

# A REVIEW ON BAUHINIA RACEMOSA

Prajakta S. Bhosale<sup>\*1</sup>, Rajkumar V. Shete<sup>2</sup>

<sup>1</sup> M. Pharm. Student, Department of Pharmacology, Rajgad Dnyanpeeth's College of Pharmacy, Bor- 412206 Pune, Maharashtra, India

E mail address: itsbhosaleprajakta77@gmail.com

<sup>2</sup> Principal, Department of Pharmacology, Rajgad Dnyanpeeth's College of Pharmacy, Bor- 412206 Pune, Maharashtra, India

## ABSTRACT

Medicinal plants were used from vedic times. Since many years they have been used to treat and prevent many types of disease. The *Bauhinia racemosa*, Lam belonging to the *caesalpiniaceae* family. It is tiny, anfractuous, brist tree with dangled branches; this tree is established all over India, ascending to an altitude of 1,650m in the western Himalayas. This review aims to integrate traditional ethnomedicinal knowledge and modern scientific findings of *Bauhinia racemosa* to understand their therapeutic potential. Under the genus of bauhinia More than 200 species of flowering plants are available, in that racemosa is one. Which is called as "sonpatta Tree" as it is considered as gold for its medicinal values. Almost each and every part of the plant has medicinal value. The bark and leaves of B. racemosa are sweet and pungent, cooling, astringent and used in the treatment of headache, fever, skin diseases, blood diseases, dysentery and diarrhea. An extract of the leaves has been shown analgesic, antipyretic, anti-inflammatory, antispasmodic, anthelmintic and antimicrobial activity. The tree has anti-tumor qualities and is widely used in Ayurveda to treat early stage cancer. Chemical compounds such as  $\beta$ -sitosterol and  $\beta$ -amyrin were isolated from the bark of stem of this plant. Five flavonols (kaempferol and quercetin) and two coumarins were isolated from the leaves of this plant. Stilbene (resveratrol) was isolated from heartwood of B. racemosa.

**Keywords:** *Bauhinia racemosa*, *caesalpiniaceae*, anti-inflammatory, antipyretic

## INTRODUCTION

One of the criticisms of herbal medicine is the lack of standardization and quality control profiles. In addition, there is evidence that herbs have been used in the treatment of diseases and to revitalize the body system in almost all ancient civilizations. For a long period of time, plants have been a valuable source of natural products for maintaining human health especially in the last decade, with more intensive studies of natural therapies. In developing countries, most people living in rural areas use traditional medicine almost exclusively to treat all kind of diseases. In the medicinal properties of plants could be based on the antioxidant, antimicrobial and antipyretic effects of the phytochemicals in them. Likewise, because information on the use of plant species for therapeutic purposes has been transmitted from one generation to the next through oral tradition, this knowledge of therapeutic plants has begun to decline and become obsolete due to lack of recognition. Of the younger generations as a result of a change in attitude and permanent social vision of what is valuable. The *Bauhinia racemosa* plant is used in traditional medicine to treat various ailments<sup>1</sup>.

The *Bauhinia racemosa*, Lam belonging to the *caesalpiniaceae* family. It is small, crooked, bushy tree with drooping branches, found throughout India, ascending to an altitude of 1,650m in the western Himalayas.

The plant *bauhinia racemosa* is known as **Banraj**(Bengali), **Asundro**(Gujrati),**Jhinjeri**, **kachnal,ashta**(Hindi),**Banne**(Kannada),**Katapuli**(Malaylam),**Apta**(Marathi),**Ombaroda**(Oria), **Svetakanchana**(Sanskrit), **Araivatta-atthi**(Tamil), **Ari**(Telugu), **Kosundra**(Punjabi).

