

**Palash (*Butea monosperma* lam. Kuntze.): A Review**Neelam<sup>1\*</sup>, K.N. Dwivedi<sup>2</sup>, B.Ram<sup>3</sup><sup>1, 2, 3</sup>Deptt. of Dravyaguna, Faculty of Ayurveda, I.M.S., B.H.U., Varanasi, U.P. India**Abstract**

The traditional system of medicine together with folklore medicine continue to play a significant role in our health care system. *Palash* is a commonly used herb in *Ayurvedic* medicine. The botanical source of *Palash* is *Butea monosperma* Lam. Kuntze. It is a medium sized deciduous tree which is widely distributed throughout the greater part of India. *Palash* belongs to family Fabaceae and is popularly known as 'flame of the forest'. The plant is traditionally reported to possess astringent, bitter, alterative, aphrodisiac, anthelmintic, antibacterial and anti-asthmatic properties. Bark yield red juice known as 'Butea gum' or 'Bengalkino'. The widespread uses of *Palash* in traditional system of medicine have resulted in their extensive chemical analysis for their bioactive principles. This article briefly reviews the botany, chemistry and pharmacology of *Palash*.

**Keywords** Ayurveda, Palash, *Butea monosperma*, Fabaceae, Bengalkino**Greentree Group**Received 25/3/15 Accepted 28/4/15 Published 10/5/15

## INTRODUCTION

*Palash* (*Butea monosperma* Figure - 1) is commonly known as Flame of forest, belonging to the family Fabaceae. It is commonly found throughout the greater part of India, ascending the Himalayas up to 900m and in peninsular India up to 1, 200m. It is rare or absent in most arid regions. The tree is very typical of open grassland, where it is frequently gregarious as in the Terai in North India. It grows in waterlogged situations, on black cotton soils, even on saline, alkaline and swampy badly drained soils, and on barren lands <sup>[1]</sup>. The literary review of the *Palash* was started right from the *Vedas* up to recent research works to obtain thorough knowledge of drug. On comprehensive review of *Ayurvedic* classics it was found that *Palash* is described in *Vedas*, *Upanisads*, *Caraka Samhita*, *Susruta Samhita* and both *Astanga Sangraha* and *Astanga Hridaya*.

In *Caraka Samhita*, it is not described in *Mahakasaya*<sup>2</sup>. In *Susruta Samhita*, *Palash* is described in *Rodhradi*, *Muskakadi*, *Ambasthadi* and *Nyagrodhadi Gana*<sup>3</sup>. In *Astanga Hridaya*, *Vagbhata* mentioned *Palash* in *Asanadi gana* and like

*Susruta Samhita*, he has mentioned *Palash* in *Rodhradi*, *Muskakadi*, *Ambasthadi* and *Nyagrodhadi Gana*<sup>4</sup>. In *Astanga Sangraha*, *Vagbhata* mentioned *Palash* in *Asanadi*, *Rodhradi*, *Muskakadi*, *Ambasthadi* and *Nyagrodhadi Gana*<sup>5</sup>.

**Figure 1** Different parts of *Palasha Panchanga*



**1. Stem of Palash**



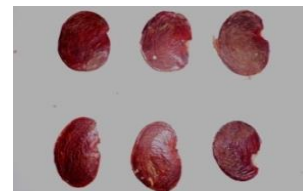
**2. Leaves of Palash**



**3. Flowers of Palash**



**4. Root of Palash**



**5. Seeds of Palash**

It is described in other *Samhita*'s like *Kasyapa Samhita*, *Bhela Samhita*, *Harita Samhita* and *Sharangadhar Samhita*. *Palash* is also mentioned in *Cikitsagranthas* like

*Cakradutta, Gadani-graha, Bhaishajya Ratnavali and Bhavaprakasha Samhita. Palash* is mentioned in *Nighantu* also. In *Nighantu*, the synonyms of *Palash* have been given. The synonyms of *Palash* which are found in most of the *Nighantu* are *Brahmavrksa, Kinshuka, Parna, Yajniya, Raktapuspa, Samidvara and Vatapotha etc.* Many of the *Nighantu* have described the properties of *Palash*. i. e., the *rasa* of *Palash* is *tikta* and *kasaya*, *Virya usna* but flower of *Palash* is *sita* in nature. The fruit is *Laghu, usna* and used in *Prameha, Arsha, Krmi* and *Vatakaphaja rogas* according to *Bhavaprakash Nighantu*<sup>6</sup> while in *Nighantu adarsh*<sup>7</sup>, the *rasa* of *Palash* is *katu, tikta, kasaya, virya- usna, vipaka -katu, Doshaghnta- Kaphavatanasaka*. The author of *Dhanvantari Nighantu* mentioned properties of *Palash Bija* as *Katu* in *rasa, Snigdha* in *guna, Usna virya* and *kaphanasaka*<sup>8</sup>.

