



## A REVIEW ON BOMBAX CEIBA

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### ABSTRACT :

From the beginning of agriculture, medicinal plants have been a significant source. The Bombax

ceiba, which belongs to the Bombacaceae family, is occasionally called the silk cotton tree and semal. The tall, deciduous Semal tree can reach a height of 40 meters and a girth of at least 6 meters.

Traditional medical systems including Ayurveda, Siddha, and Unani have documented using it

medicinally. utilized in pharmaceutical activities such as aphrodisiac, cytotoxicity, anti-inflammatory, anti-diabetic, hypotensive, anti-obesity, antioxidant, antiangiogenic, and antimicrobial Details on the Bombax Ceiba (semal) tree, including its medicinal qualities, health advantages, and natural

treatments for seminal issues purifying blood, Leadsure Bombax Ceiba, often known as the red silk cotton tree, is one of the important medicinal trees of tropical and subtropical India.

**Key points** Bombax ceiba, Antipyretic effects, Anti-inflammatory, Adaptive action, Wound healing, Pharmacological action, Ayurveda.

### INTRODUCTION :

Bombax ceiba, a member of the Bombacaceae family, is sometimes referred to as the silk cotton tree and semal [1]. It is a significant medicinal plant found in tropical and subtropical India, as well as in Pakistan, Sri Lanka, and Java, Sumatra, Bangladesh, Myanmar, Malaysia, and south eastern Australia [3]. It has several conventional applications. additionally, reports of its medical use in India

conventional medical systems like Ayurveda, Unani and Siddha. It goes by several names, including red cotton tree, Indian kapok tree (English), semal (Hindi), shalmali (Sanskrit), and shimul (Bengali). kondabruka (Telugu), mullilavu (Malyalam), in several languages [14]. Some of the key life-saving medications in the arsenal of contemporary medicine have been derived from natural materials. Nevertheless, only 6% of the projected 250,000–400,000 plant species have been researched for 15% and biological activity have both been studied phytochemically. This highlights the necessity of carefully thought-out, activity-guided phytopharmacological assessment of herbal medications. The Malvaceae family includes the bombax ceiba tree, which is found in China, Taiwan, Malaysia,

Indonesia, and Hong Kong. The tree bears crimson flowers that five petals. The Tibetans call it "salmari," and in Usually referred to as the Europe and America cotton tree. In some places of China, it is used as tea. This tree has a lot of different phytochemicals. Alkaloids, flavonoids, glycosides, coumarins, proteins, and amino acids have all been identified via extracts. There are multiple known effects of Bombax ceiba among them are aphrodisiacs, anti-inflammatory, anti-diabetic, antibacterial, hepatoprotective, and antielderly and hypotensive [1].

### HISTORY :

In the "Mahabharata," it is said that "Pitamaha," after creating the world, rested beneath the "Salmali" tree. The 'Yajnavalkya' lists it as one of the trees of the underworld. origins of very young trees are aphrodisiac, alterative, and astringent characteristics. Gum is used as an astringent in the Netherlands. The young fruits are preserved and utilized as a both soothing and sharp. The gum is also utilized in vomiting and diarrhea [13]. Cultural significance is the foundation of the rich history of the Bombax ceiba tree, popularly called the red silk-cotton tree. It is a native of South and Southeast Asia, frequently planted next to temples, and held in high regard in Buddhist and Hindu traditions. In the past, life jackets and pillows were made from its cotton-like fibers. Traditional medicine also makes use of several sections of the tree. The tree's long existence in the area is a result of both its majestic look and cultural significance [10].

## MORPHOLOGY

Semal is a tall, deciduous tree that can grow to a height of 40 meters with a circumference of 6 meters or more [11]. Its branches extend horizontally, and its young stems are covered in hard, prickly spines. The bark is colored from silver grey to pale ash. Large flowers can be found in diameter, crimson in hue, and teeming with much nectar. The fruits are up to 15 mm long, brown capsule-shaped, and contain tons of black seeds that are smooth, oily, and have dense, silky hair. These seeds are irregularly shaped and ovoid in shape. Fruit pulp tastes well and is edible [1]. Complex leaves are found on Semal trees. Whom the appearance is palmate. Large and digitate, with a common petiole and a spreading, glabrous appearance. Leaf length ranges from 15 to 30 cm. Every leaflet is not the same size 10 to 20 cm is the range. In most cases, no new leaves appear to the end of the flowering season [22,23].

