



ORIGINAL RESEARCH PAPER

Botany

PHARMACOLOGICAL ATTRIBUTES OF BOMBAX CEIBA L.

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ABSTRACT

The plant *Bombax ceiba* L. is a light demander, fast-growing plant. It is used in the treatment of many diseases. Our ancestors had a great knowledge of this plant and used to treat various ailments without having any side effects and the knowledge of the same has been transferred down to generations. The plant has stimulant, astringent, cooling, anti-inflammatory, antimicrobial effect, etc. among many other health benefits.

I. INTRODUCTION

Bombax ceiba L. belongs to family Bombacaceae¹. The World Health Organisation (WHO) estimates that in developing countries 80% of the people depend on traditional medicine. About more than 20,000 species of medicinal plants are accepted by WHO and *Bombax ceiba* L. is among one of them.² It is known by different names in different parts of the world: Red silk-cotton tree, Silk-cotton or kapok.³ In India, also, it is known by different names in different languages: Salmali, Kantakdurma (Sanskrit), Semul or Semal (Hindi). The name *Bombax ceiba* L. is derived from two languages; *Bombax* is derived from Greek word, 'Bombyx' meaning silky hair surrounding the seeds; and *ceiba* is a vernacular name from America.⁴ The tree is found in almost all parts of the world like India, Pakistan, Sri-Lanka, Bangladesh, Myanmar, etc.^{5,6,7}

Description of Plant:

The tree is about 20-40 m tall with a tall, straight and rigid trunk. It is a multipurpose, deciduous tropical tree providing food, fodder, fuel, fiber, and medicine. The tree bears spike for protection against animals. The leaves are palatate, entire, lanceolate with about 6-7 leaflets radiating from a central point, an average of 7-10 cm in width and 13-15 cm in length. Flowers bloom from January to March and fruits from April to June. Flowers are pentamerous, small and white coloured having five anthers. Flowers are stiff and ornithophilous because of the presence of nectar with cup-shaped, thick and fleshy sepals. Its each and every part has medicinal value. Seeds are numerous, ovoid, black or grey coloured and covered with white silky cotton hair.^{8,9}



Fig. a: Bombax ceiba L Plant



Fig. b: Bombax ceiba L Flower

Phytochemical Constituents Present in Plants:

Phytochemicals are the chemical compound which occur in plants naturally and these are biologically active compounds. Their main role is to provide protection to plants against pathogenic attack and diseases. In addition to these they also provide colour, aroma and flavour.¹⁰

The principal constituents are tannin, glycosides, lupeol, β -sitosterol, alkaloids, saponins, palmitic acid, lactone, anthocyanin, isohemigossylic acid lactone-2-methyl ether, shamimicin, derivatives of naphthalene, hetricactone, hetricactanol, kaempferol, quercetin, guanosine, phytol, sesquiterpenoids. Amino acids like lysine, arginine, alanine, glutamic acid, leucine, lysine and sugar like fructose, glucose, galactose, sucrose, lactose is also present in different parts of the plant^{11,12,13,14}

I. USES:

Medicinal Uses

Its each and every part has medicinal properties and used for medicine since ancient time. In Charak Samhita, it is among the top ten drugs and used as static, bowel regulator, tissue regenerator, dysentery. In Sushruta Samhita, it is used in hemorrhagic disorder, wound healing, removing pimples, have cooling effect. In Ayurveda, it is explained that the plant has stimulant, astringent, hemostatic, aphrodisiac, diuretic, antidiarrheal, cardiogenic, emetic dermulent, anti-dysentery, antipyretic, impotency, abortifacient properties, diabetes, constipation, laxative.^{15,16,17,18} It has an anti-inflammatory, anti-diabetic, anti-oxidant, anti-angiogenic, anti-bacterial, anti-pyretic, hepatoprotective, analgesic activity.^{19,20}

Its each part and their medicinal properties are given below²¹:

Root- The root of the plant has anti-oxidant property and used in excess menstrual flow, to treat impotency, for treatment of piles, has diuretic property, used in treatment of male sterility disease.²²

Stem- Stem bark is used in healing wounds, as a paste in water for skin eruptions, boils, acne, pimples. Extract with curd used in treatment of dysentery with blood.

Leaves- Used in treatment of diarrhea, inflammation, larvicidal activity.

