pneumoniae*, *Escherichia coli* and *Pseudomonas aeruginosa* and lower effect in *Klebsiella pneumoniae* and *Proteus vulgaris* in aqueous extract. The *Candida*

albicans was not shown positive results in all solvent extracts of *C. juncea* Roxb.”³. *C. juncea* inhibits the growth of all the selected bacteria in crude methanol extract and inhibitions zone vary according to the bacterial species. It cures urinary tract infection, urinary disorders and it control the disease causing bacteria like *Escherichia coli* and *Staphylococcus aureus*²⁹. Ceropegin compound does not show any antibacterial activity against a few Gram^{+ve} and Gram^{-ve} organisms were examined⁴.

Pharmacological activities of Ceropegia juncea Roxb:

Acute-toxicity studies:

The biological determination was analysed in the following ratio 100, 200, 300, 400 mg/kg body weight. Toxicity study reveals that animals were safe until maximum dose of 3000 mg/kg body weight. They do not cause any change in physical appearance and without causing poisonous substances, mortality were noticed²³. The toxicity of *C. juncea* made to lower through the sub – acute toxicity and released from their side effects⁴.

Study of Anti-Ulcer and Antioxidant activity using Ethanol-induced Ulcer method:

The ulcer was calculated by using magnifying glass and the circumference of the ulcer was evaluated with vernier caliper. (score 1-5 fixed different ratios). The examined ulcer activity decrease the amount and overall acidity, rise the P^H of gastric fluid. In normal rat contrast to pylorus – ligation was rise lipid peroxidation and reduce SOD, catalase and decreased glutathione in control,

which leads to oxidative stress²³.

Anticancer :

The HCT – 118 (Colon cancer cell) cell line ethyl acetate fraction *C. juncea* extract against anti – cancer activity⁴.

Anti- diabetic :

The both *in- vitro* and *in - vivo* plants *Ceropegia juncea* Roxb. methnolic, ethanolic extracts are analysed with α - amylase and α - Glucosidase enzymes are present in the colon of man. Which support in the breakdown of carbohydrate into starch and oligosaccharides. The suppression process of carbohydrate, which reduce in the sucking and lowering glucose level²².

Antiinflammatory :

Both *in- vitro* and *in – vivo* plant have equal quality and quantity of phytoconstituents. *Ceropegia juncea* Roxb. methnolic, ethanolic extracts of both *in- vitro* and *in - vivo* plants are analysed through albumin denaturation assay and membrane stabilization assay reduces the inflammation²².

Heavy metal analysis:

The *Ceropegia juncea* Roxb. have certain metals like arsenic (0.60 $\mu\text{g/g}$), lead (0.002 $\mu\text{g/g}$), mercury (0.0), cadmium (0.053 $\mu\text{g/g}$), zinc (0.247 $\mu\text{g/g}$), zinc (0.247 $\mu\text{g/g}$), copper (1.637 $\mu\text{g/g}$), manganese (0.017 $\mu\text{g/g}$), chromium (0.036 $\mu\text{g/g}$). These metals are cure many illness under the suggestion of “World

Health Organization” and it is acceptable by human health²⁵.

Free radical scavenging activity:

‘Inhibition of lipid peroxidation made through free radical have redox properties, carboxylic group and conjugated ring structure. Essential defense enzyme SOD helps catalyses the dismutation of superoxide radicals. Administration of CJEE causes significant increase in SOD, Catalase reduced glutathion levels with all doses in comparison to control animals, which suggest its efficacy in preventing free radical induced damage. CJEE has also increased the activities of Na⁺K⁺ Atpase, Ca²⁺ Atpase and Mg²⁺ Atpase (membrane bound enzymes) in both the models’²³.

The *Ceropegia juncea* Roxb. rich in medicinal value, due to over consumption leads rare, endangered and threatened condition. Comparatively in-vitro and in-vivo both species shown similar results in all test. We have to create awareness among people about their medicinal value and propagate *Ceropegia juncea* Roxb. in large quantity helps in vanish endemic condition.

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