### 1.1 Bark

The 1.8–2.5 centimeter thick, smooth bark of Semal is light, ashy to silver gray. Middle aged, turning harsh about vertical fissures that are not uniform on elder trees. In contrast, microscopic stem bark reveals a layered structure of 10–15 layers that contains irregular stone cells that are transversely extended and radially structured into thin-walled cork cells that are covered in outer layers (Springer Briefs in Pharmacology and Toxicology, n.d.) [6]

Study of bark of *Bombax ceiba* Linn is given below:

**Table 1: Study of stem bark of *B. ceiba* (Springer Briefs in Pharmacology and Toxicology, n.d.) [5]**

Analysis	Value
Foreign matter	1% or less
Constituents	Tannins, gums and saponins
Alcohol-soluble extractive	2% or less
Water-soluble extractive	7% or less
Total ash	13% or less
Acid-insoluble ash 2%	2% or less



**FIG 1: BARK OF BOMBEX CEIBA [42]**

### Leave

The leaves of the semal tree are complex and have a palmate shape. That's precisely emerges where the palms do in Man. It is large, spreading, and digitate. Glabrous with a typical petiole, and the leafsize is between 15 and 30cm in length. A leaf is made up of several leaflets. Number Five Though they can occasionally be found in seven, leaflets are mostly found in a single leaf. The dimensions leaflets ranges in size from 10 to20cm. Generally speaking, the center's leaflets are longer than those found in the digits in the palm [7]. The entire leaflet is lanceolate, acuminate, somewhat coriaceous. However, research on the phytoconstituents of leaves revealed that mangiferin, a flavonoid extracted from plants, was once mistakenly identified as a novel chemical called Shamimina and was, in fact, explained as mangiferin (Springer Briefs in Pharmacology and Toxicology, n.d.)

**Nutritional composition of leaves of Bombax ceiba L is given below.**

**Table 2: Nutritional composition of Bombax ceiba L leaves dry basis (Preparation of Value added Products from Flower and Fruits of Bombax Ceiba (Simbal Tree), 2018) [5]**

Nutrients	Values (%)
Carbohydrate	1.48
Protein	0.7
Fats	0.75
Fibre	2.85
Mineral	13.23
Sodium	19.07(mg/100g)
K	153.66(mg/100g)
Ca	177(mg/100g)



**FIG 2: LEAVE OF BOMBAX CEIBA [46]**

### 1.2 Flowers

The vivid red blossoms, which adorn the leafless trees from January to March, are huge and striking. It displays an incredibly powerful amazing sight in the winter and spring when the typically bare Huge juicy crimson blossoms adorn the branches. As birds are drawn to them, and are most likely the cause of their pollination. Such Blooms create a Red carpet in the ground for a small number of weeks—two to three weeks—subsequent to dropping Semal flowers are incredibly colorful, eye-catching, and notice able from a distance. People like to plant it because of its lovely and eye- catching blossoms.as the decorative plant in the garden or botanical garden, or as the species avenue. There are plenty of big, 10–12.5 cm-wide flowers [4]. It When flowers are in full bloom, they are grouped around the tips of the branches. It possesses the cup-shaped, thick, meaty Sepals.

Typically, it produces five petals that are 7.5–15 cm long, oblong, and recurved in a single flower above, juicy, and vivid crimson in color (occasionally yellow or orange). The young, dried fruit of B. Ceiba is used to assess kidney and bladder ulcers, chronic inflammation, and certain types of dysuria and stranguria; however, the scientific basis for this application is unknown (Gadge & Jalalpure, 2012).

The physicochemical composition is given in the table below:

Table 3: Chemical composition of flower buds (Springer Briefs in Pharmacology and Toxicology, n.d.) [5]

composition	value
Moisture %	85.66
Protein%	1.38
Carbohydrates%	11.95
Ash%	1.09
Calcium (mg/100g)	92.25
Magnesium (mg/100g)	54.24
Phosphorous(mg/100g)	49.00

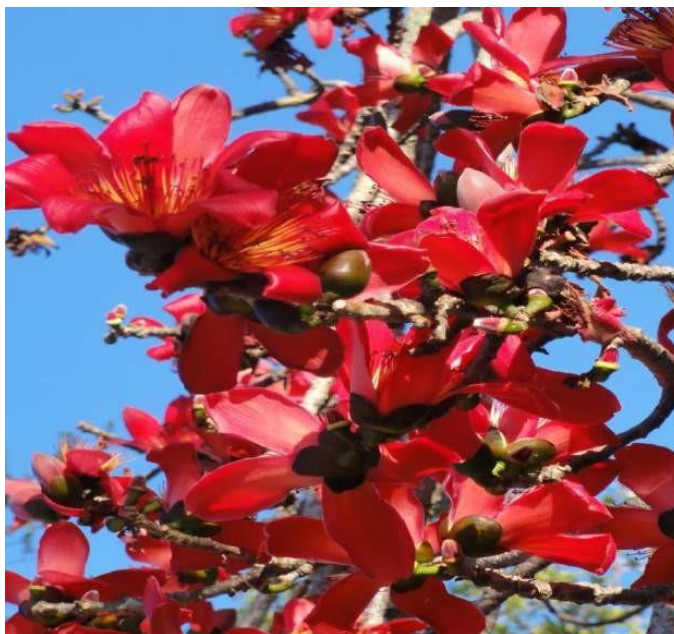


FIG 3: FLOWERS OF BOMBAX CEIBA [43]

