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Medicinal profile of *Calycopteris floribunda* Lam: A review

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Abstract

During last several years, there has been growing interest among the usage of various medicinal plants from traditional system of medicine for the treatment of different ailments. Currently plant based drugs are researched and formulated in modern framework in new ways of medicine. *Calycopteris floribunda* Lam. is a large diffuses or scan dent, climbing shrub belongs to the family Combretaceae, locally known as Ukshi. Forest dwellers commonly referred as a lifesaver, these people often use to quench their thirst. The parts of plant being used medicinally for number of complications such as vomiting, jaundice, pruritus, skin diseases, intestinal worms, colic, leprosy, malarial fever, dysentery, ulcers, cytotoxicity, and having anthelmintic, antibacterial and antiviral properties. This article provides an overview of key concepts regarding the pharmacognostical and pharmacological profile of *Calycopteris floribunda*.

Keywords: *Calycopteris floribunda*, Lifesaver, Ukshi, Antibacterial, Antiviral properties.

Introduction

Plants have been used as medicines for thousands of years. People depend on plants for several purposes like for wood, timber, non-timber forest products, food, medicine etc. ^[1]. They have always been used as a rich source of biologically active drugs and have numerous traditional uses to serve mankind for many thousand years ^[2-7]. Now days, they are used widely because of growing awareness of people towards side effects and high cost of the allopathic medicines ^[8-9] which makes them beyond the reach of common people. Ethnobotanical knowledge has been reported from its several parts ^[10-13]. Since ancient time, plant- based product has been used for health care, search is continuing for new plant material and their interaction with biological system.

The different systems of medicinal usage like Ayurveda, homeopathy and Unani which are the local health traditions, focuses on the use of plant products for the treatment of human and animal diseases. Medicinal plants contain numerous biologically active compounds which are helpful in the treatment of various diseases and improving the life. The presence of various life sustaining constituents in plants made scientists to investigate them for their uses in treating certain infectious diseases and treatment of chronic wounds. In addition to being a good source of anti-infective agents, they are also cost-effective and have fewer side effects ^[14-17].

The present review is on *Calycopteris floribunda* Lam. family Combretaceae; commonly called as 'Ukshi' (Marathi). A systematic scientific study has been conducted regarding the efficacy of different plant parts in the treatment of various diseases. There is a need to review the information available in literature on *Calycopteris floribunda* for that it would aid future research by phytochemists, pharmacologists, clinicians, researchers, scientists and toxicologists ^[18-19].

Botany of plant

Plant Distribution and Description

Calycopteris floribunda Lam. family Combretaceae; commonly called as 'Kokkarai' (Hindi). The plant is also grown in central and southern parts of India. It is a large climbing shrub which is 5-10 m long, with vines that are about 5–10 cm in diameter, the stem and leaves are said to have medicinal properties. Ukshi is found extensively in the low-lying tropical evergreen forests of the Western Ghats "Fig. 1" ^[18].

It bears grey bark and tenuous branches with thick fluff on the surface. The leaves are 7 to 12 cm by 4 to 6 cm ovate-lanceolate or elliptic-oblong, acute or acuminate, petiole 0.5 cm to 1.0 cm long; upper surface dull green, lower pale brown with prominent veins, both surfaces hairy; taste, astringent and odour characteristic. New branches are hairy and rust coloured.

The flowers occur in dense clusters at the end of branches. The bracts of the small flowers are ovoid or oval, with thick fluffs on the surface. Petals are absent and the 10 stamens are arranged in 2 cycles [18-21].

The fruit inception bears 1 ventricle and 3 pendulous ovules inside. The fluffy sham-winged fruit, which is about 8 mm long, has 5 edges and 5 persistent calyxes which enlarge into the fluffy wing 10–14 mm in length. The sepals are

prominent, hairy and green. The roots are upto 3 cm. in diameter occasionally with attached rootlets, surface with fine longitudinal wrinkles, buff brown to greyish-brown, bark very thin; fracture, tough and fibrous; taste and odour indistinct. Pieces of stem cylindrical, about 8 to 10 mm thick, surface light brown, smooth; bark thin, easily separable; fracture hard and fibrous; taste and odour indistinct.