Bark bluish black, rough, pinkish red inside, turning brown on exposure; Leaves broader than long , rigidly coriaceous , slightly cordate , clothed more or less densely beneath with grey pubescence; flowers yellow, in short-peduncled , lax, terminal and leaf-opposed racemes; pods falcate, glabrous ,turgid; seeds dark reddish brown. The bark yield a strong cordage fibre, also used for torches and slow matches. It is highly astringent and is used for dysentery. It showed significant anti-inflammatory and cholagogue activities. Octacosane,  $\beta$ -amylin, and  $\beta$ -sitosterole have been isolated from the bark. The leaves are given with onion for diaecheoa;they are also reported to be anthelmintic. The leaves are used in manufacturing of bidis.

The seeds contain:

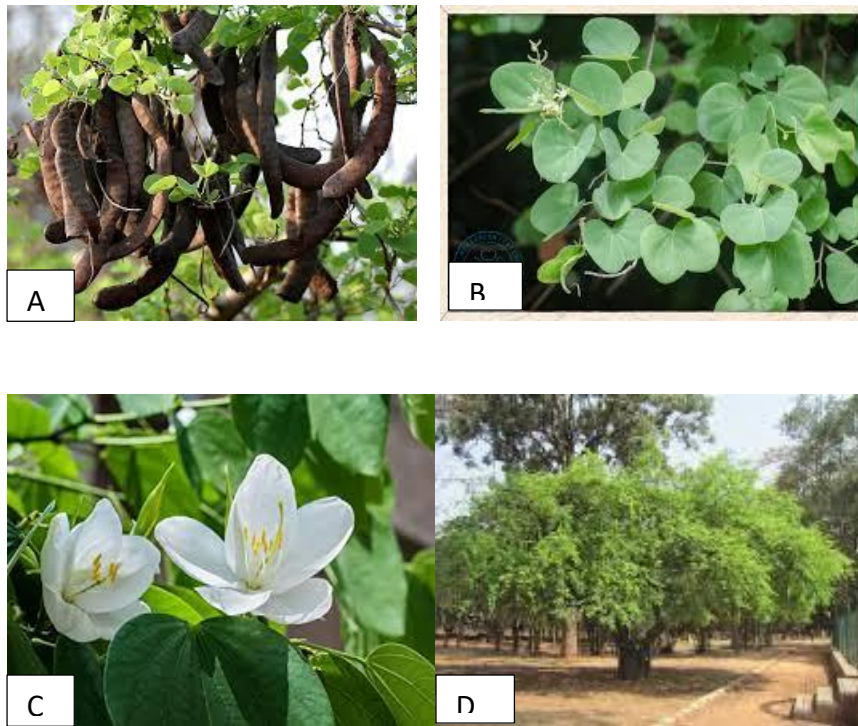
Protein	10.0
Moisture	12.5
Water soluble musilage	4.0%
Pentosan	7.2

The wood is brown with darker patches, haed and heavy 9wt, 736 kg/m. It is used for plough and yokes and also as fuel<sup>2</sup>.

➤ **CHEMICAL CONSTITUENTS<sup>3,4,11</sup> :**

Plant part	Chemical constituents
<b>Leaf</b>	Flavonols(kaemferole, Quercetin) and coumarine (Scopoletin and scopolin)
<b>Bark</b>	Octacosane, B-amyrin,B-sitosterol
<b>Seed/fruit</b>	Flavonoids, Crude protein, and lipid
<b>Root</b>	Tetracyclic lupeol, Betulin, B-sitosterol, and tetracyclic 2, 2-Dimethyl chroman.
<b>Heart Wood</b>	stilbene (resveratrol)

## ➤ PLANT PROFILE



**Fig. (A) Pods of *B. racemosa*. (B) Leaves of *B. racemosa*. (C) Flower of *B. racemosa*. (D) Whole tree of *B. racemosa*.**

➤ DRUG REVIEW<sup>5</sup>:

- Sankrit Name - Asman Taka
- Botanical Name - Bauhinia racemosa
- Genus – Bauhinia

## ➤ MORPHOLOGY:

- It is a small, broad leafed tree, up to 12 meter
- **Bark** grey to black, rough, thinly scaly, with number of vertical cracks.
- **Leaves** simple, bilobed, alternate, stipules small caduceus.
- **Flowers** bisexual, 10-12 mm across, yellowish white, in terminal & leaf opposed few flowered racemose.
- **Fruit pods** 15-22\*1.5-2 cm, oblong, blackish brown, turgid, apex horned indehiscent.
- **Seeds** 10-20 ovoid.