### *Capsule*

The pods have five locudally located valves that are woody or downy, and they are roughly 10–18 cm long and oblong-oval in form inside, covered in silky hairs on the exterior.



FIG 4: CAPSULE OF BOMBAX CEIBA [45]

**Seed**

There are numerous smooth, ovoid, 6–9 mm long seeds inside the capsule. These germplasm are greasy and encircled by a dense clump of long smooth hair or floss, which is why it's readily blown away by wind [5].

Study of seed of *Bombax ceiba* Linn is given below:

**Table 4: Chemical composition of seed (Springer Briefs in Pharmacology and Toxicology, n.d.) [8]**

composition	Value (%)
Moisture	11.40
Protein	36.50
Fat	0.80
Carbohydrate	24.70
Crude fibre	19.90
Mineral	24.72



**FIG 5: SEED OF BOMBAX CEIBA [44]**

## TAXONOMICAL CLASSIFICATION

The Taxonomical classification of *Bombax ceiba* is the following [2,14]

**Table 5: Taxonomical classification**

RANK	SCIENTIFIC NAME & COMMON NAME
KINGDOM	Plantae – Plants
SUBKINGDOM	Tracheobionta – Vascular Plants

SUPER DIVISION	Spermatophyta – Seed Plants
DIVISION	Magnoliophyta – Flowering Plants
CLASS	Magnoliopsida – Dicotyledons
SUBCLASS	Dilleniidae
ORDER	Malvales
FAMILY	Bombacaceae
GENUS	Bombax L. – Cotton Tree
SPECIES	Bombax ceiba L. – Red silk cotton tree

## USES OF VARIOUS PARTS

**Table 6: Use of various parts of Bombax ceiba is the following [41]**

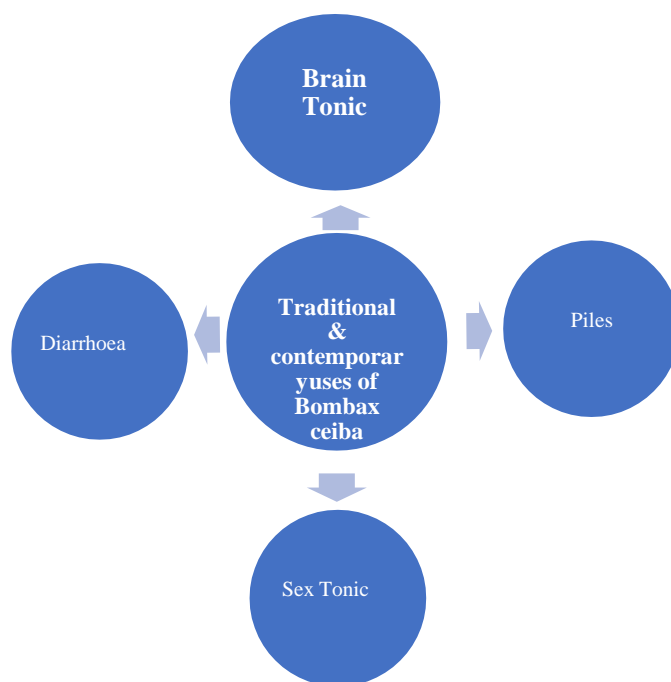
Various parts of Bombax ceiba	Uses of parts
Bark	Emetic; used as a styptic in metrorrhagia
Gum	Used as acrid, astringent, demulcent, tonic, alterative, haemostatic and aphrodisiac; usefull in diarrhea, dysentery, menorrhagia, cough, leucorrhoea, stomatitis and burning of the body.
Root	Has stimulant, demulcent, tonic, diuretic, emetic and aphrodisiac properties; given in impotence, leucorrhoea, over bleeding in menstruation, improve breast milk, cure cold & cough when used with black pepper and dry ginger powder
Young tap root	Astringent, and is used in dysentery.

## MEDICINAL USE OF BOMBAX CEIBA

Bombax Ceiba (semal) tree details and its health benefits, medicinal properties and natural remedies to treat Seminal disorders, Blood purification, Leucorrhoea etc [9].