Fig 1: A Branch and Whole Plant of *Calycopteris floribunda* Lam

Plant taxonomic status and vernacular name

Taxonomic status “TABLE. I” and vernacular names “TABLE. I” of plant *Calycopteris floribunda* Lam is given in below. [18-21]

Table 1: Taxonomic status of *calycopteris floribunda*

Scientific classification	
Kingdom	Plantae
Clade	Angiosperms
Clade	Eudicots
Clade	Rosids
Order	Myrtales
Family	Combretaceae
Genus	Calycopteris
Species	Calycopteris floribunda

Table 2: Vernacular names of *calycopteris floribunda*

Vernacular names	
Sanskrit	Pullani, Toyavalli, Karavelli
Hindi	Kokkarai
Kannada	Marsadabaguli, Enjarige Kubsa
Malayalam	Pullaani, Varavalli
Marathi	Ukshi, Bogull
Tamil	Minnaarukoti, Pillani, Therulankodl
Telugu	Bandimurududu

Phytochemistry of plant

The phytochemical screening of various extracts of *Calycopteris floribunda* showed the presence of phytosterols, triterpenoids, alkaloids, saponins, flavonoids, tannins, calycoptrin, quercetin and five biflavonoids from the leaves and flowers. Other chemical compounds like Octacesanol, sitosterol, calycopterin, 3’O-Methylcalycopterin, 4-O methylcalycopterin, ellagic acid quercetin and proanthocyanidin [21-24].

Scope of review

The review of *Calycopteris floribunda* is predominantly needed to answer the gaps between ethnomedicinal uses and

phyto studies. An attempt has been made to provide the complete information on ethnomedicinal uses and phytochemistry of the plant, so that it would aid in future research on this species by phytochemists, pharmacologists, scientists, researchers and toxicologists etc. The review highlighted the ethnobotanical uses (Table1) of various parts of the plant to provide a comprehensive idea to the readers.

Ethnobotanical uses

Calycopteris floribunda is one of the plant species with potential medicinal properties. The whole plant and different parts of the plant are used to cure many human ailments. Ukshi or Pullani. It is commonly referred as a lifesaver by the forest dwellers. During summer period the vine stores water which people often use to quench their thirst. The plant parts especially leaves being used medicinally for various complications such as intestinal worms, colic, leprosy, malarial fever, dysentery, ulcers and vomiting. The fruits are useful in jaundice, ulcers, pruritus and skin diseases.

A number of phenolic and non-phenolic flavonoids including cytotoxic, anthelmintic and antiviral properties have been isolated from the plant. The tender copper coloured leaves ground into paste or dry powders administered for the expulsion of bacteria, free radicals and round worms [25-28]. According to Nadkarni, the extract of leaves exhibits the colour reactions of santonin. Sreekanth et.al, (2007) done their studies on leaf extracts of *Calycopteris floribunda* revealed that the extracts were toxic to calf, rabbits and rats [29]. The leaves are reported to have medicinal uses as a laxative and anthelmintic medicine, while the juice derived from the young twigs is used for the treatment of diarrhoea, dysentery and malaria [30]. Fruits are used to treat jaundice; flowers are reported as anti-tumour agent.

Table 3: Ethnomedicinal profile of *calycopteris floribunda* lam

Sr. No.	Plant Part Used	Ethnomedicinal Uses
1	Flowers	Wounds healing, Anti-tumour agent
2	Fruits	Jaundice, Ulcers, Pruritus and Skin diseases, Leprosy
3	Leaves	Lifesaver, Intestinal worms, Colic, Leprosy, Malarial fever, Dysentery, Ulcers and Vomiting, Skin diseases Anthelmintic, Antiviral
4	Stems	Malarial fever, Dysentery, Anthelmintic, Antiviral
5	Roots	Demulcent, diuretic, Anthelmintic, Antiviral, Wounds healing

Pharmacological potentials

Bhat *et al.*; reported antimicrobial activity of the leaves of *Calycopteris floribunda*. The antimicrobial activities of leaf extracts of *Calycopteris floribunda* Lam. in three different solvents such as diethyl ether-methanol, aqueous 90% methanol extract and petroleum ether-butanol extract were tested against *Bacillus cereus*, *Bacillus subtilis* and *Staphylococcus aureus*. The diethyl ether-methanol extract of the leaves and its petroleum ether-butanol fraction showed significant antibacterial activity. The antioxidant property was maximum in petroleum ether-butanol extract and was minimum in diethyl ether-methanol extract [31].