### Scientific Classification<sup>9</sup>

Kingdom	:	Plantae
Division (Spermatophyta)	:	Magnoliophyta
Class (Dicotyledons)	:	Magnoliopsida
Order (Rosales)	:	Fabales
Family	:	Fabaceae

Genus	:	<i>Butea</i>
Species	:	<i>monosperma.</i>
<b>Vernacular names</b> <sup>10</sup>		
Hindi	:	Dhak, Tesu
English	:	Bastard teak, Bengal kino, Flame of the forest
Kannada Thoras	:	Muttunga,
Tamila	:	Parasa, Pilasu
Bengali	:	Palas
Gujarat Palaspappda	:	Khakharo,
Punjabi Dhak, Palas.	:	Chichra,

### Synonyms of *Palash*<sup>11</sup> -

- *Palash* – The leaves are fleshy and beautiful.
- *Kinshuka* - Resembling parrot's beak.
- *Ksharashrestha* - The plant is one of the best among the sources of alkali.
- *Parna* - The Leaves are useful.
- *Brahmavrksa* - Used in religious rites and sacrifices.
- *Yajniya* - Used in `religious rituals.
- *Raktapuspa* - Flowers are red.
- *Vatapotha* - It pacifies vata.
- *Samidvara* - As it is useful in Yajna.
- *Putadru*-It is sacred tree.
- *Kharaparna*- The leaves are rough to touch.

- *Tri Parna* - Trifoliolate leaves.
- *Bijasneha*- Seeds are oily.
- *Vakrapuspaka*- The flowers are curved.
- *Krmighna*- A potent antihelmintic drug.

## BOTANICAL DESCRIPTION OF *PALASH*

The genus *Butea* refers to beautiful appearance of flowers. The specific name **monosperma** means 'one seeded and refers to the fruit with a single seed near its apex'.

**Habit**- A medium sized erect tree 12-15 m high, with crooked trunk and irregular branches; bark rough, bluish grey or light brown.

**Leaves**- Three foliolate; petioles 10-15cm. long; stipules linear-lanceolate, deciduous.

Leaflets coriaceous, all obtuse, glabrous, above when old, finely silky and conspicuously reticulately veined beneath. Petioles-10-15cm long. Petiolules 6mm. long, stout. Stipels- subulate, deciduous.

**Flowers**- Large, in rigid racemes 15cm. long, three flowers together from the tumid nodes of the dark olive green velvety rachis, pedicels about twice as long as the calyx,

densely brown- velvety, bracts and bracteoles small, deciduous. Calyx 13 mm. long, dark olive-green, desely velvety outside, clothed with silky hairs within; teeth short, the 2 upper connate, the 3 lower equal, deltoid. Corolla 3.8-5 cm. long, clothed outside with silky silvery hairs, orange or salmon coloured; standard 2.5cm. broad; keel semicircular, beaked, veined.

**Pods** – stalked, 12.5-20 by 2.5-5 cm, thickened at sutures, reticulately veined, argenteo-canescens; stalked 2 cm. long.

**Seed** – oval, flat, smooth, brown, 1.5 inches long and 1 inch broad.

**Wood** – Wood grey and grey brown, soft, not durable, no annual rings, pores large, often subdivided, extremely ssacnty. Medullary rays broad and moderately broad pale, the darker tissue between the rays, is broken up into ablong patches by broad concentric bands of pale tissue similar in appearance to the medullary rays, alternating with dark patches, both distinctly visible on a radial surfaces as long, irregular, alternate dark and light bands.

**Flowering and Fruiting time**- The leaves begin to fall during Nov-Dec. and by the end of January the tree is leafless or nearly so. The new leaves appear in April or early

May. Flowering begins in January and continues till the end of April, according to the locality. The pods with a seed each at the apex ripen during May-June<sup>12</sup>.

## PHYTOCHEMICAL CONSTITUENTS OF PALASH

**Root-** Moisture 45.4; protein 2.1; fat 0.3; fibre 1.6; carbohydrates 50.0; and minerals 0.6g/100g; calcium 25; phosphorus 21mg/g; and energy 211Kcal/100g. Glycine, a glycoside and an aromatic hydroxyl compound are also present.

