

A REVIEW OF LARGE LEAF BEAUTY BERRY (*CALLICARPA MACROPHYLLA VAHL.*): THERAPEUTIC INDICATIONS

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ABSTRACT

Callicarpa macrophylla Vahl. is commonly known as LARGE LEAF BEAUTY BERRY. It is widely used in traditional medicine ailments related to the circulatory, digestive, endocrine, respiratory and skeletal systems as well as to the infectious diseases. It is used as a source of medicine for years without any adverse effects. It is *Pittashamak* and effective in *Raktapradoshaja vikaras* as per Ayurveda. Crude extracts and isolated compounds from *Callicarpa macrophylla* show a wide spectrum of pharmacological activities, such as anti-diabetic, anti-inflammatory, antifungal, antibacterial, anti-pyretic & analgesic activities, as well as its usefulness help in alleviating pain in

rheumatism. Here we have carried out a systematic review of *Callicarpa macrophylla* documenting all its references in ancient texts and modern scientific studies.

KEYWORDS: *Priyangu*, *Callicarpa macrophylla*, *Pittashamak*, Pharmacological Action.

INTRODUCTION

Medicinal plants play a very important role in health sector. About 80% of the world population relies on the use of traditional medicine which is predominantly based on plant materials.^[1] About 7,500 plants are used in local health traditions, mostly in rural and tribal villages of India. Out of these, the real medicinal value of over 4,000 plants is either little known or unknown to the mainstream population. The classical systems of medicine such as Ayurveda, Siddha, Unani and Tibetan use about 1,200 plants.^[2]

Priyangu is a common herb in Ayurveda which is used as a medicine. By the name of *Priyangu*, at present three plants, *Callicarpa macrophylla Vahl*, *Prunus mahaleb linn.* & *Agalia roxburghia miq* are used in different part of India. Among all the plants, *Callicarpa macrophylla* is most commonly used plant. Detailed description of *gana* and *paryaya* in different *nighantus* is as follows-

NIGHANTU	GANNA	PARYAYA
<i>Dhanvantari Nighantu</i> ^[3]	<i>Chandanadi Varga</i>	<i>Falini, Priya, Gochandana, Priyavalli, Varnabhedini, Kanguni, Vrutta</i>
<i>Kaiyadev Nighantu</i> ^[4]	<i>Oushadhi varga</i>	<i>Falini, Kanta, Vanitalata, Godantini, Shyama, Kanguni, Vrutta</i>
<i>Raj Nighantu</i> ^[5]	<i>Aamradi varga</i>	<i>Falini, Falapriya Gauri, Vanitalata, Gochandani, Gauravalli, Parnabhedini, Kanguni, Vrutta</i>
<i>Bhavaprakash Nighantu</i> ^[6]	<i>Karpuradi varga</i>	<i>Falini, Kanta, lata, Godantini, mahilavya, Vishwaksenpriya, shyama, Gundra, Vrutta</i>

In *Charak Samhita*, *Priyangu* is included in *Shonitasthapana Mahakashaya*, *Sandhaniya Mahakashaya*, *Purishasangrahaniya Mahakashaya*, *Mutravirajaniya Mahakashaya* and *Prajasthpana Mahakashaya*.^[7] In *Sushrut Samhita*, *Priyangu* is kept in *Priyanguvadi gana* and *Anjanadi Gana*. *Acharya Vagbhatta* also included *Priyangu* in *Anjanadi Gana*. There are fifty eight references of *Priyangu* in *Charak Samhita* out of which thirty-one are under *Raktapradoshaja Vikara*.^[8]

Rasa-Panchak of *Priyangu* is as follows-

- *Guna - Guru, Ruksha*
- *Rasa - Kashaya, Tikta*
- *Virya – Sheeta*
- *Vipaka - Katu*
- *Doshaghanata – Vaatpittashamak*

Vernacular Names

Names in different languages

Hindi name: *Phalini, Daya*

English name: *Beutyberry*

Bengali name: Matara, Mathara

Gujarati name: *Priyangu*

Kannada name: *Priyangu*

Malayalam name: Gawhla, Nalal, Jativruksha

Marathi name: Garhala

Punjabi name: Priyang, Sumali

Tamil name: Ittauduga, Vettilai pattai, Seembakulthu

Telugu name: Kodauduga

Sanskrit Synonyms

Gandhaphali- The fruit has a strong odor.

