

A Review on Medicinal Value of Flame of The Forest (*Butea monosperma*)

Dixshali¹, Reena Sharma²

¹Student, Division Biosciences, University Institute of Biotechnology, Chandigarh University, District Mohali, Punjab, India-140413

²Faculty, Division Biosciences, University Institute of Biotechnology, Chandigarh University, District Mohali, Punjab, India-140413

Corresponding author: Dixshali, ¹Student, Division Biosciences, University Institute of Biotechnology, Chandigarh University, District Mohali, Punjab, India-140413, dixshali870@gmail.com

ABSTRACT

Flame of the forest is a famous name of a medicinal plant called *Butea monosperma*. It belongs to family *Fabaceae*. There are 630 types of genera and 18,000 types of species come under family *Fabaceae*. It is a medium-sized tree. Some of other common names are palash, dhak, khakhro, etc. It is a traditional medicinal plant and plays a major role in ayurvedic system of medicines having both economical as well as medicinal value. The main properties this plant possess are such as anti-inflammation, anti-fungal, anti-stress and anti-fertility, etc. This review paper aims to compile and document the information on different aspect such as the Pharmacological, chemical composition and economical values of this plant to increase our knowledge. Hope this paper will surely give new directions to the pharmaceutical industries in developing a new drug.

Keywords: *Butea monosperma*; forest; palash; medicinal uses; ayurvedic; *Fabaceae*.

INTRODUCTION

Butea monosperma (Lam.) is famous for its name “Flame of the Forest” because of its flowers. Some of the other common names are Palash and Kimsukain Sanskrit, Bastard teak in English, Dhak, Palas and Tesu in Hindi, Khakhra in Gujarati, Modugo in Telugu and Mutag in Kannada. It is mainly found in Ahmedabad, tropical-Asia, etc. It is 15-16m tall, grow in dry- season and is a deciduous type tree, belonging to the family *Fabaceae*. For its various medicinal value, it is extensively used in Ayurveda, homeopathic and Unani medicines and behave as a treasure for today’s modern system of medicine. Its flowers and barks are used by Acharaya Charak and Shushruth to prepare various medicines. This tree is the form of the Agni Dev (the god of fire)[1]. Its flowers are odourless and look reddish in the flowering season during springs and leaves are trifoliate. In history holi colour’s are prepared by its flowers i.e. festival of colour in India. Coloured prepared from flowers is natural, good for skin and has no any adverse effect [2]. It can be cultivated in both irrigated and dry lands.

The leaves of this plant shows its own importance like disposable cups are made from them and used in some festival’s and marriage for eating food in many states, also used for biddies manufacturing by wrapping tobacco leaf. Good quality of charcoal is obtained from butea. Various parts of this plant plays important role in traditional system of medicines to treat different disease like night blindness, inflammation, anorexia, elephantiasis, constipation, gonorrhoea, burning urine etc. [3,5]. Kamarkas is the Hindi name of this tree’s gum used to prepare some food dishes. It is also known as Bengal’s Kino. Due to astringent qualities, it has valuable-importance said by druggist. This plant is useful in production of natural lac, because its flowers are used as an insecticides and colouring agent [4]. The main constituents of this plant are butrin, butein, butin, terpinines such as lupeol and lupenone. This plant also contains flavonoids and steroids. Applying Palash leaf paste on the skin helps in managing skin inflammatory properties. Palash decoction can also be used to wash pubic areas in case of vaginal infections and urinary problems due to its antifungal and antimicrobial properties. It also promotes diuresis and menstrual flow.

BOTANICAL CLASSIFICATION OF *Butea monosperma*

Kingdom: Plantae
Clade: Angiosperms
Order: Fabales

Family: Fabaceae
Genus: Butea
Species: *B. monosperma*

MORPHOLOGY

It is deciduous type of tree and grow up to medium height 15-20 feet, and on trunk there is grey bark is present. Its surface is rough and irregular branches are present. Black cotton soil, water, saline and drought toleration like suitable environment is needed to grow.

- (1) **Leaves:** Its leaves are of size 15-20 cm, with three leaflets, compound type, elliptic. Its leaves start shedding off in Nov and Dec and completely shed off up to Jan. New leaves start to appear in the month of April and starting of May. When the plant is young, petiole is cylindrical, thick and slender at the base. [2].
- (2) **Flower:** Flower is of two colours, yellow and bright orange red. The diameter of the size is nearly 2-5 cm. Beautiful canopy is formed by its beautiful yellow and orange red colour flowers. In the month of February they start to appear and remain up to April end.
- (3) **Bark:** Fibrous type of bark having colour light grey to light shade of brown. [3].
- (4) **Fruit:** Fruit is flat legume. Young pods possess lot of hair, velvet cortex and mature pods hang down.
- (5) **Seed:** Single seed with two big cotyledons is present in a fruit. They are brown in colour and very useful for disorders of eye and skin problems.
- (6) **Root:** There is tap root system is present. Long, thick and developed very well also very useful in many medicines.