## ➤ COLLECTION PERIOD :

**Flowering season:** March to June.

**Fruiting season:** November & December.

## ➤ Dravya Gunkarma :

**Rasa** –Kashaya

**Guna** – Laghu

**Veerya** – Sheeta

**Vipaka** – Katu, Doshakarma- Kaphapittahara

➤ **ECONOMICAL IMPOTANCE :**

*Bauhinia racemosa* leaves are used for making bidies, thus the *bauhinia racemosa* plant is known as beedi leaf tree.

It is good feed for sheep, goats & cattle.

Flowers of *bauhinia racemosa* have more importance in apiculture and also a pot herb in curries & made into pickle (chutney).<sup>6</sup>

The bark of plant is used for tanning and dyeing. The tree yields a useful gum and fibers<sup>3</sup>.

➤ **TRADITIONAL USES :**

The *Bauhinia racemosa* plant is a traditional medicine used in the treatment of various disorders.

The stem bark is an astringent and it is used to treat headache, fever, skin diseases and tumours. In Ayurveda the bark is useful for the treatment of malaria, dysentery and diarrhoea.

Leaves are sweetish and pungent, refrigerant, antipyretic, astringent, vermifugal, cure biliousness, urinary discharge, thirst headache, quartan fever, vatta, anal fistula, tuberculous glands, skin disease, throat trouble, diseases of the blood, good in chronic dysentery and diarrhoea<sup>1</sup>. Stem bark of *bauhinia racemosa* is kept in house as snake repellent. Leaves of this plant chewed by two people and air is blown in patient's ear, after a glass of water is given to the patient to cure scorpion bite. For the treatment of jaundice, water extract of its bark, leaves and roots are taken two times daily after meal for 2-4 week in the region of Jalgaon, Dhule and Nandurbar district of Maharashtra. Leaves of this plant *B racemosa*, *Aloe vera* and *p.murex* crushed together and mixed water given to animals 3 times a day can relief food poisoning in cattle<sup>7</sup>.

➤ **NUTRITIONAL IMPORTANCE :**

*Bauhinia racemosa* was analysed for pod morphology, proximate composition, seed protein fractions, amino acid composition, minerals and antinutritional factors. Seeds of *Bauhinia racemosa* were enriched in Ca and Fe. The contents of the essential amino acids lysine, tyrosine and phenylalanine were fairly high as the contents of sulphur amino acids were limiting. Antinutritional substances like total free phenols, tannins, L-DOPA and phyto-haemagglutinating activity also were investigated<sup>3</sup>.

➤ **MARKEDTED FORMULATION :**

Masanumas2 is a formulation for the second month of pregnancy. Each coated tablet contains- Ashmantak (*Bauhinia racemosa*) bark extract, Black Sesame (*Sesum indicum*) seed extract, Manjishtha (*Rubia cordifolia*) stem extract and Shatavari (*Asparagus recemosus*) root extract 60mg each. Each pack contains 120 tabs. Dose: 2 tablets with lunch and 2 tablets with dinner. Indications: Habitual abortions, repeated abortions, high value pregnancies, high risk pregnancies<sup>7</sup>.