Phalini- The plant bears many fruits.

Asthibandhan- Binds the bones together.

Gochandana, Shayama, Pitatandula, Karambha, Varnabhedini, Priya, Durjara, Kanta, Vanita, Lata, Shyama, Godantini, Kanguni, Kangu, Priyavalli, Shreyasi.

Taxonomy and Morphology

Scientific Classification of *Callicarpa macrophylla* is as follows-

Kingdom	Plantae
Division	Angiospermae
Order	Lamiales
Family	Verbanaceae
Class	Dicotyledons
Genus	Callicarpa
Species	Macrophylla



Priyangu is a stout shrub, about 1.2 to 1.8 m high, occurring in the sub-Himalayan tracts from Hazara eastwards to Assam up to 1800 m. and in Upper Gangetic and West Bengal plains.

Leaves are lanceolate to elliptic-oblong, 10-35 cm in length, 2-18 cm broad, mature glabrescent and rugose above or with numerous stubble-like small hairs, petiole 4-12 mm long, densely floccose-tomentose. Inflorescence axillary, solitary or often corymbose-cyme, densely stellate-hairy 1-2.5 cm long. Flowers are on short, slender pedicels; pedicel gland-dotted, tomentose. Fruit is globular, \pm 2 mm in diameter, glabrous, glandular, smooth and white. It flowers from May to August and fruits from September to February.^[9]

CHEMICAL COMPOSITION

Seeds & leaves contain Caliterpenone & its Monoacetate, Betasitosterol, in addition seed contains fatty acids.^[10] The bark contains betulinic acid. The roots and aerial part contain essential oil, (diterpene) calliterpenone, calliterpenone monoacetate. Seeds contains calliterpenone, calliterpenone-17-acetate, oleanolic acid.^[11]

Medicinal Properties of *Priyangu* according to Ayurveda-

Flowers and fruits are used part of *Priyangu*. Inflorescence is bitter and astringent in taste, which is pungent after digestion. It is cold in potency. Action of inflorescence is *Vaatpittashamak*, refrigerant, anti-diarrheal, diuretic, jointer, wound healer and as blood purifier. Fruit is sweet, bitter and astringent in taste. After digestion it is pungent in taste. It is cold, heavy and dry in physical properties, cold in potency. Fruit is used for *Vaatpittashaman* and *raktashodhan*.^[12] It is *Daahprashman*, *Vednasthapan*, *Durgandhnaashak* in properties. It has *twagdosshar*, *mutravirajniya*, *jwaraghna* and *Vishaghna* properties.^[13]

According to *Bhavprakash Nighantu*, its fruits and flowers are used in preparation of various Ayurvedic formulations. It can be used either as a decoction or as a powder. Oil prepared from it, called *Priyanguvadi Taila*, is recommended for local application on the wounds. *Priyangu* flowers are recommended to be used for syrup *Priyanguvasava* preparations according to *Charak Samhita*.

In *Charak Samhita*, it is recommended in bleeding disorders (*Raktapitta*), mainly in patients with *Pitta Prakriti*.^[14] In antenatal care, use of *Priyangu* is recommended mainly for its antiseptic activity.

In *Ashtanga Hrudaya*, *Priyangu* is recommended for stopping excessive bleeding. It can be used in chronic diarrhoea and *Pittaja* disorders, in healing fractures and wounds.^[15]

As per *Bhavprakash Nighantu*, it is suggested for treatment of dysentery (*Raktatisara*), fever (*Jwara*), excessive sweating, burning sensation of the body (*Daha*), body odour (*Durgandha*) and tumors.^[16]

In *Dhanvantari Nighantu*, it is advised to be used in delirium (*Moha*), burning sensation of the body (*Daha*), fever (*Jwara*), vomiting (*Chardi*) and bleeding disorders (*Raktapitta*).^[17]