CHEMICAL CONSTITUENTS

- 1) **Flower:** The main chemical constituents are several flavonoids butrin, butein, flavonoids, steroids, sulphurein, monospermoside, chalcones, aurones, stearic, palmitic, myricyl alcohol, aspartic acid, fructose, glucose, alanine and phenylalanine.
- 2) **Bark:** Kino-tanic acid, Galic acid, pyrocatechin. It also contains butolic acid, major glycosides as butin, alanin, lupeol, miroestrol, palasimide acid and shelloic acid.
- 3) **Seed:** Oil (yellow, tasteless), fatty acid, Arachidic acid and behenic acid. [4].
- 4) **Leaves:** Leaves contain linoleic acid, palamitic acid, lignoceric acid, and glucoside.
- 5) **Stem:** It contains purgative, anthelmintic and tonic compounds.
- 6) **Root:** It contains glycine, glucose, glycoside and an aromatic hydroxyl compound [6].
- 7) **Resin:** Sucrose, esters, glycoside, lactone acid.
- 8) **Gum:** Tannins, mucilaginous material, pyrocatechin.

MEDICINAL VALUE

The plant *Butea monosperma* has so many medicinal values which are as follows:

Table 1:

| Parts | Medicinal value | References |
|--------|---|------------|
| Root | <ul style="list-style-type: none"> • Its roots are very effectively used for the disease name night blindness and elephantiasis. • Its taste is tart like, has anthelmintic properties and also causes temporary sterility in women. | [5,6] |
| Stem | <ul style="list-style-type: none"> • Stem has antifungal properties. • It is used to treat dyspepsia and sore throat. | [7] |
| Leaf | <ul style="list-style-type: none"> • It has anti-filarial, anti-diabetic, antifungal, antioxidant and anti-inflammation properties. • It is good for skin problems like pimples, diseases of eye. • Used as a strong astringent. | [8] |
| Flower | <ul style="list-style-type: none"> • Flowers are sweet or bitter in taste. • It has anti-cancer, Anti-inflammatory, antioxidant and anticonvulsant properties. • It also cures diarrhoea and diuretic. | [9,10] |

| | | |
|-------------|--|------|
| Seed | <ul style="list-style-type: none"> • Seeds are dry, digestible and aperients. • It is used in treatment of intestinal worms. • It has hormone balancing effect, antifertility effect, anthelmintic effect, anti-stress properties. | [11] |
| Bark | <ul style="list-style-type: none"> • Bark is acrid, bitter, oily appetizer, laxative and aphrodisiac. • It is useful to treat broken bones, anus related disorders, dysenteric problem, piles, treat ulcers and tumours. • It has anti-stress, antifungal, antidiarrheal, antiulcer, anti-inflammatory, and oestrogenic properties. | [12] |
| Gum | <ul style="list-style-type: none"> • Gum is astringent to the bowels, ringworm and septic sore throat. • It shows positive results to cure leucorrhoea, diarrhoea, Basu, cough, dysentery and has anti-microbial properties. • In Hindi it is known as Kamarkas which is used to cook dishes. | [13] |

PHARMACOLOGICAL ACTIVITY

Anti-Inflammatory Activity

The bark, flower, leaves of palash contain anti-inflammation property, show positive effect in albino rat to cure granuloma. In carrageenan induced paw edema, by 26 and 35% and in cotton pellet granuloma inhibition of granuloma tissue formation [14]. At some doses, MEBM was found effective in reducing the granuloma tissue formation.

Antifungal Activity

The bark, stem and leaves of this plant has anti-fungal activity. Fungal entophytes were isolated from the inner bark segments of ethno-pharmaceutically important medicinal tree *Butea monosperma* [27]. The ethyl acetate and petroleum extracts of this plant show the antifungal activity against *Cladosporium cladosporioide*. Medicarpin is the chemical constituent that was responsible for its antifungal activity. Its antifungal activity was found to be greater than Benlate [28].

Anti-Microbial Activity

Gum of this plant has anti-microbial properties and used to treat microbial infection. Alcoholic is extracting from its gum and show in-vitro anti-microbial activity. Its seed oil also show importance microbial and bacterial effect in laboratory testing [15].

Anti-Diabetic Property

Ethanol extract from palash causes the reduction of blood sugar level in the rats suffering from diabetes. Oral treatment can be done in 14 days, this herbal drug can result in the reduction of blood glucose level, serum cholesterol and improve high density lipoprotein. [5,16].