Flower- Flower has a bitter action and show acrid, cooling, dry, anti- inflammatory action. It removes bile, and shows good response in leucorrhoea.

Seed- Seeds are used in treatment of chickenpox, smallpox, genitourinary diseases.

Fruit- Fruits are used in treatment of leprosy, as a cooling agent, digestible, shows the diuretic property, anti- oxidant, expectorant, genital urinary organ, as a blood purifier. Young fruits are used in treatment of snake bite and in inflammatory diseases.²³

Gum- Gum is an acrid, astringent tonic and removes black bile. In powder form alone or with other herbs it is used to treat diarrhoea, dysentery, bleeding piles and blood disorder.²⁴

Therapeutic Uses^{1,18}

- Dried gum powder, mixed with water, is used for gynecological disorder.
- Powder of thorn mixed with milk is applied on acne or pimples.
- Paste of the root is taken along with water for the treatment of piles.
- Fresh paste of the bark mixed with cow dung helps to treat inflammation.

Anti-Diabetic Activity^{26,28}

Diabetes is a non-communicable disease which is growing day-by-day. It causes several major complications which can lead to organ failure, heart disease, etc. Each and every part of *Bombax ceiba* L. is used for the treatment of diabetes. It helps in the lowering of the blood glucose level. Presence of some phytochemicals like alkaloids, glycosides, flavonoids, etc. in the plant helps in the treatment of diabetes.

Hepatoprotective Activity^{26,27,28}

Due to changing life-style, there is an increase in various types of diseases, and hepatic disease is one of them. Jaundice, hepatitis, cancer, etc. are some of the liver disorders. *Bombax ceiba* L. is used from ancient times for the treatment of liver disorders and in recent time some experiments have confirmed it. Some phytosomes found in plants are used in the treatment of liver disorders.

Anti-Inflammatory Activity²⁹

Lupeol is a phytochemical found in *Bombax ceiba* L. which helps in the treatment of inflammation. Some tribes of India use *Bombax ceiba* L. to treat inflammation.

Anti-Cancer Activity^{29,30}

Cancer is one of the non-communicable diseases which is responsible for an increasingly large number of deaths worldwide. There are various types of cancer such as lung cancer, liver cancer, breast cancer, etc. Lupeol, one of the phytochemicals found in this plant, helps in the treatment of cancer.

Traditional Uses^{13,14}

Tribal people of India have a great knowledge about the usage of each and every part of almost all plants. Different tribes of different states of India use *Bombax ceiba* L. in treatment of many diseases. The Oraon tribe of West Bengal used the seed powder of *Bombax ceiba* L. of about 30 g along with about 10 g of Hing as an abortifacient. The tribes of southern Rajasthan give half cup of ethanolic extract of bark and flower for 3 days to both men and women for sexual disease like hydrocele, leucorrhoea, gonorrhoea and also to check menstrual disorder in women. The Kandha tribe of Orrisa used one teaspoon juice of fresh stem bark of *Bombax ceiba* L.,

one teaspoon juice of fresh root of *Asparagus racemosus*, powder of seven black peppers and one teaspoon of processed sugar or gum taken two times daily in empty stomach for 21 days for treating gonorrhoea, impotency, spermatorrhoea, sterility, nocturnal emission, and leucorrhoea. The Lohit community of Arunachal Pradesh use fresh paste of bark with cow dung for inflammation.

Commercial Uses³¹

The plant has commercial value as well:

- Floss is used for making pillows and cushions, because it is light, buoyant, soft, water repellent.
- Timber is used to make matchstick, plywood, packing cases, toys, coffins, artifact production, etc.
- Seed oil is used as illuminant and also for soap making.

Microbial disease spread very rapidly and causes death throughout the world and has become an international problem³². So, there is a need to find new sources of medicines which are developed from plants because these will be cheaper and safer and will have less or no side effect on humans. Microbial diseases like gastroenteritis, diarrhoea, dysentery can be cured by the plants^{33,34}.

Some fungi are important for human health while some are harmful and produce toxins. These causes fungal infections and skin infections and causes allergies and directly penetrate deep into the tissues. Keratinophilic fungi fractures the keratinized structures like skin, nail, and hair³⁵.

CONCLUSION:

Along with its huge Medicinal, Therapeutic and Traditional uses, the plant *Bombax ceiba* L. finds it use in many industries for its Commercial value as well. *Bombax ceiba* L. has been used since ancient times to harness all these uses.

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