➤ Botanical Discription<sup>2,7</sup> :

Sr No.	Name of species	Common Names	Discription
1.	<i>Bauhinia variegata</i> Linn.	<b>Hindi</b> : Kachnar <b>Bengali</b> :Raktakanchan	<i>Bauhinia variegata</i> ( <i>fabaceae</i> ) is a valuable medicinal plant. Kachnar is a medium sized deciduous tree, bark dark brown, nearly smooth, young shoots brown-pubescent. Flowers large,fragrant, white or purplish, appearing when the tree is leafless. It is distributed in sub-Himalayan tract and outer Himalayas of Punjab.
2.	<i>Bauhinia purpurea</i> Linn.	<b>Hindi</b> : Gairal, Kakiar, Katniar, Khairwal, Koilari, Koinar, Sona <b>Sanskrit</b> : Raktapushpakovidara <b>Marathi</b> : Atmatti, Deva Kanchana <b>Tamil</b> : Kalavilaichi, Mandarai <b>Telugu</b> : Boroda, Debokanjoro <b>Burma</b> : Mahahlegani	A medium sized, evergreen ornamental tree, found throughout India, ascending to an altitude of 1,300 m in the sub-Himalayan tract. Bark dark grey or brown, pink to pale yellow inside; leaves rigidly sub-coriaceous, glabrous, shallowly cordate; flowers varying in colour from white to purple, in terminal and axillary short-peduncled, few-flowered corymbs; pods firm, flat, glabrous, 12-15 seeded.
3.	<i>Bauhinia semla</i>	<b>Hindi</b> :Semla <b>Marathi</b> : Koilar <b>Telugu</b> : Nirpa <b>Punjab</b> : Kural.	A medium-sized deciduous tree, found throughout the greater part of India, ascends to an altitude of 1.500 m in the western Himalayas. Leaves rigidly coriaceous, broader than long, glabrous below, usually deeply cordate; flowers yellow, in ample terminal panicles; pods hard flat, glabrous, 6-8 seeded.

4.	<b><i>Bauhinia tomentosa</i> Linn.</b>	<b>Gujrati :</b> Chanpo <b>Hindi :</b> Kachnar <b>Marathi :</b> Aptu <b>Tamil :</b> Iruvaji <b>Telugu:</b> Adavimandaramu	An erect shrub, found in the plains southward of Delhi, in the peninsular region and in West Bengal. Leaves broader than long , coriaceous, pubescent below; flowers with a distinct odour , usually axillary, pendent and half open, yellow with a maroon dot at the base of the central petal; pods distinctly stalked, glabrous, 6-10 seeded.
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➤ **PHARMACOLOGICAL INVESTIGATION :**

*Bauhinia racemosa* is having, abortifacient, anti-anxiety, anthelmintic, antimicrobial, antihistaminic, anti-inflammatory, analgesic and antipuretic effects<sup>7</sup>.

**ANTI-HISTAMINIC ACTIVITY<sup>3</sup>**

EEBR leaves inhibited clonidine- induced catalepsy in swiss albino mice ( male)at the dose 50mg/kg(ip). But there was no effect on haloperidol-induced catalepsy suggesting that the inhibition is through an antihistaminic action and that there is no role of dopamine. It has role in the treatment of asthma.

**ANTI-ANXIETY ACTIVITY<sup>8</sup>**

The MEBR, extract administered orally to swiss albino mice at the dose 150mg/kg and 300mg/kg. Increase in the time spent and the elevated plus-maze. It also increased the time spent by mice in the illuminated side of the light-dark test, showed significant increase in nose poking and decrease locomotion in holr board test also caused significant reduction in freezing time in comparison with control group. That indicate MEBR is an effective anxiolytic agent.

**ANTIMALERIAL ACTIVITY<sup>7</sup>**

Racemosal and de-0-methylracemosol exhibited cytotoxicity against KB cell line (EC<sub>90</sub> at 15.0 µg/ml and 5.6 µg/ml, respectively) and BC cell line (EC<sub>90</sub> at 6.1 µg/ml and 3.6 µg/ml respectively) exhibiting moderate antimalarial activity against parasite *plasmodium falcipararum* (EC<sub>50</sub> at 0.9 µg/ml and 2µg/ml, respectively).