Sujit *et al.*; performed studies on dichloromethane-methanol extract of leaves of *Calycopteris floribunda* and its aqueous 90% methanol soluble fractions. These showed significant antibacterial activity against *Bacillus subtilis*, *Streptococcus pyogenes*, *Staphylococcus aureus* and *Salmonella typhi*. The aqueous 90% methanol and 1-butanol soluble fractions of the leaves showed significant β -glucuronidase inhibition and antioxidant activity. Two pure compounds, 3,8-di-*O*-methyl ellagic and 2,3,7-tri-*O*-methyl ellagic acids were isolated from the 1-butanol soluble fraction of the parent extract [32].

Satyanarayana and Chinna Eswaraiah; studied the *in vitro* antioxidant methods like superoxide radical, hydroxyl radical, lipid peroxidation and DPPH radical methods for chloroform and methanol extracts of *Calycopteris floribunda* stem. The results of antioxidant activity revealed that, the chloroform extract has lower IC50 values than the methanolic extract of *Calycopteris floribunda* Lam. The lower IC50 value indicates the higher free radical scavenging ability. So, the chloroform extract has better antioxidant activity than methanolic extract. The results were compared with the standard ascorbic acid [33].

Rajasekaran and Periasamy investigated ethanolic leaf extract of *Calycopteris floribunda* for hepatoprotective activity against cadmium induced liver damage. Various biochemical parameters, serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), serum alkaline phosphatase and total protein were determined to assess the effect of the leaf extract on the cadmium induced hepatic damage. The animals treated with cadmium recorded elevated concentration indicating severe hepatic damage by cadmium, whereas the blood samples from the animals treated with 200 mg/kg (b.w) and 400 mg/kg (b.w) of ethanolic leaf extract of *Calycopteris floribunda* showed significant reduction in the serum markers indicating the effect of the leaf extract in restoring the normal functional ability of the hepatocytes. Silymarin (100 mg/kg, p.o.) was given as reference drug. The present study concluded that the ethanolic leaf extract of *Calycopteris floribunda* showed significant hepatic protection against cadmium-induced hepatocellular injury [34].

Bhuvanewari Santharam *et al.*; reported an inhibitory concentration 50% (IC50) value was found ethyl acetate

extract of *Calycopteris floribunda* is more effective in hydroxyl radical scavenging activity than that of methanolic and petroleum ether extract. The IC50 values of ethyl acetate extract of *Calycopteris floribunda* and ascorbate were found to be 530 μ g/ml and 410 μ g/ml respectively. The ethyl acetate extract of *Calycopteris floribunda* was found more effective in the nitric oxide scavenging activity. The IC50 values of ethyl acetate extract of *Calycopteris floribunda* and ascorbate were found to be 570 μ g/ml and 410 μ g/ml respectively. But when compared to all the three extracts with ascorbate (standard), the ethyl acetate extract of *Calycopteris floribunda* showed the better result [35].

Bhuvanewari Santharam *et al.*; study showed significant ($P < 0.001$) elevation in plasma and LDL – cholesterol, triglycerides, phospholipids and atherogenic index when compared to that of normal rat. Administration of ethyl acetate extract of *Calycopteris floribunda* at the dose of 200 mg / kg b.wt / day p.o along with high fat diet significantly ($P < 0.001$) prevented the rise in the above mentioned biochemical parameters with significant rise in the level of HDL – cholesterol [36].

Conclusion

Based on numerous therapeutic properties in traditional medicinal system, it can be concluded that the plant *Calycopteris floribunda* is a valuable medicinal plant. The leaves of plant are most commonly used as ethno medicine. The pharmacological studies conducted on *Calycopteris floribunda* indicate the immense potential of this plant having many properties like antimicrobial, antibacterial, antiviral and Anti-inflammatory properties etc. On the basis of these results, it is very clear that *Calycopteris floribunda* is a plant with fabulous extensive use now and also with amazing potential for the future.

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