Therapeutic Uses

- *Shitada*: *Priyangu*+*Musta*+*Triphala* are made into paste applied over gums. Ch. Chi-4/70
- *Parinama Shula* (Peptic ulcer): Vomiting is induced with leaf decoction of *Priyangu*. Ch Su-26
- *Jwara*: *Priyangu* is best for *Jwara* which contains *Madhura rasa*, *Shita virya* - Ch. Su. 26
- If bleeding does not stop, the powder of *Priyangu*, *Yasti*, *Masha* etc should be applied on wound.-A. H. Su. 27/48.
- Decrease Pitta: it comes under group which suppresses Pitta. A. H. Su. 27/48
- It cures chronic diarrhea, heal fracture, good for pitta and healing ulcers. A. H. Su. 15/37
- It helps in repairing the broken parts, fracture of bones. A.H. Su.6/12.
- *Priyangu* is mentioned in *Mratasanjivana Agada*. It is indicated to destroy all the poisons. Ch.Chi 23/54-60
- *Priyangu* is an ingredient of *Mahagandhastinamagada*. It is indicated for all types of poisons snake poison, rat poison, spider poison, root poison etc. Ch.Chi. 23/78-94
- It is included in *Amritghrat* to destroy all the poisons.Ch. Chi 242-249
- It is mentioned in *Ajeya Ghrta* as a main ingredient. It is indicated to destroy the effects of all kind of poisons. Su. K. 2/47-49, A.S.U.40/130-132
- *Priyangu* is included in *Tarkshya Agada* which is indicated to destroy poison even that of Takshak.Su. K.5/65-67, A.S.U.40/79-82
- *Priyangu* is an important ingredient of *Kalyanak Ghrta*. It cures possession by evil spirit, anaemia, epilepsy, homicidal poison, fever etc. Su. K. 6/8-11
- *Priyangu* is the main ingredient of *Padamak Agada* which is indicated to cure all insect poisons. A.H.U.37/70.

- *Priyangu* is included in *Rodhradi Agada*. *Rodhradi Agada* cures all the *Luta Visha*. A.H.U.37/86
- *Priyangu* is mentioned in *Sanjivana Agada*. This Agada restores the life of person who is unconscious by the effect of poison. A.S.U.40/59-67
- *Priyangu* is an ingredient of *Yapana Agada* which act like *Sanjivan Agada*. A.S.U. 40/68-72
- *Priyangu* is an important drug of *Kautilyodita Agada*. It is best for persons who have lost unconsciousness by powerful poisons, by several blows, by hanging or by drowning, to bring back unconsciousness. A.S.U.40/78-79
- *Priyangu* is indicated in the treatment of *Haritala Vish* for licking along with other medicines.A.S.U.40/141-143
- Mixture of *Priyangu* and other drugs is used in treatment of dyspnea seen as a complication of poison intake. A.S.U.47/15-16

Pharmacological Actions

Anti-bacterial Activity- Anti-bacterial activity of *Callicarpa macrophylla Vahl* is studied in many articles. Cytotoxic and antibacterial activity of methanol extract of *Callicarpa macrophylla* leaves is studied. The highest (92%) cells growth inhibition occurred at the 2.5 mg/mL concentration and maximum zone of inhibition (22 mm) was found against *Bacillus cereus* bacterial strain at the highest concentration of 350 µg/disc.^[18]

Analgesic Activity- The effects and actions of *Callicarpa macrophylla Vahl* have shown remarkable results in animal studies. Aqueous as well as ethanolic extracts of its roots (at two concentrations 200 & 400 mg/kg) were evaluated for its analgesic and anti-inflammatory potentials using tail immersion test and carrageenan paw edema method in albino rats respectively by Yadav et al, 2012. A significant reduction of the painful sensation due to tail immersion in warm water was observed followed oral administration of the ethanolic and aqueous extract at dose of 200, 400mg/kg of leaves and roots of *Callicarpa macrophylla Vahl*.^[19]