Anti-Stress Activity

The seed and bark of *Butea monosperma* has anti-stress activity. The ethanolic extract from its parts found useful to reduce water immersion stress and induce high concentration of serotonin and plasma cortico-steroidal hormone [26].

Disorders of Liver

Substance from flowers treat disorders of liver. From this substance isobutrin and butrin are two anti-hepatotoxic flavonoids. It also contributes to chemo-preventive effect, suggested by the two doses of methanolic extract during TAA treatment. It shows significant recovery of liver which is infected by detoxifying enzyme [22].

Wound Healing Activity

The stem bark show increase rate of wound contraction and epithelisation and increase granuloma tissue formation. Cutaneous wound healing in rats is done by its alcoholic bark extract. The extract increase collagen synthesis and cellular proliferation at the wound site, some of the evidences are DNA increase, total amount of protein and collagen of granulation tissues. Wound's are treated faster with the extraction in comparison of other medicines [29].

Anti-Helminthic Activity

The seeds of this plant possess anti-helminthic activity. In Ayurvedic system of medicine the seeds of the plants are used as anti-helminthic drug. In sheep the crude power of seed of the plant shows a dose-dependent and time-dependent anti-helminthic activity. Parasitic worms are eradicated from the gastro-intestinal tract [30].

Anti-Estrogenic and Anti-Fertility activity

Substance extract from flower is alcoholic and has anti-estrogenic activity. Alcoholic extract of seed also shows anti-ovulatory and anti-implantation activities in rabbit and rats. In mice anti-fertility effect has been reported due to *Butea monosperma* seed extract. Buteaspein A, B and buleaspermanol are three compounds, isolated with 19 known compounds and identified by the bark of stem [18].

Giardiasis

Giardia lamblia, a protozoa parasite causes gastrointestinal infection called giardiasis is treated intestinal by the ayurvedic herbal medicine prepared from piper longum. From the flowers, stem's ash, root and leaves of palash it can be prepared. This medicine produces 98% recovery rate from the infection. Treatment of leprosy and leucorrhoea with the flower of this plant was found effective [16,17].

Anti-Oxidant Activity

Its leaf shows anti-oxidant values. Damage of liver cell is prevented by the scavenges free radicals of Glutathione. Glutathione is increased by anti-hepatotoxic flavonoids, butrin and isobutrin [19].

ECONOMIC VALUE

The economical uses of *Butea monosperma* many. It behave as host of a lac insect, which produce Rangini lac. It is highly cultivated in Bihar, West Bengal and some other states. [20]. Some of the raw materials like newsprint are being produced by its species. Disposable plates and cups of its leaves are used in festival's and marriage for eating food [21]. Its leaves are also used as a source of food for animals like cow and buffalo [22]. Cotton fabric are being dyed from its yellow and orange-red flowers [23,24]. Seeds used as insect repellent for elephants and horse. The seed and flower extract have contraceptive values. Its bark give's brown fibres which is also useful for many purposes. The wood of this plant is sold in cheap price so used in many works. Roots are used as an antidote [25].

CONCLUSION

This review paper attempts to provide the medicinal values of *Butea monosperma*. The plant plays an important role in ayurvedic system of medicine. Different aspects of this plant has been depicted in this paper such as pharmacological activities, chemical composition of plant T, medicinal values of different parts and its botanical classification. The plant has a good potential of medicinal values against different diseases such as skin diseases, Giardiasis and jaundice [29]. The plant provides good approach to the scientists to produce efficient, cheap and safe medicines. It is easily available throughout India. The cultivation of this plant is also very simple.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

REFERENCES

- [1]. D. Fageria and D. V. Rao, A review on Butea monosperma (Lam.) Kuntze: A great therapeutic valuable leguminous plant (*International journal of Scientific and Research Publication*, 2015), pp.1-7.
- [2]. D. Jhade, D. Ahirwar, N. K. Sharma, R. Jain, and S. Gupta, Butea monosperma (Lam.) Taubert: A review (*Journal of pharmacy research*, 2009), pp. 1-4.
- [3]. V. Kore, S. K. Kemble, S. S. Mali and S. S. Megdum, A traditional medicinal plant Butea monosperma: A review (*European journal of pharmaceutical and medical research*, 2020), pp.258-259.
- [4]. R. S. Pawar, V. D. Kulkarni and R. R. Kudale, Pharmacological profile of palash (Butea monosperma Lam.): A review (*International journal of ayush*, 2019), pp.36-43.
- [5]. P. Gupta, N. S. Chauhan, M. Pande and A. Pathak, Phytochemical and pharmacological review on Butea monosperma (Palash) (*International journal of agronomy and plant production*, 2012), pp.255-258.
- [6]. G. Patel, N. Dwivedi and P. Tripathi, Bio-chemical studies of Butea monosperma (Palash) (*International journal of current research*, 2017), pp.45965-45968.
- [7]. S. V. Hegde, G. R. Hegde, S. Mannur, and S. S. Poti, Pharmacognostical studies on Butea monosperma (Lam.) Taub (Fabaceae) flower (*International journal of pharmaceutical and phytopharmacological research*, 2014), pp.34-36.
- [8]. A. Mishra, S. Verma, and A. P. Mishra, A plant review: Butea monosperma (Lam.) Kuntze (*Research journal of pharmaceutical, biological and chemical science*, 2012), pp.700-710.
- [9]. P. Tiwari, S. Jena, and P. K. Sahu, Butea monosperma: phytochemistry and pharmacology (*Acta scientific pharmaceutical sciences*, 2014), pp.19-26.
- [10]. M. V. Patel, S. Pawar, and D. A. Patil, Ethno-botany of Butea monosperma (Lam.) Kuntze in North Maharashtra, India (*Natural product radiance*, 2005), pp.323-325.