**Bark-** tannins 5.82%; and non-tannins 7.98% and colour.

**Leaf-** crude protein 14.79%; crude fiber 21.74%; ether extract 2.80%; minerals 6.68%; calcium 2.54%; and phosphorus 0.24%. The *in-vitro* dry-matter and cell-wall digestibility of the leaves was 53.20% and 34.46%, respectively. The leaves are also reported to contain alkaloids.

**Flower-** The flower contain butin, butein, butrin, isobutrin, palasitrin, coreopsin, isocoreopsin (butin-7-glucoside), sulphurein, monospermoside. The major glycoside of the flower is butrin. The bright colour of the flower is attributed to the presence of

chalcones and aurones. The aqueous extract of the flowers, containing mainly the chalcone, isobutrin, can be used for colouring of foodstuff in the yellow-orange range in place of synthetic coal-tar dyes currently in use.

**Seed-** Analysis of the seeds gave- moisture 5.7%; protein 20.1; pentosan 11.4; and water-sol mucilage 4.4%. The seeds contain up to 20% of a fatty oil known as Moodooga Oil or Kino-Tree oil.

The fresh seeds contain lipolytic and proteolytic enzymes. The latter is a mixture of plant proteinase and polypeptidase and behaves like 'Yeast trypsin'. The presence of three alkaloids one of which is identified as monospermine (1-N-acetyl-2-oxo-4-methoxy-3H, 5H-imidazole), a new lactone of n-heneicosanoic acid (yield, 0.24%; C<sub>21</sub>H<sub>40</sub>O<sub>2</sub>) and a phytolectin has been reported in the seeds. Palasonin is the anthelmintic principle present in the seeds (yield, 0.025-0.030%). The anthelmintic effect of palasonin is more pronounced than either piperazine or santonin against roundworm (*Ascaris lumbricoides* Linn.) in humans. It has been found to potentiate the stimulant action on different smooth muscles.

**Wood-** The destructive distillation of hardwood (moisture 10.8%) gave charcoal 33.9%; tar 7.0% and pyroligneous acid 36.6%. The pyroligneous acid on analysis gave: acid 3.28%; ester 2.84%; acetone 1.97%; and methanol 1.22%. The dry wood contains 3.1% ash.

**Gum-** The gum contains leucocyanidin, its tetramer, procyanidin, gallic acid and mucilaginous material. It is edible, rich in riboflavin (138.8 µg/g) and also contains thiamine (4.3 µg/g). On dry distillation it gives pyrocatechin<sup>13</sup>.

## MEDICINAL USES OF PALASH

**Root-** Roots are useful in elephantiasis, and in curing night blindness and other defects of sight. They are also reported to cause temporary sterility in women. The Root bark is used as an aphrodisiac and as analgesic and antihelmintic. It is also applied in sprue, piles, ulcers, tumors and dropsy. It yields a coarse fiber which is used for country brushes, cordage, slow matches and for caulking boats.

**Bark-** The bark is reported to possess astringent, bitter, pungent, alternative, aphrodisiac and anthelmintic properties. It is useful in tumors, bleeding piles and ulcers.

The decoction is prescribed in cold, cough, fever, various forms of hemorrhages, in menstrual disorders and in the preparation of tonic and elixirs. An alcoholic extract of the bark is reported to inhibit the activity of *Escherichia coli* and *Micrococcus pyogenes var. aureus*. A fraction, containing the sodium salt of phenolic constituents, isolated from the bark, has shown potential as an anti-asthmatic agent in experimental animals.

**Leaf-** The green leaves are commonly lopped for fodder; the yield of milk in buffaloes, fed with *Butea* leaves, is reported to improve. Their digestibility is comparable to that of straw; their caloric content is reported to be 3,761 cal/g dry wt. They are credited with astringent, tonic, diuretic and aphrodisiac properties. They are used to cure boils, pimples and timorous hemorrhoids and are internally in flatulent colic, worms and piles. The shoot apex is used by the 'Kani' tribal women of Kerala to prevent conception. The leaves are extensively used for platters, cups, native umbrellas and for wrapping. They are also used as *bidi* wrappers and as manure.