### ❖ *Uses from NIF Database..*

- i. **Pimples:-** Make a paste of thorn with milk. Apply on the pimples for seven days.
- ii. **Wound:-** Apply the fresh bark paste topically.
- iii. **Diarrhoea:-** Take a spoonful of leaf juice along with some sugar candy for four days.
- iv. **Weakness:-** From the semal flower take green base part, clean and drying shade. Grind to make powder. Mix one spoon powder, honey (2tbsp) desi ghee (1tbsp) in milk and drink.
- v. **Cold and cough:-** Mix semal root powder with black pepper and dry ginger powder. Take in small amount to cure cold and cough.
- vi. **Gynaecological disorder:-** Take the root juice orally. Take the gum powder (5g) with water for five days.
- vii. **Urinary disorder:-** Take orally the decoction (10ml) of the bark of semal and flowers of palash (*Butea monosperma* (Lamk.) Taub.) mixed in 2:1 ratio [10].



**FIG 6: various Traditional & contemporary uses of Bombax ceiba [12,15]**

## PHARMACOLOGICAL ACTIVITY

Bombax ceiba, commonly known as the red silk-cotton tree, has various pharmacological activities attributed to it, primarily due to its diverse chemical composition. Some of its pharmacological activities include [30].

### 1.3 Anti-inflammatory properties

The bark is used to treat rheumatism and other elements in traditional medicine since it is said to have anti-inflammatory qualities. Bombax ceiba have shown anti-inflammatory properties in preclinical studies. Based on certain research it appears that bombax ceiba extract have anti-inflammatory qualities that may be help treat inflammatory disease like arthritis [20].

### 1.4 Respiratory disorder

The bark and leaves of bombax ceiba are used in traditional medicine to treat respiratory disorders such as coughs bronchitis and asthma. They are often prepared as decoction or infusions for consumption [31].

### 1.5 Anti-microbial effect

Some studies have reported the antimicrobial properties of Bombax ceiba extracts against a range of pathogenic microorganisms, including bacteria and fungi. This property suggests its potential in the development of novel antimicrobial agents [19].

### 1.6 Anti-diabetic effect

There is evidence suggesting that extracts from Bombax ceiba may have hypoglycemic effects, making them potentially useful in managing diabetes. These effects may be attributed to the presence of bioactive compounds with insulin like properties. There is evidence to suggest that certain compounds founding Bombax ceiba may have antidiabetic effects, which could be explored for managing diabetes [18,23].

### 1.7 Anti-oxidant activity

Compounds present in Bombax ceiba have antioxidant properties, helping to neutralize harmful free radicals in the body and potentially reducing oxidative stress-related damage. Antioxidants are beneficial for overall health and can help prevent various diseases [17,25].

### 1.8 Anti-cancer potential

Preliminary studies have explored the anti-cancer potential of Bombax ceiba extracts, indicating cytotoxic effects against certain cancer cell lines. Further research is needed to elucidate the mechanisms and potential therapeutic applications in cancer treatment. Some studies have

investigated the anticancer potential of *Bombax ceiba* extracts, indicating possible cytotoxic effects against cancer cells [32,34].

## ETHNOBOTANICAL STUDIES

A tonic made of root is used to treat syphilis, while gum is used to treat menorrhagia and leucorrhoea. "Mocharas(juice)" is used for medical purposes, people use calyces flowers for prickles and veggies. The production of soups and lubricants involves the use of seed oil. (Small current report Resin has antidyseric Properties) Stem bark applied topically to treat pimples and boils. In chicken pox & small pox, Seeds are administered topically to the Skin, leaves have laxative and hemostatic Properties for rheumatism [16,21].

## CONCLUSION :

The red silk cotton tree is called *bombax Ceiba*, one of the significant medicinal trees found in tropical and Subtropical India, it Can also be found in Pakistan, Srilanka, Bangladesh, Indonesia, Malaysia, Sumatra, Java, Australia north. It's having lots of medicinal uses. Semaltrees can be used to treat diuretics dysenteric, emetic, diarrheal, wounds, ache, Pigmentation & skin blemishes cough & cold. *Bombax Ceiba* having different pharmacological activities like Anti-inflammatory, Anti-diabetic, Anti-obesity, Hypotensive, Antipyretic effect, Anti-microbial, Anti-oxidant activity, Respiratory Disorders. Till other part of plant such as gum, seed and seed oil which are document to possess important medicinal virtues are not explored scientifically for their biological potential. In this sense, more research is required to examine *bombax ceiba* potential for illness prevention and treatment.

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