Anti-Inflammatory Activity- In comparison with standard drug, Diclofenac sodium (20 mg/kg body wt), the ethanolic and aqueous extracts (200 mg/kg, 400 mg /kg) of leaves of *Callicarpa macrophylla Vahl* showed significant ($p < 0.05$) anti- inflammatory effect in the

acute phase of the inflammation. The anti-inflammatory activity may cause inhibition of histamine, serotonin or prostaglandin synthesis.^[20]

Anti-fungal Activity- antifungal efficacy of aqueous extract of *Callicarpa macrophylla Vahl* against six pathogenic fungi namely viz, *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus niger*, *Cladosporium cladosporidies*, *Drechslera halodes* and *Fusarium moniliforme* was studied by agar wall diffusion method. Study shows remarkable inhibition in fungal growth on different concentration of aqueous extract.^[21]

In another study, aqueous and ethanolic extract of stem of *Callicarpa macrophylla Vahl* was taken for anti- fungal study against seven fungal strains. Study was done by Agar disc diffusion method. Study shows that ethanolic extract of stem exhibit anti- fungal activity while aqueous extract do not exhibit any such type of activity.^[22]

Antidiabetic Activity- The study of the antidiabetic activity of the flower extract of *Callicarpa macrophylla Vahl* was investigated in dexamethasone-induced diabetic rats. The study shows that animal treating with flower extract of *Callicarpa macrophylla*, have gradually decrease in blood glucose level. Antidiabetic effect was compared with Glibenclamide 1 mg/kg.^[23]

Hepatoprotective Activity- Hepatoprotective activity of extract was studied in Albino rats against Paracetamol (3 g/kg b.w./p.o. 3 days) and carbon tetrachloride (2 ml/kg, b.w. /s.c. 4 days) induced hepatotoxicity. Standard drug was used for hepatoprotection (Silymarin 25 mg/kg, b.w./p.o.). It is observed that hydroalcoholic extract of aerial parts of *Callicarpa macrophylla* possess hepatoprotective property which was evident by biochemical parameters and histopathological reports.^[24]

Anti-Arthritic Activity- Anti-arthritic effect of *Callicarpa macrophylla Vahl* was studied by testing various in-vitro parameters like protein denaturation and membrane stabilization. Denaturation of tissue proteins is one of the well documented causes of inflammatory and arthritic diseases. Production of auto-antigens in certain arthritic diseases may be due to denaturation of proteins in vivo.^[25, 26]

Toxicity- There is no significant information regarding toxic effect of *Callicarpa macrophylla Vahl*. The crude methanolic extract of both leaves and bark of *Callicarpa macrophylla Vahl* exhibited absolute safety in both in-vitro and in-vivo models.^[27]

Important Ayurvedic formulations

Fruit of *Callicarpa macrophylla Vahl* is used in different Ayurvedic preparations like *Jirakadi Modaka*, *Brhatphala Ghrta*, *Brhatcchagaladya Ghrta*, *Vyaghri Taila*^[28], while Ayurvedic preparations having *Callicarpa macrophylla* are *Khadiradi Gutika*, *Eladi curna*, *Kanaka Taila*, *Kunkumadi Taila* and *Nilikadya Taila*.^[29]

CONCLUSIONS

Priyangu is widely available in India and it is freely used. *Callicarpa macrophylla Vahl* has so many references in *Charak Samhita* and different *Nighantus*. It is randomly described in all the important *Agada* of *Sushrut Samhita Kalpa Sthana*, *Ashtang Samgraha* and *Ashtang Hridaya*. Due to its pharmacological properties it is widely used in *Raktaja* and *Pittaja vikara*. It can be used both internally and externally. It is documented to have anti-inflammatory, analgesic, antibacterial, antifungal, anti-arthritic as well as antidiabetic properties. Most of the studies that have been done are on animal subjects. Human trials need to be conducted for validating its use in modern medicine and the studies are influencing. In Ayurveda, flower and fruits are to be use part of *Priyangu*. Number of studies have performed on the action of extracts of its flowers, stem, leaves and other aerial parts. *Callicarpa macrophylla Vahl* have a lot of potential for research on flowers, fruits and clinical use.

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