**Flower-** The flower are reported to possess astringent, diuretic, depurative, aphrodisiac and tonic properties; they are used as an

emmenagogue, and as poultice in Orchitis and to reduce swellings, for bruises and sprains. They are also effective in leprosy, leucorrhoea and gout. The petals are given to sheep for haematuria. They are active against the fungus *Helminthosporium sativum*. An alcoholic concentrate of the petals showed anti-estrogenic activity at a dose of 3.2 mg/kg body wt per day in mice. A decoction of the flowers is given in diarrhea and to puerperal women.

The flowers yield a brilliant, but very fugitive, yellow dye. It is contained in the sap and may be obtained in the form of a decoction or an infusion from dried flowers. The decoction is used to dye cotton fabrics, woolen carpets and to control white ants in the field. The powder of the flowers is used during *Holi*.

**Seed-** The seeds possess a faint odour, and taste slightly acrid and bitter. They are reported to possess aperients and rubefacient properties; they are sometimes substituted for santonin. A composite powder from the dried seeds of *B. monosperma*, *Embelia ribes* Burm.f. and *Mallotus philippensis* Muell-Arg was found to be effective in controlling the worm *Hymenolepis nana* (V.Siebold) in human intestine. However, the clinical use of seeds as an anthelmintic

drug in humans is not safe, as it may produce nephrotoxicity. The seeds are also used as vermifuge in veterinary medicine. The freshly powdered seeds give good results against *Ascaris* infection. Maggots are killed by sprinkling the powder over them. A paste of the powdered seeds with lemon-juices is applied as a cure for ringworm and herpes. The hot alcoholic extract of the seeds showed significant anti-implantation and anti-ovulatory activity in rats and rabbits, respectively; it also showed partial abortive activity in mice. A crude, saline extract (0.9%) of seeds agglutinates the erythrocytes of several animal species.

**Wood-** The wood is white when freshly cut, ageing rapidly to pale yellowish brown, frequently becoming grayish brown or grey from stain. It is lustrous when first exposed, especially on the radial surface, but soon becomes dull from stain; it has a rather rough feel. It is soft, light (wt, 545kg/m<sup>3</sup>), straight or somewhat cross-grained and extremely coarse-textured. It is not a strong timber. It is easy to work either by hand or on machine. Graveyard tests on the natural durability of the timber showed that the average life of the wood is less than 10 months. It is mainly used for well-curbs, water-scoops and rough packing-cases. It is

the source of charcoal used for gun powder. It can also be employed as a cheap board-wood. Sometimes it is used for structural work. The chief drawback which prevents more extensive use of the wood is the short length of logs and their irregular shape. It is a moderate fuel. It possesses decolorizing properties and can be used for purification purposes. The pulp obtained from a mixture of hardwoods containing the wood of *B. monosperma* is suitable for Braille printing paper and wrapping paper and can also be used for making newsprint.

**Gum-** A red juices exudes from natural cracks and also from artificial incisions in the bark. When fresh, the juice is ruby red and transparent. It dries to form a gum known as *BUTEA GUM* or *BENGAL KINO*. The fresh juice is applied to ulcers and in relaxed, congested and septic sore throat. The gum is a powerful astringent; it is given internally for diarrhea and dysentery, phthisis and hemorrhage from stomach and bladder; its infusion is occasionally employed as a local application in leucorrhoea. A solution of the gum is applied to bruises and erysipelatous inflammations and ringworm. The gum is reported to be often used as a substitute for or an adulterant of genuine gum Kino of

commerce obtained from *Pterocarpus marsupium* Roxb. The gum is also used for dyeing and tanning<sup>14</sup>.

## CONCLUSION

From the time immemorial, plants have been used as curative agent for variety of ailments. Herbs are the natural drugs used to regain the alterations made in normal physiological system by foreign organisms or by any malfunctioning of the body. In every ethnic group there exists a traditional health care system, which is culturally patterned. In rural communities, health care seems to be the first and foremost line of defense. It is very essential to have a proper documentation of medicinal plants and to know their potential for the improvement of health and hygiene through an eco friendly system. Thus importance should be given to the potentiality of ethnomedicinal studies as these can provide a very effective strategy for the discovery of useful medicinally active identity. A detailed and systematic study is required for identification, cataloguing and documentation of plants, which may provide a meaningful way for the promotion of the traditional knowledge of the herbal medicinal plants. The present review reveals that the plant *B.monosprema* is used in treating various ailments. Wherein



a detailed research work in the characterization and standardization is utmost required for this potential plant for developing its various formulations, which can ultimately be beneficial for human beings as well as animals. However, various studies are carried out, and authenticated comparative study will explore much depth about this plant used in the name “Flame of the forest”.

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