**ANTI-OXIDANT ACTIVITY<sup>9</sup>**

The leaves of AEER showed good anti- oxidant activity in different system of assay. IC<sub>90</sub> value found were 1739, 536,216 and 797 µg/ml for hydroxyl radial-scavenging, superoxide radial- scavenging, DPPH radial-

scavenging and lipid peroxidation preventive activities, respectively. Total antioxidant capacity was found to be 16.5 and 58.1 Gallic acid equivalent, AAE ( $\mu\text{g}/\text{mg}$  plant material) respectively. Phenol and flavonoid content was found to be 150 GAE and 13 Catechin Equivalent ( $\mu\text{g}/\text{mg}$  plant material) respectively.

### ANTI-HIV ACTIVITY<sup>10</sup>

The effect of *bauhinia racemosa* extract on acute HIV-1 infectivity was measured by the syncytia formation assay. In the presence or absence of various concentrations of samples,  $4 \times 10^4$  C8166 cells were infected with HIV-1 at a multiplicity of infection (MOI) of 0.0015 and cultured in 96-well plates at  $37^\circ\text{C}$  in 5%  $\text{CO}_2$  for 3 days. Post-infection, the cytopathic effect (CPE) was measured by counting the number of syncytia (multinucleated giant cell) in each well of 96-well plates under an inverted microscope ( $100\times$ ). The inhibitory percentage of syncytia formation was calculated by the percentage of syncytia number in sample-treated culture compared to that in infected control culture. 50% effective concentration (EC<sub>50</sub>) was calculated, 50% cytotoxic concentration (CC<sub>50</sub>) and 50% effective concentration (EC<sub>50</sub>) was also determined.

### ANTHELMINTIC ACTIVITY<sup>3</sup>

Anthelmintic activity of stem bark, leaves, seeds and root of *B. Racemosa* were separately studied using Indian adult earthworms, *Pherentima posthuma*. Results showed that the leaves of *B. Racemosa* took less time to cause paralysis and death of the earthworms. The petroleum ether, chloroform, ethyl acetate and methanol extracts of leaves were also studied for their anthelmintic activity, which involved determination of the time of paralysis and time of death of the worms. Results showed that the petroleum ether extract of leaves of *B. Racemosa* at 60 mg/ml was most potent as compared to other extracts and standard drug Albendazole. The order of potency was observed as petroleum ether > ethyl acetate > methanol > chloroform extract. It can be concluded that anthelmintic activity of the leaves of *B. Racemosa* is due to the active principles present in the petroleum ether and ethyl acetate extracts.<sup>37</sup> order of potency was observed as petroleum ether > ethyl acetate > methanol > chloroform extract. It can be concluded that anthelmintic activity of the leaves of *B. Racemosa* is due to the active principles present in the petroleum ether and ethyl acetate extracts.

### CONCLUSION:

The plant of *B. racemosa* Lam. could be a source of natural medicinal agent, which has contribution of most significant therapeutic chemical constituents responsible for prevent and management of various types of disease. *B. racemosa*, is the versatile medicinal plant. It is the source of various types of compounds having different chemical structure. Some studies have been done on the biological activity and plausible medicinal applications of these compounds and hence a thorough investigation is needed to exploit their therapeutic utilities for combating diseases. Although crude extracts from numerous parts of this plant have medicinal applications like Antioxidant activity, Anti- HIV activity, and Antimalarial activity. The plant also has nutritional importance. The global scene is now pointing the use of non-toxic plant products with traditional

medicinal uses. Therefore, development of new drugs should be undertaken from centuries for the control of various diseases. In research more information about this medicinal plant *B. racemosa* and its products are important for their economic and therapeutic use. Therefore, this review article could be useful for researchers to find more new chemical substances responsible for their supposed traditional activities.

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