- [11]. R. K. Verma, A taxonomical review of *Butea monosperma* (Lam.) Kuntze-a dye yielding plant (*World journal of pharmaceutical research*,2017), pp.284-295.
- [12]. V. R. Sindhia, and R. Bairwa, Plant review: *Butea monosperma* (*International journal of pharmaceutical and chemical research*, 2010), pp.90-94.
- [13]. S. S. Chauhan, and P. K. Mahish, Flavonoids of the flame of forest-*Butea monosperma* (*Research journal of pharmacy and technology*, 2020), pp.65-67.
- [14]. M. Tuppada, Evaluation of antibacterial and antioxidant activity of *Butea monosperma* (*World journal of pharmaceutical and clinical research*,2018), pp.90-94.
- [15]. N. Vasudeva, G. Rai, and S. K. Sharma, Anti-spermatogenic activity of *Butea monosperma* (Lam.) Kuntze root (*Asian journal of biological science*,2011), pp.591-600.
- [16]. F. Rana, and M. Avijit, Review on *Butea monosperma* (*International journal of research in pharmacy and chemistry*, 2012), pp.1035-1039.
- [17]. A. Vaidya, and N. Pandita, Comparative pharmacognostic and phytochemical studies of flower, stem and leaf extract of *Butea monosperma* (*Asian journal of biomedical and pharmaceutical sciences*, 2017), pp.1-15.
- [18]. B. Subramanian, N. Polachi, and G. Mathan, Isocoreopsin: An active constituent of n-butanol extract of *Butea monosperma* flowers against colorectal cancer (CRC) (*Journal of pharmaceutical analysis*,2016), pp.318-325.
- [19]. G. S. Kumar, Ethnobotany of *Butea monosperma* (LAM.) Kuntze (*International Journal of science and research*,2015), pp.333-334.
- [20]. S. More, M. V. Jadhav and V. Kadam, A comprehensive review on *Butea monosperma*: a valuable traditional plant (*International journal of botany studies*, 2018), pp. 65-71.
- [21]. D. A. Burli, and A. B. Khade, Phcog Rev: Plant reviews a comprehensive review on *butea monosperma* (Lam.) (*Pharmacognosy reviews*,2007), pp.333-337.
- [22]. A. Gupta, A and S. Singh, A review on pharmacognostic study of *butea monosperma*. *Review article*, 2017), pp.196-199.
- [23]. S. Kumar, Pharmacognostical, phytochemical and pharmacological studies of leaves of *butea monosperma* toub (*International journal of botany studies*, 2009), pp.1-88.
- [24]. M. Kumar, V. Kaur, and P. Kaur, Inhibitory Activities of butanol fraction from *butea monosperma* (Lam.) (*Chemistry and biodiversity*, 2017), pp.34-67.
- [25]. R. Kumari, Phytochemical screening and in-vitro antimicrobial activity of *Butea monosperma* (*International journal of pharmaceutical science and research*,2005), pp.65-77.
- [26]. G. Poornachandar, and V. Devi, Antibacterial activity of leaf and flower extracts of *butea monosperma* (Lam.) (*Indo American Journal of pharmaceutical sciences*,2014), pp.51-58.
- [27]. S. Kumar, M. Thomas, and N. Lal, Effect of nutrition in palash on the survivability of lac insect (*The pharma innovation*, 2017), pp.320-324.
- [28]. S. K. Goswami, Erectogenic and Aphrodisiac effect of *butea monosperma* (*International research article*, 2013).
- [29]. A. Jain, and J. Sahu, *Butea monosperma*: the palash – a versatile tree full of virtues (*Research journal of pharmacognosy and phytochemistry*, 2010), pp.7-11.
- [30]. R. Tandon, and H. Y. Ram, Reproductive biology of *butea monosperma* (*Annals of botany*,2003), pp.715-723.